Site Management Plan

275 Franklin Street Site, BCP Site No. C915208
and
432 Pearl Street Site, BCP Site No. C915237

Buffalo, New York

July 2017 0156-016-002

Prepared For:

Buffalo Development Corporation
Buffalo, New York

Prepared By:

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BROWNFIELD CLEANUP PROGRAM

SITE MANAGEMENT PLAN

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AND
432 PEARL STREET SITE NO. C915237
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Prepared for:
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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

SITE MANAGEMENT PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES

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APPENDICES

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 Introduction

This document is required as an element of the remedial program at the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) Sites referred to as the 275 Franklin Street Site and 432 Pearl Street Site (hereinafter referred to as the "BCP Sites" or "Sites"). The Sites were remediated in accordance with Brownfield Cleanup Agreement (BCA) Index Nos. B9-0722-06-07 (275 Franklin Street Site) executed in October 2006 and C915237-10-10 (432 Pearl Street Site) executed in May 2011.

1.1.1 General

Buffalo Development Corporation (BDC) entered into two BCAs with the NYSDEC to remediate a total of approximately 0.97 acres of property located in Buffalo, Erie County, New York. These BCAs required the Remedial Party, BDC, to investigate and remediate contaminated media at the BCP Sites. Figure 1 shows the location and boundaries of the BCP Sites. The boundaries of the Sites are more fully described in the metes and bounds Site descriptions that are part of the Environmental Easements contained in Appendix A.

After completion of the remedial work described in the July 2013 Remedial Investigation/Alternatives Analysis/Interim Remedial Measures (RI/AA/IRM) Report, some contamination was left in the subsurface at these Sites, which is hereafter referred to as "remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at these Sites until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. All reports associated with these BCP Sites can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by Benchmark Environmental Engineering & Science, PLLC (Benchmark) on behalf of BDC in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) that are required by the Environmental Easement for these Sites.

1.1.2 Purpose

The Sites contain contamination left after completion of the remedial action. Engineering Controls have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Sites to ensure protection of public health and the environment. Environmental Easements granted to the NYSDEC, and recorded with the Erie County Clerk, require compliance with this SMP and all ECs and ICs placed on the Sites. The ICs place restrictions on Site use, and mandate operation, maintenance, monitoring, and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easements for contamination that remains at the Sites. This SMP has been approved by the NYSDEC, and compliance with this SMP is required by the grantor of the Environmental Easements and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the Sites after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports (PRRs); and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems.

This Plan also includes a description of PRRs for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easements. Failure to properly implement the SMP is a violation of these documents, which is grounds for revocation of the release of liability;

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375, and the BCAs (Index Nos. B9-0722-06-07 and C915237-10-10) for the Sites, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this Plan will be proposed in writing to the NYSDEC's project manager. In accordance with the Environmental Easements for the Sites, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.2 Site Background

1.2.1 Site Location and Description

BDC owns the four adjoining parcels that are part of a common proposed redevelopment project. The properties are collectively referred to throughout this document as the BCP Sites (see Figures 1 and 2) and are identified as follows:

- BCP Site No. C915208, identified as the 275 Franklin Street Site and encompassing the following parcels:
  - Parcel 111.38-2-22, addressed as 275-277 Franklin Street, (± 0.14 acres)
  - Parcel 111.38-2-23, addressed as 279 Franklin Street, (± 0.13 acres)
- BCP Site No. C915237, identified as the 432 Pearl Street Site and encompassing the following parcels:
  - Parcel 111.38-2-20.1, addressed as 267 Franklin Street, (± 0.25 acres)
  - Parcel 111.38-2-4.1, addressed as 432 Pearl Street, (± 0.45 acres)

As shown on Figure 2, the Sites are improved with an apartment building and parking lots. The BCP Sites are bounded by a restaurant and surface parking lot to the north; Pearl Street to the east; a mixed use building to the south; and Franklin Street to the west. The boundaries of the Site are fully described in Appendix A.

1.2.2 Regulatory History

In June 2006, BDC submitted a New York State BCP application for entry of 275-277 Franklin Street, 279 Franklin Street, and 432 Pearl Street into the BCP. On October 4,

2006, NYSDEC accepted 275-277 Franklin Street and 279 Franklin Street into the BCP, but denied the entrance of 432 Pearl Street stating that this parcel did "not meet the definition of 'Brownfield site' as set forth in Section 27-1405.2 of the Environmental Conservation Law (ECL)." BDC executed a BCA as a non-responsible party (volunteer) per ECL§27-1405 for the 275 Franklin Street Site (BCP Site Number C915208).

In November 2006, remedial investigation work was conducted on the 275 Franklin Street BCP Site and adjacent parcels that are now part of the 432 Pearl Street BCP Site. The data collected on the parcels addressed as 267 Franklin and 432 Pearl Streets identified actual contamination on 267 Franklin and 432 Pearl Streets that the Applicant perceived as complicating redevelopment of the parcels. Based on the new data and a better understanding of the properties, the Applicant submitted an amended BCP application in June 2007 to include 267 Franklin and 432 Pearl Streets.

On December 21, 2007, the 267 Franklin Street and 432 Pearl Street properties were incorporated into the 432 Pearl Street Site under BCP Site Number C915237.

1.2.3 Site History

The BCP Sites have been used for various purposes since the late 1800s. From at least 1951 through the early 2000s, 275-277 Franklin Street was used as a dry cleaner. The property located at 279 Franklin Street was used for residential purposes from the late 1800s through at least 1951, and was a parking lot from at least 1981 to the present (Ref. 1). In 1925, the 432 Pearl Street Site was used for residential and hot air heater manufacturing and by 1951 it was being used as residential and a parking lot. The property at 267 Franklin Street (part of the 432 Pearl Street Site) has been used as an apartment building since at least 1925.

Copies of the reports referenced in this section have been previously submitted to the NYSDEC and are therefore not repeated in their entirety. A comprehensive summary of these investigations is presented in Section 1.2 of the Remedial Investigation/Alternatives Analysis/Interim Remedial Measures (RI/AA/IRM) Report submitted to the NYSDEC in July 2013 (Ref. 2). The summaries presented herein are intended to provide a brief overview of the progressive investigative history of the Site.

In September 2004, a Limited Environmental Investigation was performed at 275-277 Franklin Street by Nature's Way Environmental Consultants & Contractors, Inc. (Ref.

3). The results of that investigation indicated that the 275 Franklin Street Site soils and groundwater were impacted by tetrachloroethene (PCE), a chlorinated volatile organic compound (cVOC) typically associated with dry cleaning operations.

In March-June 2006, Benchmark performed a Preliminary Site Investigation at the BCP Sites (Refs. 4 and 5). The Preliminary Site Investigation was performed to assess soil/fill materials and soil vapor on-site, and to ascertain if subsurface environmental conditions on these parcels were likely to impact redevelopment of the BCP Sites. The results of the investigation indicated that the 275 Franklin Street Site soils had been impacted by semi-volatile organic compounds (SVOCs), mercury, and lead. In addition, soil vapor samples collected from both BCP Sites contained elevated concentrations of cVOCs. Field screening of soil samples using a photoionization detector (PID) did not indicate VOC concentrations above background concentrations.

1.2.4 Geologic and Hydrogeologic Conditions

The BCP Sites encompass approximately 0.97 acres comprised of four parcels in the City of Buffalo, New York (see Figure 2). Due to the proximity of the BCP Sites, the Site features are discussed collectively below. Three of the parcels are used as commercial surface parking lots covered by asphalt. There is an occupied apartment building located on approximately half of 267 Franklin Street (southern portion of the 432 Pearl Street Site) with the remainder of that parcel existing as surface parking.

1.2.4.1 Overburden Soils

The BCP Sites are located within the Erie-Ontario lake plain physiographic province, which is typified by little topographic relief and gentle slope toward Lake Erie, except in the immediate vicinity of major drainage ways (Ref. 6). The surficial geology of the Lake Erie Plain generally consists of a thin glacial till (if present), glaciolacustrine deposits, recent alluvium, and the soils derived from these deposits. Glacial till deposits were not encountered at the BCP Sites. Glaciolacustrine deposits are characterized as thinly bedded to laminated silts and clays, which were deposited in lakes impounded between glacial ice and ice-free highland areas. As the glacial ice retreated northward in Erie County, water depths decreased and coarser grained shallow water sediments were deposited. These shallow water deposits included sandy beach ridges that defined lake edges, sand bars associated with

offshore currents, and near shore silty fine sands. These sands exist below soil/fill at the BCP Sites.

Surface soils within the City are characterized as urban land with level to gently sloping land in which 80 percent or more of the soil surface is covered by asphalt, concrete, buildings, or other impervious structures (Ref. 6) typical of an urban environment. The presence of overburden fill material is widespread and common throughout the City of Buffalo. The BCP Sites overburden soils have been described as soil/fill to approximately 2- to 5-feet below ground surface (fbgs) overlying native glaciolacustrine sand and silt with intermittent silty clay lenses. The U.S. Department of Agriculture Soil Conservation Service soil survey map of Erie County (Ref. 6) describes the general soil type at the BCP Sites as urban land.

Field characterization confirms the presence of soil/fill over much of the BCP Sites with sandy beach ridge deposits underlying the fill with intermittent silty clay lenses.

1.2.4.2 Bedrock

Based on the bedrock geologic map of Erie County (Refs. 14 and 15), the BCP Sites are situated over Onondaga Formation of the Middle Devonian Series. The Onondaga Formation is comprised of a varying texture from coarse to very finely crystalline with a dark gray to tan color and chert and fossils within. The unit has an approximated thickness of 110 to 160 feet. Structurally, the bedrock formations strike in an east-west direction and exhibit a regional dip that approximates 40 feet per mile (3 to 5 degrees) toward the south and southwest. As a result of this dip, the older Onondaga limestone outcrops or subcrops north of the Hamilton Group (Ref. 7). An intersecting, orthogonal pattern of fractures and joint sets are common throughout the bedrock strata (Ref. 7). The surficial geomorphology of the bedrock strata was modified by period sub-aerial erosion and continental glaciation (Ref. 7).

Bedrock below the BCP Sites was encountered at approximately 52.5 fbgs at soil boring locations MW-1, MW-4, and MW-6 during investigation drilling activities.

1.2.4.3 Hydrogeology

Unconfined groundwater was encountered at the BCP Sites within the native fine sand soil unit at depths of approximately 10 to 12 fbgs. Figure 3 presents a shallow groundwater isopotential map prepared from the most recent groundwater monitoring event in September 2014. Water level measurements were obtained from on-site groundwater

monitoring wells and piezometers as well as off-site NYSDEC wells MW-23S and MW-24S during the June 2014 post-IRM groundwater monitoring event (see Section 5.0). Based on groundwater elevation data, groundwater at the BCP Sites flows south-southwest with a more southerly off-site component south of the BCP Sites. The measured gradient across the BCP Sites averages 0.005 feet/feet based on the isopotential map. This low gradient is typical of an unconfined water table aquifer. Regional groundwater appears to flow west/southwest toward Lake Erie and the mouth of the Niagara River.

Hydraulic conductivity testing of the aquifer was conducted via slug testing in intermediate overburden monitoring wells MW-1, MW-2, and MW-3. The average hydraulic conductivity was estimated at 6.4 x 10^{-4} centimeters per second (cm/sec) using the Bouwer and Rice Method (Ref. 8). Average linear velocity of groundwater at the BCP Sites was estimated at 1.1 x 10^{-5} cm/sec or 3.1 x 10^{-2} feet per day (ft/day) assuming an effective porosity of 0.35 and an average hydraulic gradient of 0.005 feet/feet.

1.3 Summary of Remedial Investigation Findings

A Remedial Investigation (RI) was performed to characterize the nature and extent of contamination at the Site. The results of the RI are described in detail in the following report:

- Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC. *Brownfield Cleanup Program Remedial Investigation/ Alternatives Analysis/Interim Remedial Report, 275 Franklin Street & 432 Pearl Street Sites, BCP Site No. C915208 & C915237, Buffalo, New York*. Revised July 2013.

RI activities summarized in this report include sampling locations on both BCP Sites (see Figure 4). RI activities were completed in November 2006, December 2006, and January 2007 in accordance with the NYSDEC-approved RI Work Plan dated July 2006 (Ref. 9) and an October 16, 2006 Response to Comment Letter (Ref. 10). In April 2008, a supplemental RI was performed in accordance with the NYSDEC-approved Supplemental RI Work Plan dated March 5, 2008 (Ref. 11), in order to fill in data gaps and investigate the quality of deeper groundwater on the BCP Sites.

Based on the pre-IRM data collected during historic investigations, the NYSDEC-approved RI, Supplemental RI, and NYSDEC off-site investigations (Ref. 12), below is a summary of Site conditions.

1.3.1 Soil/Fill

The following summary of soil/fill sampling results pertains to pre-IRM data collected during historic investigations (2004), the NYSDEC-approved RI (2006-2007), Supplemental RI (2008), and NYSDEC off-site investigations (2009; Ref. 12). Tables 1a and 1b summarizes the soil analytical results from these on-site investigations. Post-IRM soil sampling results are discussed in Section 1.4.1. Discussion of the soil/fill sampling results is limited to the restricted-residential SCOs (RRSCOs) based on the current and reasonably anticipated future use of the Sites:

- Concentrations of pesticides, PCBs, and metals in subsurface soil were below Part 375 RRSCOs on the 275 Franklin Street Site.
- Concentrations of PCE were detected above RRSCOs on the 275 Franklin Street Site with the highest concentration (2,200 mg/kg) in the 8- to 10-foot interval in boring MW-6 during the April 2008 sampling event.
- Concentrations of VOCs, pesticides, and PCBs in subsurface soil were below Part 375 RRSCOs on the 432 Pearl Street Site.
- Concentrations of lead and mercury were detected slightly above their respective RRSCOs at one sample location on the 432 Pearl Street Site.
- PAHs, including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)pyrene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected in subsurface soil above RRSCOs at one or two samples locations on the 432 Pearl Street Site.
- Soil samples collected by the NYSDEC and analyzed for VOCs during their 2009 Off-Site Investigation (Ref. 12) did not contain VOCs above Part 375 Unrestricted SCOs (USCOs).

1.3.2 Groundwater

The following summary of groundwater sampling results pertains to pre-IRM data collected during the historic investigations (2004), initial RI (2006-2007), Supplemental RI (2008), and NYSDEC off-site groundwater investigations (2009; Ref. 12). Tables 2a and 2b summarize the groundwater analytical results from these on-site investigations. Post-IRM groundwater monitoring results are discussed in Section 1.4.2.

- Total inorganic compound (arsenic, chromium, copper, iron, lead, manganese, and/or sodium) concentrations exceeded Class GA GWQSs/GVs at sample

locations PZ-5, PZ-6, MW-1, and/or MW-2. These compounds either slightly exceeded their respective GWQS/GV and/or are naturally occurring minerals.

- PAHs were detected only in MW-2 (and/or its blind duplicate) at estimated concentrations that exceeded their respective Class GA GWQSs/GVs.
- cVOCs are the primary COC in shallow groundwater with PCE and/or its chemical breakdown products, TCE and cis-1,2-DCE, detected above GWQS/GV on both BCP Sites and off-site.
- The highest cVOCs concentrations were generally observed in the shallow groundwater in the area of the former drycleaner on 275 Franklin Street Site and immediately downgradient on the 267 Franklin Street parcel on the 432 Pearl Street Site.
- Deep groundwater across both BCP Sites contains low (residual) concentrations of cVOCs.

1.3.3 Soil Vapor Intrusion

The following summary of sub-surface soil vapor sampling results pertains to the pre-IRM data collected during the historical investigations (2004), initial RI (2006-2007), and NYSDEC investigation (2009; Ref. 12). Table 3 summarizes the soil vapor results from the 2006 on-site investigations.

- Soil vapor concentrations at the 432 Pearl Street Site ranged from non-detect to 140 ug/m^3 (PCE). Soil vapor results from the 275 Franklin Street Site reported PCE (14,000 ug/m^3), TCE (70 ug/m^3), and 1,1,1-trichloroethane (71 ug/m^3) concentrations among other constituents.
- Soil vapor samples collected from the 267 Franklin Street apartment building (part of the 432 Pearl Street Site) by NYSDEC exceeded NYSDOH air matrix criteria, indicating the need for on-site sub-slab soil vapor mitigation to minimize current exposure.
- Soil vapor samples collected from 265 Franklin Street (off-site) did not exceed the NYSDOH air matrix criteria.

1.3.4 Underground Storage Tanks

There were no underground storage tanks (USTs) associated with these BCP Sites indicated in historical records or found during any Site investigations.

1.4 Summary of Remedial Actions

On July 1, 2008, the NYSDEC approved the Interim Remedial Measures (IRM) Work Plan (Ref. 13) prepared by Benchmark to identify the scope of the planned remedial measures for the 275 Franklin Street Site and the means by which they will be completed. Remedial measures were implemented from summer 2008 through fall 2009. The NYSDEC Division of Environmental Remediation monitored the remedial actions to verify the work was performed in accordance with the BCA, the approved IRM Work Plan, and DER-10 (Ref. 14).

In April 2010, BDC submitted a RI/AA/IRM Report (Ref. 2) to NYSDEC that summarized the RI, supplemental remedial activities, and the IRM completed in 2008-2009. NYSDEC provided a comment letter to that report in February 2011 that, amongst other items, required additional groundwater remedial measures beyond the proposed in-situ HRC injections in the vicinity of MW-5 "source area" on the 275 Franklin Street Site in order to mitigate off-site migration of cVOCs.

In September 2011 after consulting with NYSDEC, BDC submitted an Additional IRM Work Plan (Ref. 15) to NYSDEC expanding the proposed IRM to include both the 275 Franklin Street BCP Site and the 267 Franklin Street parcel of the 432 Pearl Street Site. The Additional IRM Work Plan specifically proposed, in addition to the HRC injection at the source area, injection of zero valent iron (ZVI) and nutrients to enhance the in-situ source area biological treatment, as well as in-situ ZVI groundwater treatment at the downgradient property boundary to mitigate off-site cVOC plume migration. The objective of the additional IRM was clearly defined to be a comprehensive and final groundwater remedy for both BCP Sites.

In a letter dated March 29, 2012, NYSDEC approved implementation of the Additional IRM Work Plan but required further assessment of deep groundwater on-site. After consultation with NYSDEC and with the clear intent to achieve consensus with the NYSDEC regarding the final groundwater remedy prior to implementing additional IRMs, BDC installed an additional deep groundwater well (MW-7) on the 267 Franklin Street parcel of the 432 Pearl Street Site in May 2012 and completed a round of comprehensive groundwater sampling, which included certain off-site wells as requested by NYSDEC.

In August 2012, NYSDEC provided a letter that again affirmed approval of the Additional IRM, but requested the scope of work be further expanded to include additional

injection points, which BDC agreed to. NYSDEC further stated in the letter "at this time, NYSDEC does not concur with your conclusion presented in your 8/21/2012 transmittal email stating that deep groundwater impacts are minimal and that the deep groundwater zone does not require any additional remediation measures other than those currently proposed in the additional IRM and RI/AA/IRM Report dated April 2010. This deep groundwater quality data confirms onsite deep groundwater contamination from chlorinated VOCs and that the chlorinated VOC contamination from the site is migrating offsite."

In October 2012, BDC and Benchmark met with NYSDEC to discuss significant differences in professional opinions over deep groundwater quality. BDC indicated that their intention was for the additional IRMs to serve as the final remedy (along with engineering and institutional controls) and subsequently submitted a revised Additional IRM Work in November 2012. The Department provided a response letter dated November 27, 2012 that indicated the IRM may proceed but did not provide assurance that the IRM could serve as the final remedy. Consequently, BDC notified NYSDEC of their intent to update and re-submit the April 2010 RI/AA/IRM Report to include the additional investigation work subsequently completed by BDC and recommend a final remedy.

The Revised RI/AA/IRM Report was submitted in January 2013. Following review of the report, NYSDEC provided additional comments in July 2013 and prepared draft Proposed Decision Documents for each BCP Site. The final RI/AA/IRM Report was submitted to NYSDEC in July 2013 and approved September 30, 2013.

The following is a summary of the Remedial Actions performed at the BCP Sites:

1. Maintenance of the existing cover system to allow for continued commercial use of the Site.
2. Installation and start-up of an active sub-slab depressurization (ASD) system in December 2008. Post-ASD system activation air sampling events were performed in February and September 2009, and were summarized in the *Immediate Investigation Work Assignment Summary Report, 275 Franklin Street Site, Buffalo, NY* (Ref. 12) prepared by Malcolm Pirnie, Inc. in December 2009. Mitigation Tech installed the system under contract to Malcolm Pirnie, Inc. for the NYSDEC.
3. Installation and operation of a soil vapor extraction (SVE) system from December 2008 through September 2009.
4. Injection of hydrogen release compound (HRC) for in-situ enhanced bioremediation of cVOCs in shallow and intermediate depth Site groundwater in August 2008.

5. Injection of a solution into Site groundwater in April 2014 to enhance both abiotic and biological reductive processes. Figure 5 illustrates the injection point locations.
6. Injection of a chemical oxidant into Site groundwater and saturated "smear zone" interval in March and April 2016 to destroy organic contaminants. Figure 6 shows the injection point locations.
7. Excavation of source area soil/fill in December 2016 with application of a chemical oxidant to excavation bottom to address residual impact prior to backfilling. Figure 7 shows the lateral extent of excavated source area soil/fill.
8. Execution and recording of an Environmental Easement to restrict groundwater and land use and prevent future exposure to any contamination remaining at the Site.
9. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Remedial activities were completed at the Site from April 2014 to December 2016.

1.4.1 Site-Related Treatment Systems

1.4.1.1 Sub-Slab Depressurization System

The NYSDEC installed an active sub-slab depressurization system (ASD) system within the 267 Franklin Street apartment building (on the 432 Pearl Street Site) prior to BDC's ownership of that parcel. Installation of the system is detailed in the Immediate Investigation Work Assignment Summary Report, 275 Franklin Street Site, Buffalo, NY prepared by Malcolm Pirnie, Inc. in December 2009 for the NYSDEC (Ref. 3). Two separate ASD systems (one on the south side and one on the north side) were designed and installed by Mitigation Tech under contract to Malcolm Pirnie, Inc. (see Figure 8). The system began operation in December 2008 and has operated continuously since that time:

Each system is made up of a network of 3-inch and 4-inch diameter PVC piping that provides multiple suction points below the concrete basement floor. The systems provide continuous vacuum in the sub-slab through operation of in-line fans mounted at the end of the system above the roofline. System 1 has five suction points and one RadonAway GP-501 series centrifugal in-line fan. System 2 has three suction points and two RadonAway GP-501

series centrifugal in-line fans. U-tube manometers for each system are installed on vertical risers to provide evidence and measurement of system vacuum.

Pre-ASD system installation air sampling events were performed in May and October 2008 by Malcolm Pirnie, Inc. Post-ASD system activation air sampling events were performed in February and September 2009 by Malcolm Pirnie, Inc. Subsequent to installation of the ASD system, measured concentrations of TCE and PCE were significantly reduced. Where detected in the September 2009 indoor air samples, TCE and PCE are at concentrations well below the recommended DOH action levels.

1.4.2 Remaining Contamination

1.4.2.1 Soil/Fill and Soil Vapor

Following excavation of source area soil/fill in December 2016, the contamination remaining at the BCP Sites includes low concentrations of certain constituents in soil/fill. Tables 1a and 1b summarize historical soil/fill concentrations remaining above USCOs, and Table 4 summarizes post-excavation locations above USCOs. The Excavation Work Plan (Appendix B) will be followed during future excavations at the BCP Sites to minimize exposure to potential remaining contamination. Figure 9 illustrates the sample locations with concentrations above NYSDEC Part 375 USCOs.

1.4.2.2 Soil Vapor

Post-SVE soil samples collected in September 2009 in the vicinity of wells MW-4 and MW-6 at two sampling depths revealed all VOC concentrations below Part 375 USCOs (see Table 5). Therefore, operation of the SVE system as an IRM conducted on the 275 Franklin Street Site has removed all known "source area" contamination in the unsaturated soil/fill.

The ASD system within the apartment building minimizes any potential exposure to residual contaminants in soil vapor and is protective of human health and the environment.

1.4.2.3 Groundwater

Constituents of concern (PCE and its breakdown products) for these BCP Sites remain in Site groundwater; however, the recent groundwater sampling events in January and April 2017 show a downward trend at the majority of on-site monitoring locations. Figures 10-13 present the isoconcentration maps for total cVOCs, PCE, TCE, and cis-1,2-DCE present on-site during the April 2017 sampling event. Further reductions in VOC

concentrations are anticipated over time and will be verified with the long-term groundwater monitoring in accordance with this SMP. In addition, the permeable reactive barrier wall along the property boundary will continue to serve as an off-site contaminant migration control.

As summarized on Table 6, the two post-excavation sampling events in January and April 2017 indicate a significant drop in PCE concentrations within the former source area well MW-5R and decreasing trends in the concentrations of PCE and breakdown products in other on-site piezometers.

2.0 ENGINEERING & INSTITUTIONAL CONTROL PLAN

2.1 Introduction

2.1.1 General

Since remaining contaminated soil/fill and groundwater exist beneath the Sites, Engineering and Institutional Controls (EC/ICs) are required to protect human health and the environment. This EC/IC Plan describes the procedures for the implementation and management of all EC/ICs at the Site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

The EC/IC Plan provides:

- A description of all EC/ICs on the Sites.
- The basic implementation and intended role of each EC/IC.
- A description of the key components of the ICs set forth in the Environmental Easement.
- A description of the features to be evaluated during each required inspection and periodic review.
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Sites.
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

2.2 Engineering Controls

2.2.1 Engineering Control Systems

2.2.1.1 Site Cover

A cover system for the BCP Sites is required to allow for continued restricted-residential or commercial use. Exposure to possible remaining contamination in soil/fill at

the Sites is prevented by the existing cover system that consists of the apartment building foundation, asphalt parking lots, and concrete sidewalks. Figure 14 shows the type and location of the existing cover system materials. The Excavation Work Plan (see Appendix B) outlines the procedures required to be implemented in the event the cover system is breached, penetrated, or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Monitoring Plan included in Section 4 of this SMP.

2.2.1.2 Sub-Slab Depressurization System

The NYSDEC installed an active sub-slab depressurization system (ASD) system within the 267 Franklin Street apartment building (on the 432 Pearl Street Site) prior to BDC's ownership of that parcel. Installation of the system is detailed in the Immediate Investigation Work Assignment Summary Report, 275 Franklin Street Site, Buffalo, NY prepared by Malcolm Pirnie, Inc. in December 2009 for the NYSDEC (Ref. 3). Two separate ASD systems (one on the south side and one on the north side) were designed and installed by Mitigation Tech under contract to Malcolm Pirnie, Inc. (see Figure 8). The system began operation in December 2008 and has operated continuously since that time.

Each system is made up of a network of 3-inch and 4-inch diameter PVC piping that provides multiple suction points below the concrete basement floor. The systems provide continuous vacuum in the sub-slab through operation of in-line fans mounted at the end of the system above the roofline. System 1 has five suction points and System 2 has three suction points. Manometers for each system are installed on vertical risers to provide evidence and measurement of system vacuum.

Pre-ASD system installation air sampling events were performed in May and October 2008. Post-ASD system activation air sampling events were performed in February and September 2009. Subsequent to installation of the ASD system, measured concentrations of TCE and PCE were significantly reduced. Where detected in the September 2009 indoor air samples, TCE and PCE are at concentrations well below the recommended DOH action levels.

Procedures for operating and maintaining the ASD system are documented in the Operation and Maintenance Plan (Section 4 of this SMP). Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan

also addresses severe condition inspections in the event that a severe condition affects controls at the Site.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives (RAOs) identified by the Decision Document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Site Cover System

The site cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

2.2.2.1 Sub-Slab Depressurization System

The ASD system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the ASD system is no longer required, a proposal to discontinue the ASD system will be submitted by the property owner to the NYSDEC and NYSDOH.

2.2.2.2 Post-Treatment/Monitored Natural Attenuation

Groundwater monitoring activities to assess the in-situ ground treatment and long-term natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC or do not trend downward in a satisfactory manner, additional source removal, treatment, and/or control measures will be evaluated and implemented as necessary.

2.3 Institutional Controls

A series of Institutional Controls is required by the Decision Documents to: (1) implement, maintain, and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination;

and; (3) limit the use and development of the Site to restricted-residential or commercial uses only. Adherence to these Institutional Controls on the BCP Sites is required by the Environmental Easements and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easements and this SMP by the Grantor and the Grantor's successors and assigns.
- All Engineering Controls must be operated and maintained as specified in this SMP.
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Groundwater, soil vapor, and other environmental or public health monitoring must be performed as defined in this SMP.
- Data and information pertinent to site management of the Controlled Property must be reported at the frequency and in a manner defined in this SMP.

Institutional Controls identified in the Environmental Easements may not be discontinued without an amendment to or extinguishment of the Environmental Easements.

The BCP Sites have a series of Institutional Controls in the form of Site restrictions. Adherence to these Institutional Controls is required by the Environmental Easements. Site restrictions that apply to the Controlled Property are:

- The property may only be used for restricted-residential or commercial use provided that the long-term EC/ICs included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted and residential use without additional remediation and amendment of the Environmental Easements, as approved by the NYSDEC.
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP.
- The use of the groundwater underlying the property as a source of potable or process water is prohibited without necessary water quality treatment, as determined by the NYSDOH or County DOH, rendering it safe for intended use.
- The potential for vapor intrusion must be evaluated for any new buildings developed on the property, and any potential impacts that are identified must be monitored or mitigated.
- Vegetable gardens and farming on the BCP Sites are prohibited.

- The Site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow, and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The Site has been remediated for restricted-residential use. Any future intrusive work that will penetrate the existing cover system, including modifications or repairs, and encounter or disturb the possible remaining contamination will be performed in compliance with the Excavation Work Plan (EWP) that is attached as Appendix B to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the Sites. A sample HASP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations is included as Appendix C. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP, and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (see Section 5).

The Site owner and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The Site owner will ensure that Site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any additional enclosed structures located over areas that possibly contain remaining contamination and the potential for soil vapor intrusion (SVI) has been identified, an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York." Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (not validated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. SVI sampling results, evaluations, and follow-up actions will also be summarized in the next PRR.

2.4 Inspections and Notifications

2.4.1 Inspections

Inspections of all remedial components installed at the Sites will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the PRR. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed.
- If these controls continue to be protective of human health and the environment.
- Compliance with requirements of this SMP and the Environmental Easements.

- Achievement of remedial performance criteria.
- Sampling and analysis of appropriate media during monitoring events.
- If Site records are complete and up to date.
- Changes, or needed changes, to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The PRR requirements are outlined in Section 5 of this Plan.

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within five days of the event to verify the effectiveness of the EC/ICs implemented at the Sites by a Qualified Environmental Professional (QEP) as defined in NYSDEC DER-10.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in Site use that are required under the terms of the Brownfield Cleanup Agreement, 6NYCRR Part 375, and/or Environmental Conservation Law.
- 15-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Notice within 48-hours of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the Site, including a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Sites or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the BCA, and all approved work plans and reports, including this SMP
- Within 15 days after the transfer of all or part of the Sites, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions. This Contingency Plan describes potential emergencies that may occur on the Sites; procedures for responding to those emergencies; roles and responsibilities during emergency response; and training all workers must receive in order to follow emergency procedures. This Contingency Plan also describes the provisions this Site has made to coordinate its emergency response planning with other contractors on-site and with off-site emergency response organizations.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to Mr. Michael A. Lesakowski. These emergency contact lists must be maintained in an easily accessible location at the Site.

Table 7: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility mark out)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 8: Other Contact Numbers

Michael A. Lesakowski Qualified Environmental Professional	Work: (716) 856-0599 Mobile: (716) 818-3954
Richard L. Dubisz Site Safety and Health Officer (SSHO)	Work: (716) 856-0599 Mobile: (716) 998-4334
To Be Determined Alternate SSHO	Work: (716) 856-0599 Mobile: To Be Determined

* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

Site Location: 275 Franklin Street and 432 Pearl Street Sites
Buffalo, New York 14202

Nearest Hospital Name: Buffalo General Hospital

Hospital Location: 100 High Street, Buffalo, New York 14203

Hospital Telephone: (716) 859-5600

Directions to the Hospital (see Figure 15):

1. Leave Site going north on Franklin Street
2. Turn right onto Wadsworth Street
3. Turn left onto Main Street
4. Turn right onto High Street and continue to 100 High Street on the left

Total Distance: 0.96 miles

Total Estimated Time: 4 minutes

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 7). The list will also be posted prominently at the Site and made readily available to all personnel at all times.

This section of the Response Procedures is dedicated to describing the necessary procedures related to spills or releases of known or suspected petroleum and/or hazardous substances on the Site. The spill response procedures include the following elements:

- Initial notification and evaluation
- Spill response
- Post-spill evaluation

2.5.3.1 Initial Spill Notification and Evaluation

Any worker who discovers a hazardous substance or oil/petroleum spill will immediately notify the Project Manager and SSHO. Workers will, to the best of his/her ability, report the material involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, if any, and any associated injuries.

Following initial report of a spill, the Project Manager will make an evaluation as to whether the release exceeds RQ levels. If an RQ level is exceeded, the Project Manager will notify the Site owner who will in turn notify NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies are to be contacted regarding the release, and will follow-up with written reports as required by the applicable regulations.

2.5.3.2 Spill Response

For all spill situations, the following general response guidelines will apply:

- Only those personnel involved in overseeing or performing containment operations will be allowed within the spill area. If necessary, the area will be roped, ribboned, or otherwise blocked off to prevent unauthorized access.
- Appropriate personal protective equipment (PPE), as specified by the SSHO, will be donned before entering the spill area.
- Ignition points will be extinguished/removed if fire or explosion hazards exist.
- Surrounding reactive materials will be removed.
- Drains or drainage in the spill area will be blocked to prevent inflow of spilled materials or applied materials.

For minor spills, a Spill Control and Containment Kit will be maintained on-site. The kit will consist of, at a minimum, a 50 lb. bag of "speedy dry" granular absorbent material, absorbent pads, shovels, empty 5-gallon pails, and an empty open-top 55-gallon drum. Spilled materials will be absorbed, and shoveled into a 55-gallon drum for proper disposal

(USEPA approval will be secured for on-site treatment of the impacted soils/absorbent materials, if applicable). Impacted soils will be hand-excavated to the point that no visible signs of contamination remains, and will be drummed with the absorbent.

In the event of a major release or a release that threatens surface water, a spill response contractor will be called to the Site. The response contractor may use heavy equipment (e.g., excavator, backhoe, etc.) to berm the soils surrounding the spill site or create diversion trenching to mitigate overland migration or release to navigable waters. Where feasible, pumps will be used to transfer free liquid to storage containers. Spill control/cleanup contractors in the Western NY area that may be contacted for assistance (in order of preference) include:

- The Environmental Service Group, Inc. (NY): (716) 695-6720
- Op-Tech: (716) 525-1962
- Environmental Products and Services of Vermont, Inc.: (716) 597-0001 or (800) 577-4557

2.5.3.3 Post-Spill Evaluation

If a reportable quantity of hazardous material or oil/petroleum is spilled as determined by the Project Manager, a written report will be prepared. The report will identify the root cause of the spill, type and amount of material released, date/time of release, response actions, agencies notified and/or involved in cleanup, and procedures to be implemented to avoid repeat incidents. In addition, all re-useable spill cleanup and containment materials will be decontaminated, and spill kit supplies/disposable items will be replenished.

2.5.3.4 Evacuation Plans

In the event that an area must be evacuated due to an emergency, such as a chemical spill or a fire, Site workers and employees shall exit upwind, if possible. An emergency signal by portable air horn, siren, or whistle consisting of a continuous blast will be used to indicate an emergency requiring Site evacuation. It shall be the responsibility of the SSHO and/or the subcontractor's Health and Safety officer to review evacuation routes and procedures as necessary and to inform all Site workers and employees of any changes.

3.0 SITE MONITORING PLAN

3.1 Introduction

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, the soil cover system, and all affected Site media identified below. Monitoring of other Engineering Controls is described in Chapter 4, Operation, Monitoring, and Maintenance (OM&M) Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, soil vapor);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil;
- Assessing achievement of the remedial performance criteria;
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Semi-annual monitoring of the performance of the remedy and overall reduction in groundwater contamination on-site and off-site will be conducted for the first two years followed by two years of annual monitoring. The frequency thereafter will be determined by NYSDEC. Monitoring of the ASD system will be conducted monthly. Trends in contaminant levels in air and groundwater in the affected areas will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in Table 9 and outlined in detail in Sections 3.2 and 3.3 below.

Table 9: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Groundwater	Semi-annual for 2 years	Groundwater	TCL VOCs, field parameters, elevations
	Annual for 2 years		
ASD System	Monthly	System vacuum	Visual observation of system gauges
Cover System	Annual	Asphalt	Visual observation of cover system integrity

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 Site Cover System Monitoring

Annual visual inspection and maintenance (e.g., repairing cracks/potholes, sealing of asphalt) of the cover system will be required to assure cover integrity and prevent exposure to underlying soil/fill.

3.3 Media Monitoring Program

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy. The network of monitoring wells has been installed to monitor both upgradient and downgradient groundwater conditions at the Site.

Table 6 summarizes the historic and current injection groundwater quality conditions. Appendix D includes the monitoring well construction logs. Figures 10 through 13 present

the isoconcentration maps for total cVOCs, PCE, TCE, and cis-1,2-DCE using the April 2017 groundwater data.

Post-remedial groundwater and performance monitoring will consist of collecting groundwater samples using low-flow sampling procedures per Benchmark's Field Operating Procedure (FOP) contained in Appendix E. Table 10 presents the groundwater monitoring program. Table 11 summarizes the monitoring well and piezometer construction details. Tables 12 and 12A provide groundwater elevation data between October 2008 and April 2017.

After four years of monitoring, a request to the NYSDEC may be made to reduce or eliminate the monitoring requirement if groundwater concentrations fall to within approximately one order of magnitude of the Class GA groundwater quality standards and guidance values (GWQS/GV) per NYSDEC Technical Operations and Guidance Series (TOGS) 1.1.1, and the data do not indicate an increasing trend in contaminant concentration. Otherwise, when Site contaminant concentrations fall below GWQS, groundwater monitoring will be discontinued with the approval of NYSDEC.

If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC or do not trend downward in a satisfactory manner, additional source removal, treatment, and/or control measures will be evaluated and implemented as necessary.

The SMP will be modified to reflect changes in sampling plans approved by NYSDEC. Deliverables for the groundwater monitoring program are specified below.

3.3.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater sampling log presented in Appendix F. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Each groundwater sample will be collected via standard low-flow purge and sample methods and analyzed in the field for water quality parameters (i.e., pH, conductivity, temperature, turbidity, and dissolved oxygen) and in the laboratory for Target Compound List (TCL) VOCs via USEPA Method 8260B. Laboratory samples will be transported under chain-of-custody command to an Environmental Laboratory Approval Program (ELAP)-certified laboratory. The laboratory data package will be a Category A deliverable; however,

the NYSDEC may request, at any time, to upgrade the deliverables to Category B. Benchmark's FOP entitled "Low-Flow Groundwater Purging and Sampling Procedures," is provided in Appendix E. In the event well conditions do not allow for low-flow sampling (e.g., due to poor/slow well recovery), Benchmark will implement bailer purge and sample procedures in accordance with the FOP entitled "Groundwater Purging Procedures Prior to Sample Collection." Regardless of purge procedure, Benchmark's FOP entitled "Groundwater Sample Collection Procedures" will also be followed.

3.3.1.2 Monitoring Well Repairs, Replacement & Decommissioning

If biofouling or silt accumulation occurs, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable. Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3.2 ASD System Monitoring

The Site Owner will perform ASD system monitoring. The ASD system consists of two subsystems: "System 1" includes 5 suction points, two fans (stacked), and one u-tube manometer to measure system vacuum; and "System 2" includes 3 suction points, one fan, and one u-tube manometer to measure system vacuum. A representative of the Site Owner will record the vacuum (in H_2O) at each extraction point on a monthly basis using the form in Appendix G to confirm that adequate depressurization is occurring. Table 9 presents the ASD system monitoring program. Figure 8 provides a layout of the system depicting the piping, fan locations, and extraction and testing points. Appendix H includes ASD system installation information.

3.4 Site-Wide Inspection

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, an inspection form will be completed for each BCP Site (see Appendix I). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General Site conditions at the time of the inspection;
- The Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that Site records are up to date.

3.5 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) included as Appendix J. Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
    - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
    - Sample holding times will be in accordance with the method requirements.
    - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:

  - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
  - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures.
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks.
- QA Performance and System Audits.
- Preventative Maintenance Procedures and Schedules.
- Corrective Action Measures.

3.6 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections will be kept on file by the Site Owner or its designated representative. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the PRR, as specified in Section 5 of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the PRR. A letter report will also be prepared [if required by NYSDEC], subsequent to each sampling event. These reports will include, at a minimum:

- Date of event
- Personnel conducting sampling
- Description of the activities performed
- Type of samples collected (e.g., groundwater, vacuum, etc.)
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.)
- Sampling results in comparison to appropriate standards/criteria

- A figure illustrating sample type and sampling locations
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format)
- Any observations, conclusions, or recommendations
- A determination as to whether groundwater conditions have changed since the last reporting event

All data generated will be submitted in an electronic data deliverable (EDD) that complies with the NYSDEC's Electronic Data Warehouse Standards (EDWS) or as otherwise directed by DER. A summary of the monitoring program deliverables are summarized in Table 13 below.

Table 13: Schedule of Monitoring/Inspection Reports

Task	Monitoring Frequency*	Reporting Frequency*
Site Inspection (PRR)	Annual	Annual
Groundwater Monitoring	Semi-Annual (2 years) Annual (2 years)	Semi-Annual (Data Only) Annual Groundwater Monitoring Report with PRR
ASD System	Monthly	Annual ASD Monitoring Report with PRR
Cover System	Annual	Annual

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC

4.0 OPERATION & MAINTENANCE PLAN

4.1 Introduction

This Operation and Maintenance (O&M) Plan describes the measures necessary to operate, monitor, and maintain the mechanical components of the remedy selected for the Site. This O&M Plan:

- Includes the steps necessary to allow individuals unfamiliar with the Site to operate and maintain the remedial systems.
- Includes an operation and maintenance contingency plan.
- Will be updated periodically to reflect changes in Site conditions or the manner in which the remedial systems are operated and maintained.

Information on non-mechanical Engineering Controls (i.e., cover system) is provided in Section 3 – EC/IC Plan. A copy of this O&M Plan, along with the complete SMP, will be kept at the Site. This O&M Plan is not to be used as a stand-alone document, but as a component document of the SMP.

4.2 Engineering Control System Operation & Maintenance

4.2.1 Sub-Slab Depressurization System

An ASD system was installed in the 267 Franklin Street apartment building on the 432 Pearl Street Site by the NYSDEC prior to BDC's ownership of that parcel. Two separate ASD systems (one on the south side and one on the north side) were designed and installed by Mitigation Tech under contract to Malcolm Pirnie, Inc. Mitigation Tech is a Rochester, New York based vapor control (and radon) experienced contractor. The system began operation in December 2008 and has operated continuously since that time. Appendix H includes as-built drawings for the ASD system.

Each system is made up of a network of 3-inch and 4-inch diameter PVC piping that provides multiple suction points below the concrete basement floor. The systems provide continuous vacuum in the sub-slab through operation of in-line fans mounted at the end of the system above the roofline. System 1 has five suction points and one RadonAway GP-501 series centrifugal in-line fan. System 2 has three suction points and two RadonAway GP-501

series centrifugal in-line fans. U-tube monometers for each system are installed on vertical risers to provide evidence and measurement of system vacuum.

4.2.1.1 Scope

The ASD System operates automatically and continuously. The U-tube manometers indicate that the system is operational. In the event that one of the fans requires maintenance, RadonAway will be contacted for instruction.

4.2.1.2 System Start-Up and Testing

Initial communication testing of the sub-slab was performed to evaluate the number of extraction points and type of exhaust fans required to optimize the systems performance under the specific Site conditions. Testing was performed by Malcolm Pirnie as described in the December 2009 Immediate Investigation Work Assignment Summary Report, 275 Franklin Street Site, Buffalo, NY (Ref. 3). Pre-ASD system installation air sampling events were performed in May and October 2008 by Malcolm Pirnie. Post-ASD system activation air sampling events were performed in February and September 2009 by Malcolm Pirnie.

The system testing described above will be conducted if, in the course of the ASD system lifetime, significant changes are made to the system, and the system must be restarted.

4.2.1.3 System Operation: Routine Operation Procedures

Appendix H includes the manufacturer's recommendations for routine operation of system components.

4.2.1.4 System Operation: Routine Equipment Maintenance

Appendix H includes the manufacturer's recommended routine equipment maintenance of system components as well as forms to record the results of monthly and annual inspections.

4.2.1.5 System Operation: Non-Routine Equipment Maintenance

Appendix H describes non-routine equipment maintenance that may be required. System or component replacement due to damage or reduced effectiveness will be discovered during routine inspections.

4.3 Engineering Control System Performance Monitoring

4.3.1 Sub-Slab Depressurization System

ASD systems have been installed to mitigate possible soil vapor intrusion into the 267 Franklin Street apartment building on the 432 Pearl Street Site. A representative of the Site Owner will perform all operation, maintenance, monitoring, and reporting for the ASD system.

4.3.1.1 Monitoring Schedule

A representative of the Site Owner will visually inspect the manometers on a monthly basis and the vacuum reading is recorded on a log to verify that system vacuum pressure is less than the maximum recommended operating pressure. The monthly inspection will also include a checklist to verify equipment operation and malfunctions. Benchmark or the Site Owner will conduct an annual inspection of the entire ASD system. Appendix G includes the monthly log and annual inspection forms.

4.3.1.2 General Equipment Monitoring

Benchmark or the Site Owner will periodically perform a visual inspection of the complete system. ASD system components monitored include, but are not limited to, the following:

- Vacuum indicators (manometers)
- General system piping

Appendix G includes a complete list of components to be inspected. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair as per the Operation and Maintenance Plan are required immediately.

4.3.1.3 System Monitoring Devices and Alarms

The ASD system does not have a warning device to indicate that the system is not operating properly; however, monthly vacuum readings via the manometers would provide an indication of fan failure. In the event that the system is not operating properly, applicable maintenance and repairs will be conducted and the ASD system restarted. Operational problems will be noted in the subsequent PRR.

4.3.1.4 Sampling Event Protocol

No samples from the ASD system will be collected for analytical testing.

4.4 Maintenance & Performance Monitoring Reporting Requirements

Maintenance reports and any other information generated during regular operations at the Site will be kept on-file in BDC's head office and on-site if BDC constructs an office building during redevelopment. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the PRR, as specified in the Section 5 of this SMP.

4.4.1 Routine Maintenance Reports

Checklists or forms (see Appendices G and J) will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date
- Name, company, and position of person(s) conducting maintenance activities
- Maintenance activities conducted
- Any modifications to the ASD or cover systems
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet)
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form)

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form containing the following minimum information will be completed:

- Date
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities
- Type of required maintenance and date of discovery
- Description of repairs or adjustments made to the ASD or cover systems

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet)
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form)

5.0 INSPECTIONS, REPORTING & CERTIFICATIONS

5.1 Site Inspections

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 – Monitoring Plan and Section 4 – O&M Plan developed in accordance with this SMP. At a minimum, a Site-wide inspection will be conducted annually. Inspections of remedial components will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, & Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms (see Appendix G). Additionally, a general site-wide inspection form will be completed during the site-wide inspection (see Appendix I). These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format in the PRR.

5.1.3 Evaluation of Records & Reporting

The results of the inspection and Site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective
- The Monitoring Plan is being implemented
- Operation and maintenance activities are being conducted properly; and, based on the above items
- The Site remedy continues to be protective of public health and the environment and is performing as designed in the Work Plans and FER

5.2 Certification of Engineering and Institutional Controls

After the last inspection of the reporting period, a Professional Engineer (P.E.) licensed to practice in New York State or a QEP[1] will complete an EC/IC certification form for each BCP Site. The EC/IC certification forms, which will be signed by the P.E. and Site Owner or its representative, will include the following certification:

For each EC/IC identified for the Site, I certify that all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional control and/or engineering control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any Site Management Plan for this control;
- Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the Site is compliant with the Environmental Easement;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A"

[1] A Qualified Environmental Professional other than a licensed Professional Engineer (P.E.) may complete the certification if the engineering controls are limited to non-mechanical systems. Active groundwater remediation systems, soil vapor extraction systems, etc. require P.E. certification.

misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] (and if the site consists of multiple properties): [and I have been authorized and designated by all site owners to sign this certification] for the site.

The signed certifications will be included in the PRR described below.

5.3 Periodic Review Report

A Periodic Review Report (PRR) that includes both BCP Sites will be submitted to the Department every year, beginning eighteen months after the Certificate of Completion is issued. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site described in Appendix A (Metes and Bounds). The PRR will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. The PRR will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site;
- Results of the required annual Site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the Site during the reporting period in electronic format;
- A summary of any monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A Site evaluation, which includes the following:
    - Compliance of the remedy with the requirements of the site-specific Decision Document
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications

  - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan
  - The overall performance and effectiveness of the remedy
- A performance summary for all treatment systems at the Site during the calendar year, including information such as:
  - The number of days the system was run for the reporting period
  - The average, high, and low flows per day
  - The contaminant mass removed
  - A description of breakdowns and/or repairs along with an explanation for any significant downtime
  - A description of the resolution of performance problems
  - A summary of the performance, effluent and/or effectiveness monitoring
  - Comments, conclusions, and recommendations based on data evaluation

The PRR will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the Site is located, and in electronic format to NYSDEC Central Office, Regional Office, and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted to the NYSDEC for approval. The plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

6.0 REFERENCES

1. The Sanborn Library, LLC. Sanborn maps dated 1889, 1899, 1925, 1951, 1981, and 1986.

2. Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC. *Remedial Investigation/Alternatives Analysis/Interim Remedial Measures Report, 275 Franklin Street & 432 Pearl Street Sites, Buffalo, New York, BCP Site Nos. C915208 & C915237*. April 20109. Revised January and July 2013.

3. Nature's Way Environmental Consultants & Contractors, Inc. *Limited Environmental Investigation, 275 Franklin Street, Buffalo, NY*. September 15, 2004.

4. Benchmark Environmental Engineering & Science, PLLC. *Preliminary Site Investigation Letter Report, 275 & 277 Franklin Street and 470 Pearl Street parcels, Buffalo, NY*. March 10, 2006.

5. Benchmark Environmental Engineering & Science, PLLC. *Addendum to March 2006 Preliminary Site Investigation, 432 Pearl Street, Buffalo, NY*. June 26, 2006.

6. United States Department of Agriculture (USDA), Soil Conservation Service. *Soil Survey of Erie County, New York*. 1972.

7. Buehler, E.J., & Tesmer, I.H. *Geology of Erie County, New York: Buffalo Society of Natural Sciences Bulletin v. 21, no. 3*. 1963.

8. Bouwer, H. and R.C. Rice. *A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, Vol. 12, No. 3, pp. 423-428*. 1976.

9. Benchmark Environmental Engineering & Science, PLLC. *Remedial Investigation Work Plan, Buffalo Development Corporation Hotel Site, Buffalo, NY*. July 2006.

10. Benchmark Environmental Engineering & Science/NYSDEC Comment/Response Letter dated October 16, 2006.

11. Benchmark Environmental Engineering & Science, PLLC. *Supplemental Remedial Investigation Work Plan, 275 Franklin Street Site, Buffalo, NY*. March 5, 2008.

12. New York State Department of Environmental Conservation. *Immediate Investigation Work Assignment Summary Report, 275 Franklin Street Site, Buffalo, New York*. December 2009.

13. Benchmark Environmental Engineering & Science, PLLC. *Interim Remedial Measures*

Work Plan, 275 Franklin Street Site, Buffalo, NY. June 2008.

14. New York State Department of Environmental Conservation. *DER-10; Technical Guidance for Site Investigation and Remediation.* May 2010.

15. Benchmark Environmental Engineering & Science, PLLC. *Additional Interim Remedial Measures Work Plan, 275 Franklin Street Site, BCP Site No. C915208, Buffalo, New York.* September 30, 2011.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1a

SUMMARY OF SOIL ANALYTICAL DATA VERSUS USCOs (2004-2006)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	Sample Event																						Unrestricted SCOs [3]
	Historical Data							Brownfield Cleanup Program Remedial Investigation Data															
	275-277 Franklin St. (September 2004)		279 Franklin St. (January 2006)		432 Pearl St. (January & November 2006)			279 Franklin St. (November 2006)			275-277 Franklin St. (November 2006)					432 Pearl St. (November 2006)						267 Franklin St. (November 2006)	
	B-3 (10-12')	B-5 (10-12')	SB-1 (1-4')	SB-2 (1-4')	SB-1 (1-4')	SB-2 (1-4')	SB-3 (1-4')	PZ-1 (1-4')	PZ-2 (6-8')	PZ-3 (2-4')	PZ-4 (6-8')	PZ-5 (8-9')	PZ-6 (6-8')	MW-1 (6-10')	BD[2] (6-10')	PZ-8 (1-4')	PZ-9 (2-4')	PZ-9 (4-8')	PZ-10 (4-8')	SB-4 (4-8')	MW-2 (2-6')	MW-3 (6-8')	
TCL Volatile Organic Compounds (VOCs) - mg/kg [4]																							
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.006 J	ND	0.002 J	0.003 J	ND	ND	NA	ND	ND	ND	ND	**1.1**
Tetrachloroethene	**12.7**	0.671	ND	ND	ND	ND	ND	0.044	0.006 J	0.042	0.018	0.015	0.01	0.13 J	0.54 J	ND	ND	NA	ND	ND	ND	0.078	**1.3**
Total VOCs	*12.70*	*0.67*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.04*	*0.01*	*0.04*	*0.02*	*0.02*	*0.01*	*0.13*	*0.54*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.08*	--
TCL SVOCs - base neutral fraction (mg/kg) [4]																							
Acenaphthene	NA	NA	ND	ND	ND	1.4 J	ND	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	ND	NA	ND	NA	NA	**20**
Acenaphthylene	NA	NA	ND	ND	ND	0.48 J	ND	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	ND	NA	ND	NA	NA	**100 ***
Anthracene	NA	NA	ND	ND	ND	2.7 J	ND	NA	NA	NA	NA	NA	NA	ND	0.009 J	0.024 J	NA	ND	NA	ND	NA	NA	**100 ***
2,4-Dinitrophenol	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	1.4 J	3.7 J	1 J	NA	0.86 J	NA	0.85 J	NA	NA	**--**
Benzo(a)anthracene	NA	NA	ND	0.44 J	**7.2 J**	**7.7 J**	0.8 J	NA	NA	NA	NA	NA	NA	0.013 J	0.041 J	0.14 J	NA	ND	NA	ND	NA	NA	**1**
Benzo(b)fluoranthene	NA	NA	ND	0.57 J	**10 J**	**12**	0.93 J	NA	NA	NA	NA	NA	NA	0.015 J	0.062 J	0.16 J	NA	ND	NA	ND	NA	NA	**1**
Benzo(k)fluoranthene	NA	NA	ND	ND	**4.4 J**	**2.6 J**	0.35 J	NA	NA	NA	NA	NA	NA	0.012 J	0.016 J	0.16 J	NA	ND	NA	ND	NA	NA	**0.8**
Benzo(ghi)perylene	NA	NA	ND	0.47 J	4.7 J	4.2 J	0.38 J	NA	NA	NA	NA	NA	NA	0.014 J	0.035 J	0.05 J	NA	ND	NA	ND	NA	NA	**100**
Benzo(a)pyrene	NA	NA	ND	ND	**7.2 J**	**8.3**	0.74 J	NA	NA	NA	NA	NA	NA	0.009 J	0.044 J	0.14 J	NA	ND	NA	ND	NA	NA	**1**
Bis (2-ethylhexyl) phthalate	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	11	5.9	ND	NA	ND	NA	ND	NA	NA	**--**
Butyl benzyl phthalate	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.75	0.4	ND	NA	ND	NA	ND	NA	NA	**--**
Carbazole	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND	0.039 J	NA	ND	NA	ND	NA	NA	**--**
Chrysene	NA	NA	ND	ND	**7.8 J**	**8.4 J**	0.71 J	NA	NA	NA	NA	NA	NA	0.012 J	0.04 J	0.2 J	NA	ND	NA	ND	NA	NA	**1**
Dibenzo (a,h) anthracene	NA	NA	ND	ND	ND	**1.3 J**	ND	NA	NA	NA	NA	NA	NA	0.014 J	0.011 J	0.017 J	NA	ND	NA	ND	NA	NA	**0.33**
Dibenzofuran	NA	NA	ND	ND	ND	1.1 J	ND	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	ND	NA	ND	NA	NA	**--**
Di-n-butyl phthalate	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.18 J	0.13 J	ND	NA	ND	NA	ND	NA	NA	**--**
Di-n-octyl phthalate	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.52	0.3 J	ND	NA	ND	NA	ND	NA	NA	**--**
Fluoranthene	NA	NA	0.63 J	0.55 J	18 J	20	1.9 J	NA	NA	NA	NA	NA	NA	0.019 J	0.083 J	0.49	NA	ND	NA	ND	NA	NA	**100**
Fluorene	NA	NA	ND	ND	ND	1.3 J	ND	NA	NA	NA	NA	NA	NA	ND	ND	0.011 J	NA	ND	NA	ND	NA	NA	**30**
Indeno (1,2,3-cd) pyrene	NA	NA	ND	ND	**4.3 J**	**3.8 J**	0.36 J	NA	NA	NA	NA	NA	NA	0.016 J	0.038 J	0.065 J	NA	ND	NA	ND	NA	NA	**0.5**
2-Methylnaphthalene	NA	NA	ND	ND	ND	0.66 J	ND	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	ND	NA	ND	NA	NA	**--**
Naphthalene	NA	NA	ND	ND	ND	1.3 J	ND	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	ND	NA	ND	NA	NA	**12**
N-Nitroso-Di-n-propylamine	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND	ND	0.34 J	0.34 J	NA	ND	NA	NA	**--**
Phenanthrene	NA	NA	ND	ND	12 J	17	1.5 J	NA	NA	NA	NA	NA	NA	0.01 J	0.044 J	0.22 J	NA	ND	NA	ND	NA	NA	**100**
Pyrene	NA	NA	0.53 J	0.58 J	17 J	21	1.7 J	NA	NA	NA	NA	NA	NA	0.016 J	0.059 J	0.27 J	NA	ND	NA	ND	NA	NA	**100**
Total SVOCs	--	--	*1.16*	*2.61*	*92.6*	*113*	*9.37*	--	--	--	--	--	--	*14.0*	*10.9*	*2.99*	*0.34*	*1.20*	--	*0.85*	--	NA	--

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	Sample Event																					Unrestricted SCOs [3]
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	275-277 Franklin St. (September 2004)		279 Franklin St. (January 2006)		432 Pearl St. (January & November 2006)			279 Franklin St. (November 2006)			275-277 Franklin St. (November 2006)					432 Pearl St. (November 2006)						267 Franklin St. (November 2006)	
	B-3 (10-12')	B-5 (10-12')	SB-1 (1-4')	SB-2 (1-4')	SB-1 (1-4')	SB-2 (1-4')	SB-3 (1-4')	PZ-1 (1-4')	PZ-2 (6-8')	PZ-3 (2-4')	PZ-4 (6-8')	PZ-5 (8-9')	PZ-6 (6-8')	MW-1 (6-10')	BD[2] (6-10')	PZ-8 (1-4')	PZ-9 (2-4')	PZ-9 (4-8')	PZ-10 (4-8')	SB-4 (4-8')	MW-2 (2-6')	MW-3 (6-8')	
Pesticides/PCBs (mg/kg) [4]																							
Dieldrin	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	**0.0051 J**	0.0038 J	ND	NA	ND	NA	ND	NA	NA	**0.005**
4,4'-DDE	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	**0.0053 J**	**0.0037 J**	ND	NA	ND	NA	ND	NA	NA	**0.0033**
4,4'-DDD	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	**0.0089 J**	**0.0067 J**	ND	NA	ND	NA	ND	NA	NA	**0.0033**
4,4'-DDT	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	**0.044 J**	**0.026 J**	0.0005 J	NA	ND	NA	ND	NA	NA	**0.0033**
Methoxychlor	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	0.0068 NJ	ND	NA	ND	NA	ND	NA	NA	**--**
Endrin	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	**0.015 J**	**0.019 J**	ND	NA	ND	NA	ND	NA	NA	**0.014**
Endrin ketone	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.003 J	ND	ND	NA	0.0007 J	NA	ND	NA	NA	**--**
Endrin aldehyde	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND	1E-03 NJ	NA	ND	NA	ND	NA	NA	**--**
alpha-Chlordane	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.0035 J	ND	ND	NA	ND	NA	ND	NA	NA	**0.094**
gamma-Chlordane	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.0034 J	0.0024 NJ	ND	NA	ND	NA	ND	NA	NA	**--**
Arochlor 1254	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	**0.15 J**	**0.19 J**	ND	NA	ND	NA	ND	NA	NA	**0.1**
TAL Metals (mg/kg)																							
Aluminum	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	2190 J	2770 J	5930 *	NA	2310 *	NA	1500 *	NA	NA	**--**
Antimony	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.92 B	ND	ND	NA	ND	NA	ND	NA	NA	**--**
Arsenic	NA	NA	3.5	5.1	5.3	9	4.3	NA	NA	NA	NA	NA	NA	1.6 J	1.9 J	2.6 J	NA	0.44 J	NA	0.69 J	NA	NA	**13**
Barium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	15.7 B	21.6	111	NA	13.2 B	NA	12.5 B	NA	NA	**350**
Beryllium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.09 B	0.1 B	ND	NA	ND	NA	ND	NA	NA	**7.2**
Cadmium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	0.14 B	0.22 B	0.16 B	NA	ND	NA	0.1 B	NA	NA	**2.5**
Calcium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	41200 J	53300 J	28600 *	NA	59200 *	NA	38300 *	NA	NA	**--**
Chromium	NA	NA	6.3	11.1	6.6	11.4	8.2	NA	NA	NA	NA	NA	NA	3.9	7.1	7.6	NA	3.3	NA	2.5	NA	NA	**30**
Cobalt	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	1.8 B	2.3 B	2.9 B	NA	1.3 B	NA	1.3 B	NA	NA	**--**
Copper	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	5.8	12.4	16.4	NA	4.2	NA	4.8	NA	NA	**50**
Iron	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	6370	8470	8910 *	NA	5680 *	NA	4010 *	NA	NA	**--**
Lead	NA	NA	**87.8**	**358**	**103**	**507**	**78.1**	NA	NA	NA	NA	NA	NA	6.3 J	9.4 J	**72.3 J**	NA	3.8 J	NA	8.3 J	NA	NA	**63**
Magnesium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	18800	24400	6960 *	NA	24300 *	NA	16900 *	NA	NA	**--**
Manganese	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	208 J	266 J	428 J	NA	157 J	NA	137 J	NA	NA	**1600**
Mercury	NA	NA	0.18	**0.33**	0.089	**1.1**	0.11	NA	NA	NA	NA	NA	NA	ND	ND	**0.426**	NA	ND	NA	ND	NA	NA	**0.18**
Nickel	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	3.7 B	4.7	7.0	NA	3.2 B	NA	2.6 B	NA	NA	**30**
Potassium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	547	707	886	NA	615	NA	382 B	NA	NA	**--**
Selenium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND	0.69 B	NA	ND	NA	ND	NA	NA	**3.9**
Silver	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND	0.15 B	NA	ND	NA	ND	NA	NA	**2**
Sodium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	153 B	224 B	1080	NA	124 B	NA	113 B	NA	NA	**--**
Thallium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	ND	NA	ND	NA	NA	**--**
Vanadium	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	9.3	12.2	12.9	NA	8.1	NA	5.4	NA	NA	**--**
Zinc	NA	NA	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	52.3 J	64.9 J	88.8 *	NA	42.9 *	NA	43.6 *	NA	NA	**109**

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

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Buffalo, New York

Parameter [1]	Sample Event																					Unrestricted SCOs [3]
	Historical Data							Brownfield Cleanup Program Remedial Investigation Data														
	275-277 Franklin St. (September 2004)		279 Franklin St. (January 2006)		432 Pearl St. (January & November 2006)			279 Franklin St. (November 2006)			275-277 Franklin St. (November 2006)					432 Pearl St. (November 2006)						267 Franklin St. (November 2006)	
	B-3 (10-12')	B-5 (10-12')	SB-1 (1-4')	SB-2 (1-4')	SB-1 (1-4')	SB-2 (1-4')	SB-3 (1-4')	PZ-1 (1-4')	PZ-2 (6-8')	PZ-3 (2-4')	PZ-4 (6-8')	PZ-5 (8-9')	PZ-6 (6-8')	MW-1 (6-10')	BD[2] (6-10')	PZ-8 (1-4')	PZ-9 (2-4')	PZ-9 (4-8')	PZ-10 (4-8')	SB-4 (4-8')	MW-2 (2-6')	MW-3 (6-8')	
Wet Chemistry Analysis (units as indicated)																							
Leachable pH (S.U.)	NA	NA	NA	NA	NA	NA	NA	7.84	8.1	8.31	8.03	8.06	8.19	8.38	7.85	9.18	9.28	8.12	8.62	8.85	NA	NA	--

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Blind duplicate collected from MW-1.
3. Values per NYSDEC Part 375 Soil Cleanup Objectives (December 2006). "100* " = the SCOs for unrestricted use were capped at a maximum value of 100 ppm.
4. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparison to SCOs.

Definitions:
ND = Parameter not detected above laboratory detection limit.
NA = Sample not analyzed for parameter.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
b = Analyte was detected in the associated blank as well as in the sample. Value is above the action level for consideration as being external contamination.
B = Indicates a value greater than or equal to the instrument detection limit, but less than the quantitation limit.
* = Indicates the spike or duplicate analysis is not within the quality control limits.
D = All compounds were identified in an analyisis at the secondary dilution factor.
N = Indicates spike sample recovery is not within the quality control limits.
E = Indicates value estimated or not reported due to the presence of interferences.
P = Detected concentrations between the two GC columns is greater than 25%; lower value is reported and flagged (for CLP methodology only).
BOLD = Sample Result exceeds unrestricted SCO

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1b

SUMMARY OF SOIL ANALYTICAL DATA VERSUS USCOs (APRIL 2008)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	Sample Locations 275-277 Franklin Street						Restricted Residential SCOs [2]	Unrestricted SCOs [3]	Protection of Groundwater SCOs
	MW -4 (4-6')	MW - 4 (8-10')	MW - 4 (10-12')	MW - 6 (4-6')	MW - 6 (8-10')	MW - 6 (10-12')			
TCL Volatile Organic Compounds (VOCs) - mg/kg [3]									
Acetone	ND	0.006 J	ND	ND	ND	ND	**100**	**0.05**	**0.05**
1,2-Dichlorobenzene	ND	0.006	0.002 J	ND	0.11 J	ND	**100**	**1.1**	**1.1**
1,4-Dichlorobenzene	ND	ND	ND	ND	0.012 J	ND	**13**	**1.8**	**1.8**
cis-1,2-Dichloroethene (cis-1,2-DCE)	0.003 J	0.006	0.022	0.002 J	0.033 J	ND	**100**	**0.25**	**0.25**
Isopropylbenzene	ND	ND	ND	ND	0.008 J	ND	--	--	--
Methylene chloride	0.009	0.012	0.006	0.006	0.006 J	ND	**100**	**0.05**	**0.05**
1,2,4-Trichlorobenzene	ND	ND	ND	ND	0.003 J	ND	--	--	**3.6**
Trichloroethene (TCE)	ND	ND	ND	ND	0.063 J	ND	**21**	**0.47**	**0.47**
Tetrachloroethene (PCE)	**1.6 D**	**20 D**	**4.1 D**	0.87 D	**2,200 DJ**	**350**	**19**	**1.3**	**1.3**
Total VOCs	*1.6*	*20.0*	*4.1*	*0.9*	*2,200*	*350*	--	--	--

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Restricted-Residential Soil Cleanup Objectives (December 2006).
3. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparison to SCOs.

Definitions:
ND = Parameter not detected above laboratory detection limit.
"--" = No SCO available.
D = All compounds were identified in an analyisis at the secondary dilution factor.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.

BOLD	= Sample Result exceeds Unrestricted SCO
BOLD	= Sample Result exceeds Restricted Residential SCO
BOLD	= Sample Result exceeds Protection of Groundwater SCO

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2a

SUMMARY OF GROUNDWATER ANALYTICAL DATA (2004-2007)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	Sample Location and Date																			GWQS/ GV [3]
	Historical Data		Brownfield Cleanup Program Remedial Investigation																	
	BMW-3	BMW-5	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	PZ-8	PZ-9	PZ-10	PZ-11	PZ-12	PZ-13	PZ-14	MW-1	MW-2	Blind Dup [2]	MW-3	
	Sep-04	Sep-04	11/20/06	11/16/06	11/16/06	11/16/06	11/20/06	11/16/06	11/16/06	11/16/06	11/16/06	11/16/06	01/05/07	01/05/07	01/05/07	01/05/07	12/08/06	12/08/06	12/08/06	12/08/06	
TCL Volatile Organic Compounds (VOCs) - ug/L																					
Acetone	ND	ND	1 J	1 J	1 J	2 J	ND	ND	2 J	3 J	2 J	2 J	ND	ND	ND	ND	ND	ND	ND	ND	**50**
Chloroform	ND	ND	ND	ND	ND	ND	3 J	ND	ND	ND	ND	1 J	ND	ND	ND	ND	ND	ND	ND	ND	**7**
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10 J	ND	**--**
Cyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	1 J	1 J	1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	**--**
cis-1,2-Dichloroethene	ND	ND	ND	ND	1 J	ND	**42**	**26**	ND	ND	ND	ND	**94**	ND	1 J	**6 J**	2 J	ND	ND	ND	**5**
Methylcyclohexane	ND	ND	ND	ND	1 J	ND	1 J	1 J	2 J	1 J	2 J	1 J	ND	ND	ND	ND	ND	ND	ND	ND	**--**
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10 J**	ND	ND	ND	**64 DJ**	ND	ND	ND	**5**
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1**
Trichloroethene (TCE)	ND	ND	ND	ND	ND	3 J	**11**	5 J	ND	ND	ND	ND	**17 J**	ND	ND	**17**	**21**	ND	ND	ND	**5**
Tetrachloroethene (PCE)	**137,000**	**70,400**	**14**	**90**	**300**	**530**	**9700**	**1000**	4 J	4 J	**10**	2 J	**18000 J**	**7200 J**	**180 J**	**3200 J**	**4100**	5 J	**180 J**	**6 J**	**5**
Toluene	ND	ND	ND	ND	1 J	1 J	ND	1 J	1 J	1 J	2 J	1 J	ND	ND	ND	ND	ND	ND	ND	ND	**5**
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND	ND	ND	**3**
Total VOCs	*137000*	*70400*	*15*	*91*	*304*	*536*	*9758*	*1033*	*10*	*10*	*17*	*7*	*18121*	*7200*	*181*	*3224*	*4187*	*5*	*190*	*6*	
TCL SVOCs - (ug/L)																					
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	**0.8 J**	NA	**0.002**
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	**0.6 J**	**1 J**	NA	**ND**
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	**2 J**	NA	**0.002**
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	1 J	NA	**--**
Caprolactam	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	1000 J	940 J	NA	**--**
Chrysene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	**1 J**	**2 J**	NA	**0.002**
Di-n-butyl phthalate	NA	NA	NA	NA	NA	NA	10 UJ	0.5 J	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	**50**
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	40 UJ	40 UJ	NA	NA	NA	NA	NA	NA	NA	NA	40 J	40 J	40 J	NA	**10**
Fluoranthene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	2 J	3 J	NA	**50**
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	**0.9 J**	NA	**0.002**
Phenanthrene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	1 J	2 J	NA	**50**
Pyrene	NA	NA	NA	NA	NA	NA	10 UJ	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	2 J	2 J	NA	**50**
Pesticides (ug/L)																					
alpha-BHC	NA	NA	NA	NA	NA	NA	ND	0.05 UJ	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.014 J	0.011 J	NA	**--**
Endosulfan Sulfate	NA	NA	NA	NA	NA	NA	ND	0.1 UJ	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	0.021 J	NA	**--**
4,4'-DDT	NA	NA	NA	NA	NA	NA	ND	0.1 UJ	NA	NA	NA	NA	NA	NA	NA	NA	0.094 J	ND	0.023 J	NA	**0.2**
PCBs (ug/L)																					
Aroclor 1260	NA	NA	NA	NA	NA	NA	ND	1 UJ	NA	NA	NA	NA	NA	NA	NA	NA	0.094 J	0.1 J	ND	NA	**--**
Inorganic Compounds (ug/L)																					
Aluminum	NA	NA	NA	NA	NA	NA	31300	13900	NA	NA	NA	NA	NA	NA	NA	NA	1040	1450	1310	NA	**--**
Arsenic	NA	NA	NA	NA	NA	NA	**42.4**	17.3	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	**25**
Barium	NA	NA	NA	NA	NA	NA	1000	288	NA	NA	NA	NA	NA	NA	NA	NA	80.2 B	80.3 B	78.3 B	NA	**1000**
Beryllium	NA	NA	NA	NA	NA	NA	ND	1.4 B	NA	NA	NA	NA	NA	NA	NA	NA	0.18 B	0.47 B	0.45 B	NA	**--**
Cadmium	NA	NA	NA	NA	NA	NA	4.1 B	1.7 B	NA	NA	NA	NA	NA	NA	NA	NA	1.2 B	ND	1 B	NA	**5**
Calcium	NA	NA	NA	NA	NA	NA	671000 J	366000	NA	NA	NA	NA	NA	NA	NA	NA	140000	132000	132000	NA	**--**
Chromium	NA	NA	NA	NA	NA	NA	**67.4**	28.1	NA	NA	NA	NA	NA	NA	NA	NA	1.6 B	2.1 B	2.3 B	NA	**50**

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TABLE 2a

SUMMARY OF GROUNDWATER ANALYTICAL DATA (2004-2007)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	Sample Location and Date																			GWQS/ GV [3]
	Historical Data		Brownfield Cleanup Program Remedial Investigation																	
	BMW-3	BMW-5	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-6	PZ-7	PZ-8	PZ-9	PZ-10	PZ-11	PZ-12	PZ-13	PZ-14	MW-1	MW-2	Blind Dup [2]	MW-3	
	Sep-04	Sep-04	11/20/06	11/16/06	11/16/06	11/16/06	11/20/06	11/16/06	11/16/06	11/16/06	11/16/06	11/16/06	01/05/07	01/05/07	01/05/07	01/05/07	12/08/06	12/08/06	12/08/06	12/08/06	
Inorganic Compounds (ug/L)																					
Cobalt	NA	NA	NA	NA	NA	NA	70.2	34.7 B	NA	NA	NA	NA	NA	NA	NA	NA	2.2 B	3 B	2.9 B	NA	--
Copper	NA	NA	NA	NA	NA	NA	**225**	75.8	NA	NA	NA	NA	NA	NA	NA	NA	3.6 B	3.3 B	3.9 B	NA	**200**
Iron	NA	NA	NA	NA	NA	NA	**97700**	**33500 J**	NA	NA	NA	NA	NA	NA	NA	NA	**1630 J**	**2900 J**	**2820 J**	NA	**300**
Iron- Soluble	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	130	**541**	ND	NA	**300**
Lead	NA	NA	NA	NA	NA	NA	**156**	**223**	NA	NA	NA	NA	NA	NA	NA	NA	15.3	4 B	4.6 B	NA	**25**
Magnesium	NA	NA	NA	NA	NA	NA	316000	159000	NA	NA	NA	NA	NA	NA	NA	NA	59600	62000	60500	NA	--
Manganese	NA	NA	NA	NA	NA	NA	**3370**	**1680**	NA	NA	NA	NA	NA	NA	NA	NA	107	**392**	**369**	NA	**300**
Manganese- Soluble	NA	NA	NA	NA	NA	NA	42.9	24.3	NA	NA	NA	NA	NA	NA	NA	NA	59.2	263	ND	NA	**300**
Mercury	NA	NA	NA	NA	NA	NA	0.353 J	0.097 B	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	**0.7**
Nickel	NA	NA	NA	NA	NA	NA	87.5	33.8 B	NA	NA	NA	NA	NA	NA	NA	NA	3.5 B	3.2 B	4.1 B	NA	**100**
Potassium	NA	NA	NA	NA	NA	NA	23600	15300	NA	NA	NA	NA	NA	NA	NA	NA	6240	8310	8210	NA	--
Sodium	NA	NA	NA	NA	NA	NA	**582000**	**461000**	NA	NA	NA	NA	NA	NA	NA	NA	**188000**	**238000**	**248000**	NA	**20000**
Thallium	NA	NA	NA	NA	NA	NA	8.5 B	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	NA	--
Vanadium	NA	NA	NA	NA	NA	NA	80.9	32 B	NA	NA	NA	NA	NA	NA	NA	NA	2.9 B	2.9 B	2.7 B	NA	--
Zinc	NA	NA	NA	NA	NA	NA	999	395	NA	NA	NA	NA	NA	NA	NA	NA	26.2 B	30.3 B	30.9 B	NA	--
Water Quality Parameters (mg/L)																					
Chemical Oxygen Demand	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	ND	20.6	NA	NA	--
Nitrate, mg/L-N	NA	NA	NA	NA	NA	NA	7.6 J	3.4	NA	NA	NA	NA	NA	NA	NA	NA	1.8	0.77	NA	NA	**10**
Sulfate	NA	NA	NA	NA	NA	NA	125	114 J	NA	NA	NA	NA	NA	NA	NA	NA	113 J	114 J	NA	NA	**250**
Field Measurements (units as indicated)																					
pH (units)	NA	NA	7.08	7.26	7.23	7.54	7.22	7.75	7.19	7.42	7.37	7.61	NA	NA	NA	NA	7.09	7.12	7.12	7.39	**6.5 - 8.5**
Temperature (^{o}C)	NA	NA	14.0	16.3	16.3	16.3	10.9	16.0	17.0	17.1	17.0	17.1	NA	NA	NA	NA	10.5	10.4	10.4	9.8	--
Specific Conductance (uS)	NA	NA	3496	4646	3590	3782	3722	3679	4913	3242	2944	4368	NA	NA	NA	NA	1903	1968	1968	1834	--
Turbidity	NA	NA	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	NA	NA	NA	NA	>1000	>1000	>1000	>1000	--
ORP (mV)	NA	NA	20	78	527	49	111	32	529	19	-52	-89	NA	NA	NA	NA	0	0	0	13	--
DO (ppm)	NA	NA	6.69	7.27	3.77	5.92	5.42	6.17	6.6	7.86	4.38	4.8	NA	NA	NA	NA	3.02	3.58	3.58	3.76	--

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Blind duplicate collected from MW-2.
3. Regulatory limits are NYSDEC Class "GA" Groundwater Quality Standards (GWQS) as published in NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June 1998).

Definitions:
ND or U = Parameter not detected above laboratory detection limit.
NA = Parameter not analyzed.
"--" = No standard available.
J = Indicates an estimated value.
B = Value is between the IDL and the CRDL.
D = Compound identified in an analysis at the secondary dilution factor.
* = Indicates analysis is not within quality control limits.
** = Indicates guidance value
N = Spike sample recovery is not within quality control limits.
E = Indicates value estimated or not reported due to the presence of interferences.

BOLD = Sample result exceeds Class GA Groundwater Standard/Guidance Value.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2b

SUMMARY OF GROUNDWATER ANALYTICAL DATA (APRIL 2008)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	Brownfield Cleanup Program Remedial Investigation																GWQS/ GV [3]
	PZ-1	PZ-2	PZ-3	PZ-4	PZ-5	PZ-6	PZ-11	PZ-12	PZ-13	PZ-14	MW-1	MW-3	MW-4	MW-5	MW-6	Blind Dup [2]	
	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	04/24/08	
TCL Volatile Organic Compounds (VOCs) - ug/L																	
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2 NJ	ND	ND	ND	
Cyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6 J	ND	--
cis-1,2-Dichloroethene	ND	ND	**6**	**46**	**160**	**11**	**170**	**230**	**78**	**28**	ND	ND	1.2	**16**	ND	ND	**5**
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	
Methylcyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.78 J	ND	ND	3.6 J	ND	--
Trichloroethene (TCE)	ND	ND	ND	**19**	**20**	2.5 J	**34**	**23**	**25**	**20**	ND	ND	0.6 J	**5.1**	**8.8 J**	ND	**5**
Tetrachloroethene (PCE)	**40**	**120**	**400**	**1900 D**	**3100 DJ**	**390**	**22000 DJ**	**23000 DJ**	**1900 DJ**	**5300 DJ**	**26**	0.55 J	**300 D**	**19000 DJ**	**9400 DJ**	**21 J**	**5**
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.55 J	ND	ND	ND	ND	**5**
Total VOCs	*40*	*120*	*406*	*1965*	*3280*	*404*	*22204*	*23253*	*2003*	*5348*	*26*	*2*	*305*	*19022*	*9415*	*21*	--
Microbial Parameters (cells/mL)																	
Dehalococcoides	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.57	<0.5	NA	NA	--
Vinyl Chloride Reductase	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.22	<0.5	NA	NA	--
Water Quality Parameters (mg/L)																	
Iron- Soluble	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	--
Manganese- Soluble	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.081	0.1	NA	NA	**10**
Nitrate, mg/L-N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.7	5.7	NA	NA	
Sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	118	87.4	NA	NA	
Ethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	
Ethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	
Methane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	0.0022 J	NA	NA	**250**
Field Measurements (units as indicated)																	
pH (units)	7.06	7.38	7.60	7.29	7.22	7.45	7.18	7.21	7.28	7.40	7.73	7.35	7.30	7.33	7.57	NA	**6.5 - 8.5**
Temperature (^{o}C)	15.9	14.0	16.8	13.4	12.1	13.1	12.00	1.00	12.80	11.60	19.4	16.6	18.0	13.8	15.2	NA	--
Specific Conductance (uS)	4854	4143	4416	6293	3710	3998	7975	13	2487	1985	1948	1821	1879	3070	1861	NA	--
Turbidity	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	>1000	NA	--
ORP (mV)	151	163	133	158	122	137	187	201	131	124	193	99	114	-51	-138	NA	--
DO (ppm)	6.35	5.81	4.56	7.63	4.4	4.95	5.17	3.34	5.70	5.61	2.13	4.09	3.27	4.92	2.18	NA	--

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Blind duplicate collected from MW-1.
3. Regulatory limits are NYSDEC Class “GA” Groundwater Quality Standards (GWQS) as published in NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June 1998).

Definitions:

ND = Parameter not detected above laboratory detection limit.
NA = Parameter not analyzed.
"--" = No standard available.
J = Indicates an estimated value.
D = Compound identified in an analysis at the secondary dilution factor.
NJ = Indicates the presence of an analyte that has been "tentatively identifed" and the associated numerical value represents its approximate concentration.

BOLD = Sample result exceeds Class GA Groundwater Standard/Guidance Value.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

SUMMARY OF 2006 SOIL VAPOR ANALYTICAL RESULTS

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	275 Franklin St. (1/20/06)	432 Pearl St. (1/20/06)	432 Pearl St. (11/20/06)		
	Air	Air-1	SGV-1	SGV-2	SGV-3
TCL Volatile Organic Compounds (VOCs) - ug/m3					
1,3-Butadiene	ND	5.8	8.4	9.3	13
Acetone	ND	ND	24	31	29
Dichlorodifluoromethane	ND	3.3	ND	ND	ND
Carbon Disulfide	ND	12	18	5.9	26
n-Hexane	190	70	230	210	170
Methyl Ethyl Ketone	ND	ND	ND	5.3	4.1
Cyclohexane	120	45	210	100	150
2,2,4-Trimethylpentane	ND	6.1	6.1	5.6	15
Benzene	ND	9.9	6.4	13	21
n-Heptane	90	45	140	90	110
Toluene	53	27	5.3	18	29
Tetrachloroethene	14,000	140	ND	21	21
Trichloroethene	70	ND	ND	ND	ND
Trichlorofluoromethane	ND	1.8	ND	ND	ND
1,1,1-Trichloroethane	71	ND	ND	ND	ND
Ethylbenzene	ND	5.2	ND	2.6	ND
Xylene (m,p)	ND	22	4.8	11	21
Xylene (o)	ND	6.5	1.8	4.8	13
Xylene (total)	ND	27	6.5	16	34
4-Ethyltoluene	ND	4.9	ND	2.0	3.7
1,3,5-Trimethylbenzene	ND	2.3	ND	ND	3.4
1,4-Dichlorobenzene	ND	4.1	ND	ND	ND
1,2,4-Trimethylbenzene	ND	6.4	ND	ND	3.7
Styrene	ND	9.8	1.7	ND	ND

Notes:

1. Only those compounds detected above the laboratory reporting limit are presented in this table.

Definitions:

ND= Not detected above laboratory detection limits.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4

SUMMARY OF POST-EXCAVATION CONFIRMATION SOIL/FILL ANALYTICAL RESULTS

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Parameter [1]	Protection of Groundwater SCOs [2]	Sample Location, Depth, and Date												
		Bottom-1 (12.5')	Northwall-1 (9'-12')	Southwall-1 (9'-12')	Bottom-2 (12.5')	Northwall-2 (9'-12')	Southwall-2 (9'-12')	Eastwall-1 (9'-12')	Northwall-3 (9'-12')	Westwall-1 (9'-12')	Westwall-2 (9'-12')	Bottom-3 (12')	Southwall-3 (9'-12')	Eastwall-2 (9'-12')
		12/01/2016			12/02/2016				12/05/2016			12/06/2016		
Volatile Organic Compounds (VOCs) - mg/kg [3]														
1,2-Dichlorobenzene	**1.1**	ND	ND	ND	ND	ND	0.00083 J	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	**0.12**	ND	ND	ND	ND	ND	0.027	0.024	ND	ND	ND	ND	ND	ND
4-methyl-2-pentanone (MIBK)	**--**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002 J	ND
Acetone	**0.05**	ND	ND	ND	0.0016 J	0.0027 J	**0.22**	0.042	**0.17 J**	0.018	0.0056 J	0.0025 J	0.0032 J	0.021
cis-1,2-Dichloroethene	**0.25**	0.04 J	ND	0.057	0.0003 J	0.00026 J	0.0044 J	0.023	ND	0.0021	ND	0.00028 J	0.0083 J	0.0086
Tetrachloroethene	**1.3**	**2.4**	**2.1**	**1.4**	0.064	0.042	0.31	0.0037	**2.3**	0.064	0.081	0.3	0.17	0.18
Trichloroethene	**0.47**	ND	ND	0.014 J	0.00037 J	0.00027 J	0.0012	ND	ND	0.00056 J	ND	ND	0.0035	0.002

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per 6NYCRR Part 375 Soil Cleanup Objectives (SCOs).
3. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparisons to SCOs.

Definitions:

ND = Parameter not detected above laboratory detection limit.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.

Bold = Result exceeds Protection of Groundwater SCO.

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TABLE 5

SUMMARY OF PRE-SVE (2008) & POST-SVE (2009) SOIL ANALYTICAL DATA

275 Franklin Street Site
BCP Site No. C915208
Buffalo, New York

Parameter [1]	275-277 Franklin Street Sample Locations								Restricted Residential SCOs [2]	Unrestricted SCOs [2]
	April 2008 Supplemental RI Data (Pre-SVE)				September 2009 Post-SVE Soil Data					
	MW - 4 (4-6')	MW - 4 (8-10')	MW - 6 (4-6')	MW - 6 (8-10')	MW - 4 (4-6')	MW - 4 (8-10')	MW - 6 (4-6')	MW - 6 (8-10')		
TCL Volatile Organic Compounds (VOCs) - mg/kg [3]										
Methylene chloride	0.009	0.012	0.006	0.006 J	0.0049 J	0.0051 J	0.0046 J	0.0058 J	**100**	**0.05**
Acetone	ND	0.006 J	ND	ND	0.018 J	0.0063 J	0.013 J	0.018 J	**100**	**0.05**
cis-1,2-Dichloroethene	0.003 J	0.006	0.002 J	0.033 J	ND	ND	ND	ND	**100**	**0.25**
Chlorobenzene	ND	ND	ND	ND	0.0024 J,B	0.0023 J,B	0.0021 J,B	0.0022 J,B	**100**	**1.1**
1,2-Dichlorobenzene	ND	0.006	ND	0.11 J	ND	ND	ND	ND	**100**	**1.1**
1,4-Dichlorobenzene	ND	ND	ND	0.012 J	ND	ND	ND	ND	**13**	**1.8**
1,2,4-Trichlorobenzene	ND	ND	ND	0.003 J	ND	ND	ND	ND	--	--
Isopropylbenzene	ND	ND	ND	0.008 J	ND	ND	ND	ND	--	--
Trichloroethene	ND	ND	ND	0.063 J	ND	ND	ND	ND	**21**	**0.47**
Tetrachloroethene	**1.6 D**	**20 DJ**	0.87 D	**2200 DJ**	0.0035 J	0.0022 J	ND	0.0076 J	**19**	**1.3**
Total VOCs	*1.6*	*20*	*0.88*	*2,200*	*0*	*0*	*0*	*0*	--	--

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. Values per NYSDEC Part 375 Restricted-Residential Soil Cleanup Objectives (December 2006).
3. Sample results were reported by the laboratory in ug/kg and converted to mg/kg for comparison to SCOs.

Definitions:
ND = Parameter not detected above laboratory detection limit.
"--" = No SCO available.
D = All compounds were identified in an analyisis at the secondary dilution factor.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
B = Analyte was detected in the associated method blank

BOLD = Sample Result exceeds Unrestricted SCO
BOLD = Sample Result exceeds Restricted Residential SCO

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																											
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	Total TCL cVOCs	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
Shallow Overburden Wells																													
PZ-2	11/16/06	< 10	< 10	< 10	< 10	< 10	<10	90	< 10	<10	**90**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.26	16.3	4646	< 1000	78	7.27
	04/24/08	< 20	< 4	< 4	< 4	< 4	<4.0	120	< 4	<4.0	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.38	14.0	4143	< 1000	163	5.81
	08/18/08	**HRC INJECTION**																											
	10/02/08	8.3	< 1	< 1	4.6	< 1	< 1	230 D	5.7	< 1	**240**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.73	15.7	6981	< 1000	-10	2.39
	12/18/08	< 20	< 4	< 4	3.5	< 4	< 4	270 D	5.6	< 4	**279**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.31	8.3	4977	< 1000	-25	3.32
	02/11/09	< 5	< 1	< 1	1.3 J	< 1	< 1	83	4	< 1	**88**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.28	11.9	4926	18	-56	3.08
	04/21/09	< 5	< 1	< 1	2.3	< 1	< 1	110 D	20	< 1	**132**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.18	12.2	7537	6.3	-60	3.02
	07/17/09	< 5	< 1	< 1	1.2	< 1	< 1	77 D	12	< 1	**90**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.10	16.3	9630	11	-199	2.34
	03/29/10	< 5	< 0.19	< 0.34	< 1	< 1	< 0.44	60	3	< 0.24	**63**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.08	10.5	5814	4.8	-48	3.04
	06/02/11	< 10	< 0.19	< 0.34	3.8	< 0.9	< 0.44	78	9.2	< 0.9	**91**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.42	15.5	4820	10	48	4.2
	06/05/12	< 10	< 0.19	< 0.34	5.7	< 0.9	< 0.44	200 D	13	< 0.9	**219**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.38	15.3	4951	16	336	5.47
PZ-3	11/16/06	< 10	< 10	< 10	1 J	< 10	< 10	300	< 10	< 10	**301**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.23	16.3	3590	< 1000	527	3.77
	04/24/08	< 25	< 5	< 5	6	< 5	< 5	400	< 5	< 5	**406**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.60	16.8	4416	< 1000	133	4.56
	08/18/08	**HRC INJECTION**																											
	10/02/08	< 5	< 1	< 1	3.5	< 1	< 1	370 D	1.7	< 1	**375**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.34	14.0	4801	< 1000	17	4.94
	12/18/08	< 20	< 4	< 4	2.1 J	< 4	< 4	250	< 4	< 4	**252**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40	9.6	4244	< 1000	93	5.29
	02/11/09	< 5	< 1	< 1	< 1	< 1	< 1	140 D	1.2	< 1	**141**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.45	12.0	4667	37	416	5.46
	04/21/09	< 5	< 1	< 1	0.73 J	< 1	< 1	150 D	1 J	< 1	**152**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.35	10.8	4818	307	107	4.86
	07/17/09	< 5	< 1	< 1	< 1	< 1	< 1	72 D	< 1	< 1	**72**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.31	16.1	5436	6.5	-59	5.22
	03/29/10	< 5	< 0.19	< 0.34	< 1	< 1	< 0.44	17	< 1	< 0.24	**17**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.16	10.4	4032	20	-51	4.18
	06/02/11	< 10	< 0.19	< 0.34	< 1	< 1	< 0.44	120 D	< 1	< 1	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.22	14.9	5885	8.0	-15	4.04
	06/05/12	< 10	< 0.38	< 0.68	< 1	< 1	< 0.88	120	< 1	< 1.8	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.50	14.7	4276	17	179	4.84

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																										
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	*Total TCL cVOCs*	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
PZ-4	11/16/06	< 10	< 10	< 10	< 10	< 10	< 10	530	3 J	< 10	**533**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.54	16.3	3782	< 1000	49	5.92
	04/24/08	< 25	< 5	< 5	46	< 5	< 5	1,900 D	19	< 5	**1,965**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.29	13.4	6293	< 1000	158	7.63
	08/18/08	**HRC INJECTION**																											
	10/02/08	< 5	< 1	< 1	56	0.82 J	< 1	2,800 D	30	< 1	**2,888**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40	15.7	5898	< 1000	85	7.33
	12/18/08	< 200	< 40	< 40	99	< 40	< 40	2,800	42	< 40	**2,941**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.38	9.3	10502	< 1000	147	8.97
	02/11/09	< 5	< 1	< 1	16	< 1	< 1	540 D,H	9.4	< 1	**565**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.61	10.7	7079	17	48	9.22
	04/21/09	< 5	< 1	< 1	6	< 1	< 1	520 D	6.3	< 1	**532**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.37	11.7	18510	206	99	9.58
	07/17/09	< 5	< 1	< 1	0.93 J	< 1	< 1	180 D	1.6	< 1	**183**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.61	16.7	12	6.5	-46	6.69
	03/29/10	< 50	< 1.9	< 3.4	< 10	< 10	< 4.4	46 D	< 10	< 2.4	**46**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.61	9.0	6934	13	0	9.37
	06/02/11	< 10	< 0.19	< 0.34	9.1	< 1	< 0.44	390 D	8.1	< 1	**407**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.49	13.5	9095	9.0	36	8.02
	06/05/12	< 50	< 0.95	< 1.7	15	< 1	< 2.2	950 D	24	< 4.5	**989**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.63	14.0	8812	16	289	7.71
	04/16/14	**IET INJECTION**																											
	06/18/14	< 26	< 3.8	< 6.8	39	< 18	< 8.8	1,200	35	< 18	**1,274**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.46	14.9	11710	30	71	4.95
	09/03/14	< 26	< 3.8	< 6.8	190	< 18	11 J	1,200	60	< 18	**1,450**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1.3 J	7.44	18.9	9106	3.2	-77	3.20
	04/16/15	< 26	< 3.8	< 6.8	110	< 18	< 8.8	940	59	< 18	**1,109**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.40	11.9	7306	9.9	-37	7.73
	08/13/15	< 26	< 3.8	< 6.8	160	< 18	11 J	480	61	< 18	**701**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	13	*7.47*	*22.0*	*12.82*	*> 1000*	*-143*	*2.79*
	12/18/15	< 19	< 10	< 7	29	< 7	< 7	780	30	< 0.7	**839**	NA	NA	NA	NA	COD=64	0.04 J	NA	NA	94.6	NA	NA	NA	7.67	11.4	5925	63	22	5.96
	Mar & Apr 2016	**PERSULFOX INJECTIONS**																											
	06/13/16	< 39	< 20	< 14	64	< 14	< 14	1,100	46	< 1.4	**1,210**	NA	NA	NA	NA	COD=240	0.026 J	NA	NA	572	NA	NA	NA	7.07	16.5	10	217	197	5.45
	09/21/16	< 39	< 20	< 14	34 J	< 14	< 14	630	34	< 1.4	**698**	NA	NA	NA	NA	COD=170	< 0.191	NA	NA	273	NA	NA	NA	7.75	26.3	5784	510	321	5.27
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/23/17	< 39	< 20	< 14	58	< 14	< 14	1,000	52	< 1.4	**1,110**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40	10.9	8883	159	184	7.51
	04/24/17	< 39	< 20	< 14	52	< 14	< 14	1,200	44	< 1.4	**1,296**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.71	15.7	7520	47	155	7.96

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																											
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	*Total TCL cVOCs*	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
PZ-5	11/20/06	< 10	< 10	< 10	42	< 10	< 10	9,700	11	< 10	**9,753**	NA	NA	NA	NA	NA	NA	NA	7.6 J	125	NA	NA	NA	7.22	10.9	3722	< 1000	111	5.42
	04/24/08	< 20	< 4	< 4	160	< 4	< 4	3,100 DJ	20	< 4	**3,280**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.22	12.1	3710	< 1000	122	4.4
	08/18/08	**HRC INJECTION**																											
	10/02/08	< 5	< 1	< 1	38	< 1	< 1	3,000 D	7.3	< 1	**3,045**	25.2	0.308 J	0.905	< 0.463	NA	ND	ND	5.2	117	0.0021	ND	0.01	7.33	16.4	3773	< 1000	-37	4.51
	12/18/08	< 200	< 40	< 40	120	< 40	< 40	5,600 D	< 40	< 40	**5,720**	0.8	< 0.667	< 0.667	< 0.667	NA	ND	ND	5.7	120	0.0021	ND	0.014	7.42	11.0	4622	< 1000	-10	5.07
	02/11/09	< 5	< 1	< 1	< 1	< 1	< 1	150 D	< 1	< 1	**150**	1.4	< 5	< 5	< 5	NA	< 0.05	0.00783	4.65	102	< 0.0015	< 0.0015	0.00329	7.48	11.2	2872	15	35	4.74
	04/21/09	< 5	< 1	0.41 J	54	0.4 J	< 1	760 D	8.7	< 1	**823**	0.8	< 0.5	< 0.5	9060	NA	< 0.05	< 0.003	6.4 D	110 D	< 0.0015	< 0.0015	< 0.001	7.41	12.6	3905	38	60	3.11
	07/17/09	< 5	< 1	< 1	33	< 1	< 1	6,000 D	9.3	< 1	**6,044**	2.8	< 0.5	< 0.5	< 0.5	16.6	0.135	1.37	4.44 D	130 D	< 0.0015	< 0.0015	< 0.001	7.26	16.5	4255	44	28	2.95
	03/29/10	< 5	< 0.19	< 0.34	8	< 1	< 0.44	1,300 D	3.1	< 0.24	**1,311**	2.5	< 5	< 5	< 5	NA	< 0.05	0.0064	8.97	114	< 1.5	< 1.5	1	7.32	8.8	4341	4.5	0	4.32
	06/29/11	< 10	< 0.19	< 0.34	11	< 1	< 0.44	3,200 D	4.3	< 0.9	**3,215**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.26	16.6	4802	7.8	50	3.89
	06/05/12	< 10	< 4.8	< 8.5	< 1	< 1	< 11	1,600	< 1	< 23	**1,600**	NA	NA	NA	NA	NA	NA	NA	4.7	135	0.87 J	NA	0.55 BJ	7.34	14.2	3469	13	57	4.73
	04/16/14	**IET INJECTION**																											
	06/18/14	< 33	< 4.8	< 8.5	< 20	< 23	< 11	3,800 D	< 12	< 23	**3,800**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.50	15.3	4135	21	163	5.91
	09/03/14	< 33	< 4.8	< 8.5	< 20	< 23	14 J	2,300	< 12	< 23	**2,314**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.48	17.6	4985	7.1	179	3.67
	04/16/15	< 1.3	< 0.19	< 0.34	33	< 0.9	< 0.44	5.8	2.8	< 0.9	*42*	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	9.3	7.29	11.8	3790	19	-49	7.07
	08/13/15	< 1.3	< 0.19	3	29	< 0.9	< 0.44	1,100 D	3	< 0.9	**1,132**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.54	16.3	4251	8.7	20	5.44
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/24/17	< 19	< 10	< 7	< 7	< 7	< 7	4,700 J	2.7 J	< 0.71	**4,703**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.32	11.5	2752	1.4	237	4.54
	04/24/17	< 19	< 10	< 7	28	< 7	< 7	740	3.4 J	< 0.71	**771**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.48	10.8	2976	7.0	148	5.09
PZ-6	11/16/06	< 10	< 10	< 10	26	< 10	< 10	1,000	5 J	< 10	**1,031**	NA	NA	NA	NA	NA	NA	NA	3.4	114 J	NA	NA	NA	7.75	16.0	3679	< 1000	32	6.17
	04/24/08	< 20	< 4	< 4	11	< 4	< 4	390	2.5 J	< 4	**404**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.45	13.1	3998	< 1000	137	4.95
	08/18/08	**HRC INJECTION**																											
	10/02/08	< 5	< 1	< 1	20	1.3	< 1	1,400 D	8.7	< 1	**1,430**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.45	15.1	3851	< 1000	88	4.99
	12/18/08	< 10	< 2	< 2	1.7	< 2	< 2	92	< 2	< 2	**94**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.49	10.4	3600	< 1000	100	5.28
	02/11/09	< 5	< 1	< 1	< 1	< 1	< 1	12	< 1	< 1	**12**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.48	11.6	2560	140	72	4.49
	04/21/09	< 5	< 1	< 1	2.5	< 1	< 1	200	2.1	< 1	**205**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.36	11.4	4471	31	80	2.98
	07/17/09	< 5	< 1	< 1	0.9 J	< 1	< 1	90	0.52 J	< 1	**91**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.33	16.1	3894	21	28	3.52
	03/29/10	< 5	< 0.19	< 0.34	2	< 1	< 0.44	590 D	1.2	< 0.24	**593**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.26	10.0	4044	39	-64	4.58
	06/29/11	< 10	< 0.19	< 0.34	7	< 1	< 0.44	1,200 D	3.6	< 0.9	**1,211**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.26	16.0	3261	10	63	3.7
	06/05/12	< 10	< 1.5	< 2.7	< 1	< 1	< 3.5	390	< 1	< 7.2	**390**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.39	14.4	2719	23	146	4.31
	04/16/14	**IET INJECTION**																											
	06/18/14	<11	< 1.5	< 2.7	<6.5	<7.2	< 3.5	390	<3.7	< 7.2	**390**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.48	15.1	5029	33	161	6.68
	09/03/14	<6.6	< 0.95	< 1.7	85	<4.5	< 2.2	280	5.6	< 4.5	**371**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.42	17.7	4164	7.6	145	4.07
	04/16/15	<6.6	< 0.95	< 1.7	12	<4.5	< 2.2	210	<2.3	< 4.5	*222*	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.30	13.1	2087	6.8	112	5.31
	08/13/15	< 6.6	< 0.95	3.6 J	37	< 4.5	2.2 J	800 D	9.6	< 4.5	**847**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.69	15.2	3905	15	129	5.42
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/23/17	< 19	< 10	< 7	< 7	< 7	< 7	500	8.2	< 0.71	**508**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.30	12.4	2833	2.7	239	5.04
	04/24/17	< 1.9	< 1	< 0.7	5.8	< 0.7	< 0.7	46	1.3	< 0.07	**53**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.10	10.6	2889	6	172	5.23

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																											
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	*Total TCL cVOCs*	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
	11/16/06	< 10	< 10	1 J	< 10	< 10	<10	4 J	< 10	< 10	**4.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.19	12.0	4713	< 100	29	6
	08/18/08	**HRC INJECTION**																											
PZ-7	03/30/10	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.33	10.6	3915	243	8	8.51
	06/03/11	< 5	< 1	< 1	< 1	< 1	< 1	0.64 J	< 1	< 1	**0.64**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.35	14.2	5456	14	92	6.01
	06/05/12	< 10	< 0.19	2	< 1	< 1	< 0.44	2.1	< 1	< 0.9	**2.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.74	14.9	3145	29	520	8.08
	11/16/06	< 10	<10	1 J	< 10	< 10	<10	4 J	< 10	< 10	**4.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.42	17.1	3242	< 100	119	7.86
	08/18/08	**HRC INJECTION**																											
PZ-8	03/30/10	< 5	<1.0	<1.0	< 1	< 1	<1.0	1.9	< 1	<1.0	**1.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.78	11.3	3943	29	10	8.34
	06/02/11	< 5	<1.0	0.7 J	< 1	< 1	< 0.44	1.9	< 1	< 0.9	**2.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.72	14.4	2283	12	76	6.23
	06/04/12	< 10	< 0.19	0.58 J	< 1	< 1	< 0.44	1.9	< 1	< 0.9	**2.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.00	14.5	1516	14	561	8.09
	11/16/06	< 10	< 10	1 J	< 10	< 10	<10	10	< 10	< 10	**10**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.37	170.0	2944	< 100	-52	4.38
	08/18/08	**HRC INJECTION**																											
PZ-9	03/30/10	< 25	< 5	< 5	< 5	< 5	< 5	9 D	< 5	< 5	**9.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.46	9.8	7571	25	22	8.91
	06/03/11	< 10	< 0.19	0.85 J	< 5	< 5	< 0.44	6.8	< 5	< 0.9	**6.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.35	14.2	5456	14	92	6.01
	06/04/12	< 10	< 0.19	< 0.34	< 1	< 1	< 0.44	6.6	< 1	< 0.9	**6.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.73	13.4	6535	202	614	7.51
	11/16/06	< 10	<10	1 J	< 10	< 10	<10	2 J	< 10	< 10	**2.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.01	17.1	4368	< 100	-89	4.8
	08/18/08	**HRC INJECTION**																											
PZ-10	03/30/10	< 5	< 1	<1.0	< 1	< 1	< 1	0.73 J	< 1	< 1	**0.73**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.88	11.6	3027	140	12	8.54
	06/03/11	< 5	< 0.19	< 0.34	< 1	< 1	< 0.44	0.53 J	< 1	< 0.9	**0.53**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.51	13.6	9522	40	93	7.89
	06/04/12	< 10	< 0.19	< 0.34	< 1	< 1	< 0.44	1	< 1	< 0.9	**1.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.84	13.6	3300	47	552	7.14
	01/05/07	< 50	<50	<50	94	< 50	<50	18,000 D	< 50	< 50	**18,094**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.22	11.2	2865	< 1000	110	5.46
	04/24/08	< 2000	< 400	< 400	170	< 400	< 400	22,000 D	34	< 400	**22,204**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.18	12.0	7975	< 1000	187	5.17
	08/18/08	**HRC INJECTION**																											
	03/30/10	< 20	< 4	< 4	12 D	< 4	< 4	6,800 D	5.9 D	< 4	**6,818**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.25	8.3	9696	54	5	6
	06/02/11	< 10	< 0.19	< 0.34	17	< 1	< 0.44	5,400 D	5.6	< 0.9	**5,423**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.46	13.2	6102	47	99	4.08
	06/04/12	< 500	< 9.5	< 17	< 50	< 50	< 22	3,400	< 50	< 45	**3,400**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.51	14.4	4076	< 1000	564	4.36
PZ-11	**04/16/14**	**IET INJECTION**																											
	06/18/14	< 26	< 3.8	< 6.8	< 16	< 18	< 8.8	1,500	< 9.2	< 18	**1,500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.75	17.8	4937	43	125	3.35
	09/03/14	< 6.6	< 0.95	< 1.7	14	< 4.5	< 2.2	480	5.8	< 4.5	**500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.41	18.0	4627	46	84	3.25
	04/16/15	< 6.6	< 0.95	< 1.7	95	< 4.5	< 2.2	16,000 D	34	< 4.5	*16,129*	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.30	11.7	5334	11	110	5.7
	08/13/15	< 260	< 38	< 68	< 160	< 180	100 J	4,300	< 92	< 180	**4,300**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.51	20.3	5909	30	7	3.45
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/24/17	< 190	< 100	< 70	< 70	< 70	< 70	5,500	< 18	< 7.1	**5,500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.49	10.8	3815	9.0	241	2.42
	04/24/17	< 190	< 100	< 70	< 70	< 70	< 70	5,600	< 18	< 7.1	**5,600**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.50	11.2	6943	9.4	120	5.19

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																											
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	*Total TCL cVOCs*	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
PZ-12	01/05/07	< 200	<200	<200	< 200	< 200	<200	7,200 D	< 200	< 200	**7,200**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.03	11.5	3083	< 1000	103	4.00
	04/24/08	< 25	< 5	< 5	230	< 5	< 5	23,000 D	23	< 5	**23,253**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.21	13.0	4004	< 1000	201	3.34
	08/18/08	**HRC INJECTION**																											
	03/30/10	< 50	<10	<10	7.4 DJ	< 10	<10	1,100 D	12 D	<10	**1,119**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.30	9.4	3741	< 1000	7	2.38
	06/02/11	< 10	< 0.19	< 0.34	5.7	< 1	< 0.44	4,300 D	4.3	< 0.9	**4,310**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.38	13.6	3294	100	89	2.57
	06/04/12	< 100	< 1.9	< 3.4	56	< 10	< 4.4	700	14	< 9	**770**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.51	14	3324	268	431	2.61
	04/16/14	**IET INJECTION**																											
	06/18/14	< 13	< 1.9	< 3.4	< 8.1	< 9	< 4.4	3,700 D	< 4.6	< 9	**3,700**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.48	15.3	3177	36	157	2.89
	09/03/14	< 26	< 3.8	< 6.8	< 16	< 18	< 8.8	2,200 D	< 9.2	< 18	**2,200**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.44	18.0	3564	9.9	68	1.97
	04/16/15	< 53	< 7.6	< 14	75	< 36	< 18	6,200 D	20 J	< 36	*6,295*	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.22	10.9	3877	22	127	5.09
	08/13/15	< 66	< 9.5	< 17	66	< 45	25 J	1,900 D	< 23	< 45	**1,991**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.52	19.8	3552	74	15	2.12
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/24/17	< 48	< 25	< 18	26 J	< 18	< 18	2,500	8.8 J	< 1.8	**2,535**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.46	11.2	3403	15	244	3.35
	04/24/17	< 39	< 20	< 14	14 J	< 14	< 14	1,900	7.8 J	< 1.4	**1,922**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.60	12.8	3197	12	99	3.38
PZ-13	01/05/07	< 10	< 10	< 10	1 J	< 10	< 10	180	< 10	< 10	**181**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.11	11.9	3304	< 1000	68	5.18
	04/24/08	< 20	< 4	< 4	78	< 4	< 4	1,900 D	25	< 4	**2,003**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.28	12.8	2487	< 1000	131	5.7
	08/18/08	**HRC INJECTION**																											
	03/30/10	< 5	< 1	< 1	20	< 1	<1.0	98	11	1.2	**130**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.11	10.1	3721	87	-91	2.24
	06/02/11	< 5	< 0.19	< 0.34	9.6	< 1	< 0.44	120	4.5	< 0.9	**134**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.54	14.3	3130	469	-79	2.36
	06/04/12	< 20	< 0.38	< 0.68	7.4	< 2	< 0.88	280 D	7.1	< 1.8	**295**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.49	13.8	4080	667	344	3.5
	04/16/14	**IET INJECTION**																											
	06/18/14	< 10	< 0.19	0.54 J	6.4	< 1	< 0.44	78	0.94 J	< 0.9	**86**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	10	7.98	18.7	3762	55	78	2.05
	09/03/14	< 1.3	< 0.19	< 0.34	4.7	< 0.9	< 0.44	15	2.0	< 0.9	**22**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	4.8	7.52	17.8	3256	9.6	-95	1.77
	04/16/15	53	0.27 J	0.62 J	1300 D	1.4	< 0.44	55,000 D	490 E	< 0.9	*56,791*	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 15	< 15	510	7.31	11.4	4266	22	105	5.45
	08/13/15	53 J	< 1.9	< 3.4	450	< 9	< 4.4	44 D	< 4.6	52	**546**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 75	< 75	6,400	7.42	19.1	6651	12	-143	1.25
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/24/17	< 3.9	< 2	< 1.4	50	5.0	< 1.4	79	19	18	**171**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.13	11.3	5482	8.1	-10	2.28
	04/24/17	< 19	< 10	< 7	500	10 J	< 7	14	20	110	**654**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.50	14.9	4829	14.0	0	2.98

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																											
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	*Total TCL cVOCs*	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
PZ-14	01/05/07	< 10	<10	<10	6 J	< 10	<10	3,000 D	< 10	< 10	**3,007**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40	11.3	1798	< 1000	56	5.5
	04/24/08	< 20	< 4	< 4	28	< 4	< 4	5,300 D	20	< 4	**5,348**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40	11.6	1985	< 1000	124	5.61
	08/18/08	**HRC INJECTION**																											
	04/08/10	< 25	< 5	< 5	30	< 5	0.55 J	1,100 D	10	< 5	**1,140**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.18	11.8	4756	46	64	2.49
	06/02/11	< 10	< 0.19	< 0.34	9.2	< 1	< 0.44	2,100 D	5.8	< 0.9	**2,115**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.81	13.3	3861	< 1000	104	6.1
	06/04/12	< 250	< 4.8	< 8.5	26	< 25	< 11	1,200	12 J	< 23	**1,238**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.73	13	4500	16	555	8.07
	04/16/14	**IET INJECTION**																											
	06/19/14	< 26	< 3.8	< 6.8	< 16	< 18	< 8.8	910	15 D J	< 18	**925**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	8.19	16.8	2230	36	108	4.00
	09/03/14	< 26	< 3.8	< 6.8	89	< 18	8.9 J	1300	61	< 18	**1,450**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.80	18.7	3397	87	-142	4.66
	04/16/15	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/13/15	< 26	< 3.8	< 6.8	270	< 18	10 J	590	36	< 18	**896**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 75	< 75	560	7.62	20.8	4894	736	-126	1.58
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/24/17	.	< 1	< 0.7	290 D	14	< 0.7	4.8	12	130	**451**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.32	10.9	4397	8.9	-70	2.47
	04/24/17	< 7.8	< 4	< 2.8	180	8.5 J	< 2.8	4.7	140	140	**473**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.08	15.0	4276	35.1	-126	1.81
MW-5	04/25/08	< 5	< 1	< 1	16	< 1	< 1	19,000 D J	5.1	< 1	**19,022**	<0.5	NA	NA	<0.5	NA	ND	0.1	5.7	87.4	ND	ND	0.0022	7.33	13.8	3070	< 1000	-51	4.92
	08/18/08	**HRC INJECTION**																											
	10/02/08	< 5	< 1	< 1	20	< 1	< 1	50,000 D	7.2	< 1	**50,032**	5.23	0.116 J	5.8	< 0.461	NA	ND	0.0099	8.1	85.8	ND	ND	ND	7.27	13.7	3454	2213	-40	6.27
	12/18/08	< 2500	<500	<500	< 500	< 500	<500	34,000 D	< 500	< 1	**34,000**	0.6	< 0.8	< 0.8	< 0.8	NA	ND	1.2	4.4	58.8	ND	ND	ND	6.99	10.4	4089	NA	-76	2.87
	02/11/09	4.9 J	< 1	< 1	66	< 1	< 1	36,000 D,H	19	< 1	**36,088**	2.6	< 1.6	< 1.6	7.7	NA	< 0.05	0.91	5.57	84.4	< 0.0015	< 0.0015	< 0.001	7.17	13.4	5153	13	-71	2.14
	04/21/09	11	0.82 J	0.53 J	1	0.64 J	< 1	37,000 D	27	< 1	**37,032**	2.2	< 1	< 1	< 1	NA	< 0.05	1.8	5.19 D	98 D	< 0.0015	< 0.0015	2.2	7.22	13.7	4730	2.6	-115	1.23
	07/17/09	< 5	< 1	0.54 J	800	1	< 1	31,000 D	86	< 1	**31,890**	0.5 J	< 0.7	< 0.7	< 0.7	1.8	0.557	0.246	6.57 D	110 D	< 0.0015	< 0.0015	< 0.001	7.02	15.5	5656	2.0	-100	1.98
	03/29/10	< 500	< 97	< 170	< 500	< 500	< 220	25,000 D	< 500	< 120	**25,000**	4	< 5	< 5	< 5	NA	< 0.05	0.495	7.35	89.2 B	< 1.5	< 1.5	1	6.81	11.3	6748	3.3	-71	4.26
	06/02/11	< 10	< 0.19	< 0.34	4.8	< 1	< 0.44	49,000 D	12	< 1	**49,021**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.26	13.1	5350	6.0	-23	6
	06/05/12	< 10	< 150	< 270	< 1	< 1	< 350	70,000	< 1	< 720	**70,000**	NA	NA	NA	NA	NA	NA	4.5	NA	126	NA	NA	0.38 BJ	7.20	13.4	4892	3.4	593	4.58
	04/16/14	**IET INJECTION**																											
	06/19/14	< 260	< 38	< 68	< 160	< 180	< 88	17,000	170 D J	< 180	**17,170**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.66	18.9	4929	60	-169	1.65
	09/03/14	< 260	< 38	< 68	6300	< 180	< 88	38,000 D	2700	< 180	**47,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	1.7 J	210 D	7.41	17.0	4462	9.6	-156	0.81
	04/16/15	< 1300	< 190	< 340	1700	< 900	< 440	43,000	670 J	< 900	**45,370**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 15	< 15	520	7.32	12.9	4335	22	-132	1.5
	08/13/15	< 1300	< 190	< 340	870 J	< 900	< 440	120,000 D	< 460	< 900	**120,870**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 75	< 75	1,600	7.46	17.7	4964	39	-122	1.29
	12/18/15	< 1900	< 1000	< 700	910 J	< 700	< 700	190,000	350 J	< 70	**191,260**	NA	NA	NA	NA	COD=62	2.9	NA	NA	75	NA	NA	NA	7.57	11.4	3642	> 100	-51	1.12
	Mar & Apr 2016	**PERSULFOX INJECTIONS**																											
	06/13/16	< 9700	< 5000	< 3500	< 3500	< 3500	< 3500	180,000	< 880	< 350	**180,000**	NA	NA	NA	NA	COD=87	0.017 J	NA	NA	312	NA	NA	NA	7.18	17.3	6387	96.4	17	1.02
	09/21/16	< 3900	< 2000	< 1400	< 1400	< 1400	< 1400	110,000	470 J	< 140	**110,470**	NA	NA	NA	NA	COD=78	< 0.191	NA	NA	810	NA	NA	NA	7.17	21.6	6903	60.2	-130	1.38
MW-5R	**12/1-12/6/16**	**ON-SITE EXCAVATION**																											
	01/23/17	< 39	< 20	< 14	< 14	< 14	< 14	990	20	< 1.4	**1,010**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.97	12.1	6444	24.2	361	1.18
	04/24/17	< 97	< 50	< 35	160	< 35	< 35	3,600	55	< 3.6	**3,815**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.08	15.3	6542	83.2	319	1.31

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275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																											
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	Total TCL cVOCs	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
Intermediate Overburden Wells																													
MW-1	12/08/06	< 10	< 10	< 10	2 J	< 10	64 DJ	4100	21	< 10	**4,123**	NA	NA	NA	NA	NA	NA	NA	1.8	113 J	NA	NA	NA	7.09	10.5	1903	< 1000	0	3.02
	04/24/08	< 5	< 1	< 1	< 1	< 1	< 1	26	< 1	< 1	**26**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.73	19.4	1948	< 1000	193	2.13
	08/18/08	**HRC INJECTION**																											
	10/02/08	23	1.9	0.65 J	<1.0	< 1	< 1	29	0.51 J	< 1	**30**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.90	12.5	2502	363	5	1.76
	12/18/08	21	< 1	< 1	15	< 1	< 1	32	0.87 J	< 1	**48**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.64	11.5	2217	-13	25.2	0.067
	02/11/09	11	< 1	< 1	20	< 1	< 1	8.4	< 1	< 1	**28**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.86	13.3	2064	10	-98	0.98
	04/21/09	4.3 J	0.98 J	< 1	16	< 1	< 1	12	0.58 J	< 1	**29**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.70	14.1	1914	67	-248	0.41
	07/17/09	< 5	6.5	< 1	9.1	< 1	< 1	3.9	< 1	< 1	**13**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.04	15.0	1945	4.1	-273	0.59
	03/29/10	< 5	< 0.19	< 0.34	33	< 1	< 0.44	93	0.78 J	< 0.24	**127**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.63	11.9	2093	50	-193	1.58
	06/02/11	< 10	< 0.19	< 0.34	14	< 1	< 0.44	43	< 1	< 0.9	**57**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.01	14.3	2070	13	-195	0.95
	06/05/12	< 10	< 0.19	< 0.34	5	< 1	< 0.44	62	0.71 J	< 0.9	**68**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.19	14.2	2153	7.5	-158	0.92
	08/13/15	< 1.3	< 0.19	< 0.34	1.9	< 0.9	< 0.44	1.6	< 0.46	< 0.9	**4.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.47	14.6	2384	16	-82	1.32
MW-2	12/08/06	< 10	< 10	< 10	< 10	< 10	< 10	5 J	< 10	< 10	**5.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.89	9.2	1774	122	16	1.6
	08/18/08	**HRC INJECTION**																											
	03/30/10	< 5	< 0.19	< 0.34	< 1	< 1	< 0.44	6.5	< 1	< 0.24	**6.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.34	12.8	3492	63	5	3.35
	06/03/11	< 5	< 0.19	< 0.34	< 1	< 1	< 0.44	0.76 J	< 1	< 0.9	**0.76**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.23	15.4	2837	8.4	87	1.53
	06/04/12	< 10	< 0.19	< 0.34	< 1	< 1	< 0.44	0.81 J	< 1	< 0.9	**0.81**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.47	14.3	3410	4.1	574	2.34
	08/13/15	< 1.3	< 0.19	0.37 J	< 0.81	< 0.9	< 0.44	110 D	< 0.46	< 0.9	**110**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.52	17.4	2263	50	-34	2.15
MW-3	12/08/06	< 10	< 10	< 10	< 10	< 10	< 10	6 J	< 10	< 10	**6.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.91	9.6	1746	231	82	2.16
	04/24/08	< 5	< 1	< 1	< 1	< 1	< 1	0.55 J	< 1	< 1	**0.55**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.35	16.6	1821	< 1000	99	4.09
	08/18/08	**HRC INJECTION**																											
	03/30/10	< 5	< 0.19	< 0.34	< 1	< 1	< 0.44	7.1	< 1	< 0.24	**7.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.05	11.8	2109	17	-93	1.97
	06/02/11	< 5	< 0.19	< 0.34	< 1	< 1	< 0.44	9.1	< 1	< 0.9	**9.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.30	15.0	2000	7	-63	1.6
	06/04/12	< 10	< 0.19	< 0.34	< 1	< 1	< 0.44	1.1	< 1	< 0.9	**1.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.50	13.6	2024	7.4	473	3.4
	08/13/15	< 1.3	< 0.19	< 0.34	< 0.81	< 0.9	0.44	93	< 0.46	< 0.9	**93**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.46	18.8	2225	2.4	27	1.59
Deep Overburden Wells																													
MW-4	04/24/08	< 5	< 1	< 1	1.2	< 1	< 1	300 D	0.6 J	< 1	**302**	0.57	NA	NA	0.22 J	NA	ND	0.081	1.7	118	ND	ND	ND	7.30	18.0	1879	< 1000	114	3.27
	08/18/08	**HRC INJECTION**																											
	10/02/08	17	1.1	< 1	4	< 1	< 1	11	< 1	< 1	**15**	28.3	< 2.99	3.73	< 2.99	NA	20.6	1.8	0.38	96.4	ND	ND	0.0025	6.23	13.5	2830	178	-46	1.71
	12/18/08	25	< 1	< 1	4.6	< 1	< 1	7.1	< 1	< 1	**12**	1.2	< 1.1	< 1.1	< 1.1	NA	21.8	1.5	0.37	63.9	ND	ND	0.014	5.90	11.2	2821	NA	-76	0.84
	02/11/09	28	< 1	< 1	6.3	< 1	< 1	2	< 1	< 1	**8**	13.2	< 1.6	< 1.6	7.7	NA	15.4	0.676	0.372	65.4	< 0.0015	< 0.0015	0.0333	6.17	13.4	2435	20	-132	0.93
	04/21/09	20	0.41 J	< 1	1.6	< 1	< 1	1.9	< 1	< 1	**4**	1.5 J	< 2.5	< 2.5	< 2.5	NA	10.4	0.321	0.551	61	< 0.3	< 0.3	0.85	6.50	4.9	2003	16	-198	0.68
	07/17/09	19	0.61 J	< 1	2	< 1	< 1	73	< 1	< 1	**75**	NA	NA	NA	NA	NA	2.37	0.278	< 0.05	64	< 1.5	< 1.5	6.1	6.64	16.2	2642	15	-185	0.64
	03/29/10	< 5	< 0.19	< 0.34	1.3	< 1	< 0.44	4.8	< 1	< 0.24	**6.1**	21.8	< 2.2	< 2.2	< 2.2	NA	< 0.05	0.139	0.586	97.8	< 1.5	< 1.5	5.5	7.01	11.3	2161	6.6	-118	1.29
	06/02/11	< 10	< 0.19	< 0.34	< 1	< 1	< 0.44	2.4	< 1	< 1	**2.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.29	13.9	2053	8.0	-82	8
	06/05/12	< 10	< 0.19	< 0.34	2.5	< 1	< 0.44	120 D	3.3	< 0.9	**126**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.19	14.0	2156	4.5	21	2.57
	08/13/15	< 1.3	< 0.19	< 0.34	1.6	< 0.9	< 0.44	1.0	< 0.46	< 0.9	**2.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.39	16.2	2339	14	-59	1.56

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		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	*Total TCL cVOCs*	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
MW-6	04/25/08	< 20	< 4	< 4	< 4	< 4	< 4	9400 D	8.8 J	< 4	**9409**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.57	15.2	1861	< 1000	-138	2.18
	08/18/08	**HRC INJECTION**																											
	10/02/08	43	< 1	< 1	44	< 1	< 1	53	9.5	< 1	**107**	33.2	< 1.23	7.01	0.588 J	NA	15.8	0.97	0.32	420	ND	ND	ND	6.57	13.7	2475	3669	-51	1.94
	12/18/08	130	< 1	< 1	150 D	1.2	< 1	21	< 1	< 1	**172**	14.5	< 5	< 5	< 5	NA	48.7	3	ND	ND	ND	ND	0.0066	5.79	11.8	3911	NA	0.111	0.78
	02/11/09	45 D	< 1	< 1	270 D	< 1	< 1	22 D	17 D	< 1	**309**	5.7	< 2.4	< 2.4	4.4	NA	35.5	1.75	< 0.05	13.4	< 0.0015	< 0.0015	0.257	5.91	12.9	3565	46	-102	1.53
	04/21/09	29	0.52 J	< 1	130 D	1.5	< 1	43	14	< 1	**189**	2.1 J	< 2.4	< 2.4	2.6	NA	7.44	0.671	0.011 J	4.7	< 1.5	< 1.5	< 1	6.64	14.5	2394	31	-142	0.93
	07/17/09	11 DJ	2.5 DJ	<4.0	240 D	< 4	3.1 DJ	17 D	3.8 D	<4.0	**261**	0.8 J	< 1.3	< 1.3	0.4 J	NA	< 0.05	< 0.003	0.42	83	< 1.5	< 1.5	6.4 D	7.04	15.0	2156	16	-131	2.32
	03/29/10	< 10	< 0.39	< 0.67	28 D	< 2	< 0.88	140 D	36 D	< 0.49	**204**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.11	12.0	2261	12	-85	2.51
	06/02/11	< 10	< 0.19	< 0.34	29	< 1	< 0.44	200 D	19 D	< 0.9	**248 D**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.20	14.3	2066	13	-90	1.72
	06/05/12	< 10	< 0.38	< 0.68	6	< 1	< 0.88	91	42	< 1.8	**139**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.31	13.8	2217	16	5	2.52
	08/13/15	< 1.3	< 0.19	< 0.34	12	< 0.9	< 0.44	1.2	1.3	< 0.9	**15**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40	15.5	2268	27	-71	1.28
MW-7	**08/18/08**	**HRC INJECTION**																											
	06/05/12	< 10	< 0.19	< 0.34	51	< 1	< 0.44	18	< 1	< 0.9	**69**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.26	13.9	2089	29	1.7	85
	08/14/15	910	50	< 6.8	38	< 18	13 J	< 7.2	< 9.2	< 18	**38**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--
Off-Site NYSDEC Wells (S = shallow, D = deep) [3]																													
MW-21S	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	0.75 J	< 1	< 1	< 1	< 1	< 1	< 1	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 10	< 5	< 5	< 5	< 5	<5.0	< 5	< 5	< 5	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
MW-21D	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	1.4 J	< 1	< 1	< 1	< 1	< 1	< 1	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
MW-22S	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
MW-22D	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	0.92 J	< 1	< 1	< 1	< 1	< 1	< 1	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
MW-23S	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	0.64 J	47	< 1	< 1	560 D	3.6	< 1	**611**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 50	< 50	< 50	< 50	< 50	< 50	650	< 50	< 50	**650**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/04/12	< 10	< 0.19	< 0.34	11	< 1	< 0.44	1800 D	4.1	< 0.9	**1,815**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.63	11.8	3366	47	482	2.35
	04/16/14	**IET INJECTION**																											
	09/03/14	< 1.3	< 0.19	0.47 J	5.7	< 0.9	< 0.44	1400 D	3.4	< 0.9	**1,409**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.32	17.2	2755	51	26	0.82
	04/16/15	< 66	< 9.5	17	250	< 45	< 22	1200	72	< 45	*1,522*	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	9.4	7.41	9.6	3441	25	45	3.17
	08/14/15	< 66	< 9.5	< 17	60	< 45	33 J	1300	93	< 45	**1,486**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	5.2	7.25	17.4	4791	16	150	1.18
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/23/17	< 19	< 10	< 7	7.1 J	< 7	< 7	470	10	< 0.71	**487**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.20	13.1	4083	0.87	186	3.11
	04/24/17	< 19	< 10	< 7	26	< 7	< 7	660	15	< 0.71	**701**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.31	11.8	2792	15.2	71	1.49

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date		Parameter [1]																											
		TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
		2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	*Total TCL cVOCs*	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]		**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
MW-23D	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	0.66 J	< 1	< 1	< 1	3.4	< 1	< 1	**3.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	07/30/15	< 1.3	< 0.19	< 0.34	< 0.81	< 0.9	< 0.44	< 0.36	< 0.46	< 0.9	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
MW-24S	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	< 1	5.8	< 1	< 1	180 D	35	< 1	**221**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 100	< 50	< 50	< 50	< 50	< 50	1300	< 50	< 50	**1,300**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/04/12	< 10	< 0.19	< 0.34	2.2	< 1	< 0.44	2900 D	1.1	< 0.9	**2,903**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.51	13.1	3198	60	300	1.74
	04/16/14	**IET INJECTION**																											
	09/03/14	< 1.3	0.55 J	4.5	15	< 0.9	< 0.44	68,000	420 J	< 0.9	**68,436**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.39	15.9	2592	19	80	0.73
	04/16/15	< 1300	< 190	< 340	< 810	< 900	< 440	24000 D	< 460	< 900	***24,000***	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	< 1	7.33	13.0	2477	21	36	1.77
	08/14/15	< 1300	< 190	< 340	< 810	< 900	590 J	22,000	< 460	< 900	**22,590**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	2.6 J	< 1	7.31	16.2	2408	12	-16	1.63
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/23/17	< 190	< 100	< 70	< 70	< 70	< 70	9,000	35 J	< 7.1	**9,035**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40	13.0	2425	4.1	81	1.97
	04/24/17	< 390	< 200	< 140	< 140	< 140	< 140	9,300	< 35	< 14	**9,300**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.49	15.0	2785	19.7	20	1.31
MW-24D	**08/18/08**	**HRC INJECTION**																											
	05/28/09	< 5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/07/11	< 10	< 5	< 5	11	< 5	< 5	3 J	< 5	< 5	**14**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	06/04/12	< 10	< 0.19	< 0.34	100 D	< 1	< 0.44	1.1	< 1	< 0.9	**101**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.60	13.6	2400	35	-69	1.68
	04/16/14	**IET INJECTION**																											
	09/03/14	< 1.3	< 0.19	< 0.34	26	< 0.9	< 0.44	1.3	0.52 J	< 0.9	**28**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.35	15.5	2097	17	-102	1.02
	04/16/15	< 6.6	< 0.95	< 1.7	33	< 4.5	< 2.2	180	6.1	< 4.5	**219**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	39	7.30	9.1	2821	17	30	3.07
	07/30/15	< 1.3	< 0.19	< 0.34	160	< 0.9	< 0.44	15	3.2	< 0.9	**178**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	08/14/15	< 2.6	< 0.38	< 0.68	89	< 1.8	1.2 J	45	3.2	< 1.8	**137**	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.5	40	7.16	16.1	2275	15	-51	1.55
	12/1-12/6/16	**ON-SITE EXCAVATION**																											
	01/23/17	< 1.9	< 1	< 0.7	48	< 0.7	< 0.7	4.0	2.2	< 0.07	**54**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.32	12.3	2315	3.2	47	1.76
	04/24/17	< 1.9	< 1	< 0.7	83	< 0.7	< 0.7	2.7	4.9	< 0.07	**91**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.33	15.9	2210	27.2	-92	1.20

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 6

SUMMARY OF PRE- AND POST-REMEDIAL GROUNDWATER ANALYTICAL RESULTS (2006-2017)

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location & Sample Date	Parameter [1]																											
	TCL Volatile Organic Compounds (ug/L)										Microbial Parameters (cells/mL)				Water Quality Parameters (mg/L)								Field Measurements (units as indicated)					
	2-Butanone (MEK)	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Methylene chloride	Tetrachloroethene	Trichloroethene	Vinyl chloride	Total TCL cVOCs	Dehalococcoides	TCE R-Dase	BAV1 VC R-Dase	Vinyl Chloride Reductase (VC R-Dase)	Total Organic Carbon (TOC)	Iron- Soluble	Manganese- Soluble	Nitrate, mg/L-N	Sulfate	Ethane	Ethene	Methane	pH (units)	Temperature (°C)	Specific Conductance (uS)	Turbidity	ORP (mV)	DO (ppm)
GWQS [2]	**50**	**--**	**7**	**5**	**5**	**5**	**5**	**5**	**2**	**--**	**--**	**--**	**--**	**--**		**300**	**300**	**10**	**250**	**--**	**--**	**250**	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
MW-25S	**08/18/08**	**HRC INJECTION**																										
	10/24/12	< 1.3	< 0.19	0.43 J	2.9	< 0.9	< 0.44	1900	6.6	< 0.9	**1,910**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	04/16/14	**IET INJECTION**																										
	07/30/15	< 5.3	< 0.76	< 1.4	200	< 3.6	< 1.8	300	10	17	**527**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	03/01/17	<5.3	<0.76	< 1.4	190 F1	< 3.6	< 1.8	56	5.2	36	**287**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	05/11/17	< 5.3	< 0.76	< 1.4	310	< 3.6	< 1.8	46	5.8	< 3.6	**362**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
MW-26S	**08/18/08**	**HRC INJECTION**																										
	10/24/12	< 1.3	< 0.19	< 0.34	5.4	< 0.9	< 0.44	3100	12	< 0.9	**3,117**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	04/16/14	**IET INJECTION**																										
	07/30/15	< 5.3	< 0.76	< 1.4	3.6 J	< 3.6	1.8	350	3.7 J	< 3.6	**357**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	03/01/17	< 5.3	< 0.76	< 1.4	110	<3.6	<1.8	4500 D	85	<3.6	**4,695**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	05/11/17	< 110	< 15	< 27	130	< 72	< 35	4500	76 J	< 72	**4,706**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
MW-27S	**08/18/08**	**HRC INJECTION**																										
	10/24/12	< 1.3	< 0.19	0.63 J	< 0.81	< 0.9	< 0.44	1.7	< 0.46	< 0.9	**1.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	04/16/14	**IET INJECTION**																										
	07/30/15	< 1.3	< 0.19	0.36 J	< 0.81	< 0.9	< 0.44	1.4	< 0.46	< 0.9	**1.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)
	05/11/17	< 1.3	< 0.19	0.47 J	< 0.81	< 0.9	< 0.44	1.7 F1	< 0.46	< 0.9	**2.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(4)	(4)	(4)	(4)	(4)	(4)

Notes:

1. Only those parameters detected above their specific GWQS at a minimum of one sample location are presented. Some additional parameters were detected but not included due to low concentrations and sporadic detection.
2. Groundwater Quality Standard (GWQS) per NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1.
3. Groundwater data for the May 2009, June 2011, October 2012, and July 2015 events obtained from NYSDEC. The additional sampling events were performed by Benchmark.
4. Field parameter results were not provided by the NYSDEC.

Definitions:

< 0.19 = Parameter not detected above laboratory method detection limit.
NA = Sample not analyzed for parameter.
"--" = No groundwater quality standard available.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
b = Analyte was detected in the associated blank as well as in the sample. Value is above the action level for consideration as being external contamin
B = Indicates a value greater than or equal to the instrument detection limit, but less than the quantitation limit.
D = Analyzed at dilution
NS = Not sampled due to car parked over well; several attempts to sample were made over a 2-week period.
* = Indicates the spike or duplicate analysis is not within the quality control limits.
D = All compounds were identified in an analyisis at the secondary dilution factor.
N = Indicates spike sample recovery is not within the quality control limits.
E = Result exceeds calibration range.
P = Detected concentrations between the two GC columns is greater than 25%; lower value is reported and flagged (for CLP methodology only).
H = Initial analysis within holding time. Reanalysis for the required dilution was past holding time.
"+" = Additional analytes detected but not included in this table are: 2-hexanone (31 J ug/L) and acetone (920 ug/L)
F1 = MS and/or MSD recovery is outside acceptable limits.

Poor quality of groundwater prevented sample measurement
Insufficient sample to collect final field parameter measurements; values measured before sample collected.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 10

GROUNDWATER MONITORING PROGRAM

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Sample Location	Field Measurements						cVOCs	Dissolved Gases		
	pH	Temperature	Specific Conductance	Oxidation-Reduction Potential	Dissolved Oxygen	Water Level	TCL VOCs Method 8260B	Ethene	Ethane	Methane
On-Site Monitoring Wells										
PZ-4	x	x	x	x	x	x	x	x	x	x
PZ-5	x	x	x	x	x	x	x	x	x	x
PZ-6	x	x	x	x	x	x	x	x	x	x
PZ-11	x	x	x	x	x	x	x	x	x	x
PZ-12	x	x	x	x	x	x	x	x	x	x
PZ-13	x	x	x	x	x	x	x	x	x	x
PZ-14	x	x	x	x	x	x	x	x	x	x
MW-5	x	x	x	x	x	x	x	x	x	x
Off-Site Monitoring Wells										
MW-21S						x				
MW-22S						x				
MW-23S	x	x	x	x	x	x	x	x	x	x
MW-24S	x	x	x	x	x	x	x	x	x	x
MW-24D	x	x	x	x	x	x	x	x	x	x

Notes:

1. Semi-Annual Monitoring Events: October 2017, April/October 2018, and April 2019
2. Annual Monitoring Events: April 2020 and 2021
3. Water levels will be measured in all on-site wells and piezometers during each sampling event.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 11

SUMMARY OF MONITORING WELL / PIEZOMETER CONSTRUCTION DETAILS [1,2]

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Location [3]	Groundwater Unit	Installation Date	Well Diameter (inches)	Well Construction Material (screen/riser)	TOR Elevation (fmsl)	Ground Elevation (fmsl)	Stick-up (fbgs)	Construction Details (approx.)				Total Depth March 2010 (fbTOR)
								Bentonite Seal (fbgs)	Sand Pack Interval (fbgs)	Screened Interval (fbgs)	Sump Interval (fbgs)	
MONITORING WELLS:												
MW-1	intermediate	11/27/06	2.0	PVC / PVC	499.22	499.51	-0.29	1.00 - 26.67	26.67 - 38.67	28.67 - 38.67	none	38.67
MW-2	intermediate	11/28/06	2.0	PVC / PVC	499.81	500.08	-0.27	1.00 - 26.37	26.37 - 38.37	28.37 - 38.37	none	38.37
MW-3	intermediate	11/29/06	2.0	PVC / PVC	498.13	498.38	-0.25	1.00 - 25.92	25.92 - 37.92	27.92 - 37.92	none	37.92
MW-4	deep	04/22/08	2.0	PVC / PVC	499.56	499.93	-0.37	1.00 - 30.27	30.27 - 47.27	32.27 - 47.27	47.27 - 50.27	50.27
MW-5R	shallow	01/18/17	2.0	PVC / PVC	499.20	499.50	-0.30	1.00 - 6.79	6.79 - 18.79	8.79 - 18.79	none	18.79
MW-6	deep	04/24/08	2.0	PVC / PVC	498.72	499.03	-0.31	1.00 - 31.10	31.10 - 48.10	33.10 - 48.10	48.10 - 50.10	50.10
MW-7	deep	05/30/12	2.0	PVC / PVC	497.96	498.31	-0.35	26.28 - 31.28	31.28 - 48.28	33.28 - 48.28	48.28 - 50.28	50.28
PIEZOMETERS:												
PZ-1	*Destroyed*											
PZ-2	shallow	11/14/06	1.0	PVC / PVC	499.70	499.84	-0.14	1.00 - 3.52	3.52 - 15.52	5.52 - 15.52	none	15.52
PZ-3	shallow	11/14/06	1.0	PVC / PVC	499.32	499.44	-0.12	1.00 - 3.48	3.48 - 15.48	5.48 - 15.48	none	15.48
PZ-4	shallow	11/14/06	1.0	PVC / PVC	499.42	499.66	-0.24	1.00 - 3.47	3.47 - 15.47	5.47 - 15.47	none	15.47
PZ-5	shallow	11/14/06	1.0	PVC / PVC	498.65	498.92	-0.27	1.00 - 3.37	3.37 - 15.37	5.37 - 15.37	none	15.37
PZ-6	shallow	11/14/06	1.0	PVC / PVC	499.10	499.21	-0.11	1.00 - 3.42	3.42 - 15.42	5.42 - 15.42	none	15.42
PZ-7	shallow	11/15/06	1.0	PVC / PVC	500.95	501.13	-0.18	1.00 - 3.32	3.32 - 15.32	5.32 - 15.32	none	15.32
PZ-8	shallow	11/15/06	1.0	PVC / PVC	500.16	500.37	-0.21	1.00 - 3.17	3.17 - 15.17	5.17 - 15.17	none	15.17
PZ-9	shallow	11/15/06	1.0	PVC / PVC	498.79	499.01	-0.22	1.00 - 3.27	3.27 - 15.27	5.27 - 15.27	none	15.27
PZ-10	shallow	11/15/06	1.0	PVC / PVC	498.80	499.03	-0.23	1.00 - 2.37	2.37 - 14.37	4.37 - 14.37	none	14.37
PZ-11	shallow	12/27/06	1.0	PVC / PVC	497.79	498.18	-0.39	1.00 - 3.37	3.37 - 15.37	5.37 - 15.37	none	15.37
PZ-12	shallow	12/27/06	1.0	PVC / PVC	497.60	498.14	-0.54	1.00 - 3.37	3.37 - 15.37	5.37 - 15.37	none	15.37
PZ-13	shallow	12/27/06	1.0	PVC / PVC	497.88	498.47	-0.59	1.00 - 2.87	2.87 - 14.87	4.87 - 14.87	none	14.87
PZ-14	shallow	12/27/06	1.0	PVC / PVC	497.92	498.26	-0.34	1.00 - 2.72	2.72 - 14.72	4.72 - 14.72	none	14.72
OFF-SITE MONITORING WELLS (INSTALLED BY NYSDEC):												
MW-21S	shallow	05/13/09	2.0	PVC / PVC	497.36	497.88	-0.52	9.50 - 11.50	11.50 - 23.50	13.50 - 23.50	none	23.50
MW-21D	deep	05/12/09	2.0	PVC / PVC	497.58	497.90	-0.32	34.50 - 36.50	36.50 - 48.50	38.50 - 48.50	none	48.50
MW-22S	shallow	05/15/09	2.0	PVC / PVC	496.21	497.23	-1.02	3.00 - 5.00	5.00 - 17.70	7.70 - 17.70	none	17.70
MW-22D	deep	05/14/09	2.0	PVC / PVC	496.92	497.21	-0.29	33.50 - 36.00	36.00 - 48.00	38.00 - 48.00	none	48.00
MW-23S	shallow	05/19/09	2.0	PVC / PVC	496.91	497.46	-0.55	4.56 - 6.56	6.56 - 18.56	8.56 - 18.56	none	18.56
MW-23D	deep	05/19/09	2.0	PVC / PVC	497.18	497.52	-0.34	34.30 - 36.30	36.30 - 48.30	38.30 - 48.30	none	48.30
MW-24S	shallow	05/21/09	2.0	PVC / PVC	497.32	497.91	-0.59	4.63 - 6.63	6.63 - 18.63	8.63 - 18.63	none	18.63
MW-24D	deep	05/20/09	2.0	PVC / PVC	497.63	497.94	-0.31	33.53 - 35.53	35.53 - 47.53	37.53 - 47.53	none	47.53
MW-25S	shallow	09/27/12	2.0	PVC / PVC	496.21	496.46	-0.25	5.60 - 7.60	7.60 - 19.10	9.10 - 19.10	none	19.10
MW-26S	shallow	09/26/12	2.0	PVC / PVC	496.02	496.39	-0.37	4.80 - 6.80	6.80 - 18.80	8.80 - 18.80	none	18.80
MW-27S	shallow	09/27/12	2.0	PVC / PVC	496.24	497.10	-0.86	5.10 - 7.10	7.10 - 19.10	9.10 - 19.10	none	19.10

Notes:

1. Top of riser elevation based upon an assumed datum of 500.00 fmsl.
2. TOR = top of riser.
3. fmsl = feet above mean sea level.
4. fbgs = feet below ground surface.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 12

GROUNDWATER ELEVATION DATA SUMMARY

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location	TOR Elevation (fmsl)	Interim Remedial Measure																Post-Injection Monitoring										Post-Persulfox Monitoring				Post Excavation	
		10/02/08		12/18/08		02/11/09		04/21/09		07/17/09		03/29/10		06/02/11		06/04/12		06/18/14		09/17/14		04/16/15		08/13/15		12/18/15		06/13/16		09/21/16		01/23/17	
		DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE	DTW	GWE
MONITORING WELLS (SHALLOW):																																	
MW-5	499.10	12.10	487.00	11.96	487.14	11.95	487.15	11.90	487.20	11.84	487.26	11.76	487.34	11.66	487.44	11.78	487.32	11.80	487.30	11.86	487.24	11.95	487.15	12.00	487.10	12.40	486.70	12.30	486.80	12.03	487.07	(8)	(8)
MW-5R	499.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.56	487.64
MONITORING WELLS (INTERMEDIATE):																																	
MW-1	499.22	12.79	486.43	11.53	487.69	11.10	488.12	11.43	487.79	11.82	487.40	12.40	486.82	11.64	487.58	11.40	487.82	NM	NM	11.87	487.35	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-2	499.81	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	12.05	487.76	12.06	487.75	12.05	487.76	NM	NM	12.10	487.71	NM	NM	12.32	487.49	NM	NM	NM	NM	NM	NM	NM	NM
MW-3	498.13	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.80	487.33	10.46	487.67	10.49	487.64	NM	NM	10.69	487.44	NM	NM	10.80	487.33	NM	NM	NM	NM	NM	NM	NM	NM
MONITORING WELLS (DEEP):																																	
MW-4	499.12	12.26	486.86	12.15	486.97	12.30	486.82	11.94	487.18	12.03	487.09	11.80	487.32	11.56	487.56	11.89	487.23	NM	NM	12.04	487.08	NM	NM	12.05	487.07	NM	NM	NM	NM	NM	NM	NM	NM
MW-6	498.63	11.39	487.24	11.51	487.12	12.30	486.33	11.36	487.27	11.26	487.37	11.10	487.53	10.88	487.75	11.07	487.56	NM	NM	11.29	487.34	NM	NM	11.45	487.18	NM	NM	NM	NM	NM	NM	NM	NM
MW-7	497.96	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.68	487.28	NM	NM	car parked on well		NM	NM	11.45	486.51	NM	NM	NM	NM	NM	NM	NM	NM
PIEZOMETERS:																																	
PZ-1	500.04	12.27	487.77	12.10	487.94	12.13	487.91	12.06	487.98	(7)	(7)	12.00	488.04	11.98	488.06	destroyed																	
PZ-2	499.70	12.09	487.61	11.90	487.80	12.00	487.70	11.86	487.84	(7)	(7)	11.90	487.80	11.88	487.82	11.72	487.98	NM	NM	11.77	487.93	12.29	487.41	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
PZ-3	499.32	11.73	487.59	11.61	487.71	11.60	487.72	11.56	487.76	11.39	487.93	11.49	487.83	11.37	487.95	11.47	487.85	NM	NM	11.64	487.68	11.73	487.59	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
PZ-4	499.42	11.88	487.54	11.67	487.75	11.80	487.62	11.65	487.77	(7)	(7)	11.60	487.82	11.51	487.91	11.64	487.78	11.64	487.78	11.56	487.86	12.08	487.34	11.85	487.57	12.30	487.12	11.90	487.52	11.70	487.72	11.36	488.06
PZ-5	498.65	11.27	487.38	11.12	487.53	11.15	487.50	11.05	487.60	(7)	(7)	11.00	487.65	11.87	486.78	10.95	487.70	11.10	487.55	11.21	487.44	11.28	487.37	11.50	487.15	NM	NM	NM	NM	NM	NM	11.20	487.45
PZ-6	499.10	11.55	487.55	11.43	487.67	(6)	(6)	11.31	487.79	11.11	487.99	11.30	487.80	10.78	488.32	11.26	487.84	11.50	487.60	11.36	487.74	11.43	487.67	11.60	487.50	NM	NM	NM	NM	NM	NM	11.15	487.95
PZ-7	500.95	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	12.50	488.45	12.26	488.69	12.32	488.63	NM	NM	12.49	488.46	12.56	488.39	11.70	489.25	NM	NM	NM	NM	NM	NM	NM	NM
PZ-8	500.16	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	11.90	488.26	11.74	488.42	11.97	488.19	NM	NM	11.99	488.17	12.12	488.04	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
PZ-9	498.79	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	11.00	487.79	10.80	487.99	11.03	487.76	NM	NM	11.22	487.57	10.77	488.02	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
PZ-10	498.80	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.55	488.25	10.31	488.49	10.77	488.03	NM	NM	10.69	488.11	10.82	487.98	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
PZ-11	498.02	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.50	487.52	10.41	487.61	10.49	487.53	10.60	487.42	10.53	487.49	10.84	487.18	10.75	487.27	NM	NM	NM	NM	NM	NM	10.13	487.89
PZ-12	497.93	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.50	487.43	10.47	487.46	10.54	487.39	10.75	487.18	10.49	487.44	10.91	487.02	10.90	487.03	NM	NM	NM	NM	NM	NM	10.76	487.17
PZ-13	498.05	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.55	487.50	10.53	487.52	10.66	487.39	10.80	487.25	10.88	487.17	11.03	487.02	11.00	487.05	NM	NM	NM	NM	NM	NM	11.06	486.99
PZ-14	497.92	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.50	487.42	10.40	487.52	10.52	487.40	10.60	487.32	10.60	487.32	car parked on well		10.90	487.02	NM	NM	NM	NM	NM	NM	10.74	487.18
OFF-SITE MONITORING WELLS:																																	
MW-21S	497.36	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.19	487.17	9.97	487.39	10.06	487.30	NM	NM	NM	NM	NM	NM	NM	NM
MW-22S	496.21	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	9.80	486.41	10.26	485.95	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-23S	496.91	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	11.24	485.67	11.46	485.45	11.50	485.41	NM	NM	NM	NM	NM	NM	11.41	485.50
MW-24S	497.32	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.63	486.69	10.59	486.73	10.70	486.62	NM	NM	NM	NM	NM	NM	11.54	485.78
MW-24D	497.63	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	11.34	486.29	11.30	486.33	11.45	486.18	NM	NM	NM	NM	NM	NM	11.19	486.44

Notes:

1. All wells/piezometers surveyed on 1/11/07 with site specific datum of 500 feet, with the exception of wells MW-4, 5, 5R, 6, and 7; these locations were surveyed following their installation.
2. DTW = depth to water, feet below top of riser (fbTOR)
3. GWE = groundwater elevation, feet above mean sea level (fmsl)
4. NM = no measurement; location was not installed at the time of measurement or not accessible.
5. TOR = top of PVC riser, fmsl
6. Monitoring location was frozen within road box, no measurement was obtained.
7. No measurement obtained due to malfunctioning water level indicator.
8. MW-5 was removed 12/1/2016 during source area excavation and replaced by MW-5R on 1/18/2017.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 12A

GROUNDWATER ELEVATION DATA SUMMARY

275 Franklin Street & 432 Pearl Street Sites
BCP Sites No. C915208 & C915237
Buffalo, New York

Monitoring Location	TOR Elevation (fmsl)	Post Excavation	
		04/24/17	
		DTW	GWE
MONITORING WELLS (SHALLOW):			
MW-5	499.10	(6)	(6)
MW-5R	499.20	11.56	487.64
MONITORING WELLS (INTERMEDIATE):			
MW-1	499.22	NM	NM
MW-2	499.81	NM	NM
MW-3	498.13	10.49	487.64
MONITORING WELLS (DEEP):			
MW-4	499.12	NM	NM
MW-6	498.63	11.29	487.34
MW-7	497.96	NM	NM
PIEZOMETERS:			
PZ-1	500.04	destroyed	
PZ-2	499.70	11.70	488.00
PZ-3	499.32	11.32	488.00
PZ-4	499.42	11.03	488.39
PZ-5	498.65	11.03	487.62
PZ-6	499.10	11.19	487.91
PZ-7	500.95	12.14	488.81
PZ-8	500.16	11.69	488.47
PZ-9	498.79	NM	NM
PZ-10	498.80	10.48	488.32
PZ-11	497.79	10.25	487.54
PZ-12	487.31	10.29	477.02
PZ-13	487.53	10.35	477.18
PZ-14	497.92	10.48	487.44
OFF-SITE MONITORING WELLS:			
MW-21S	497.36	9.78	487.58
MW-22S	496.21	10.07	486.14
MW-23S	496.91	11.19	485.72
MW-24S	497.32	10.33	486.99
MW-24D	497.63	11.70	485.93

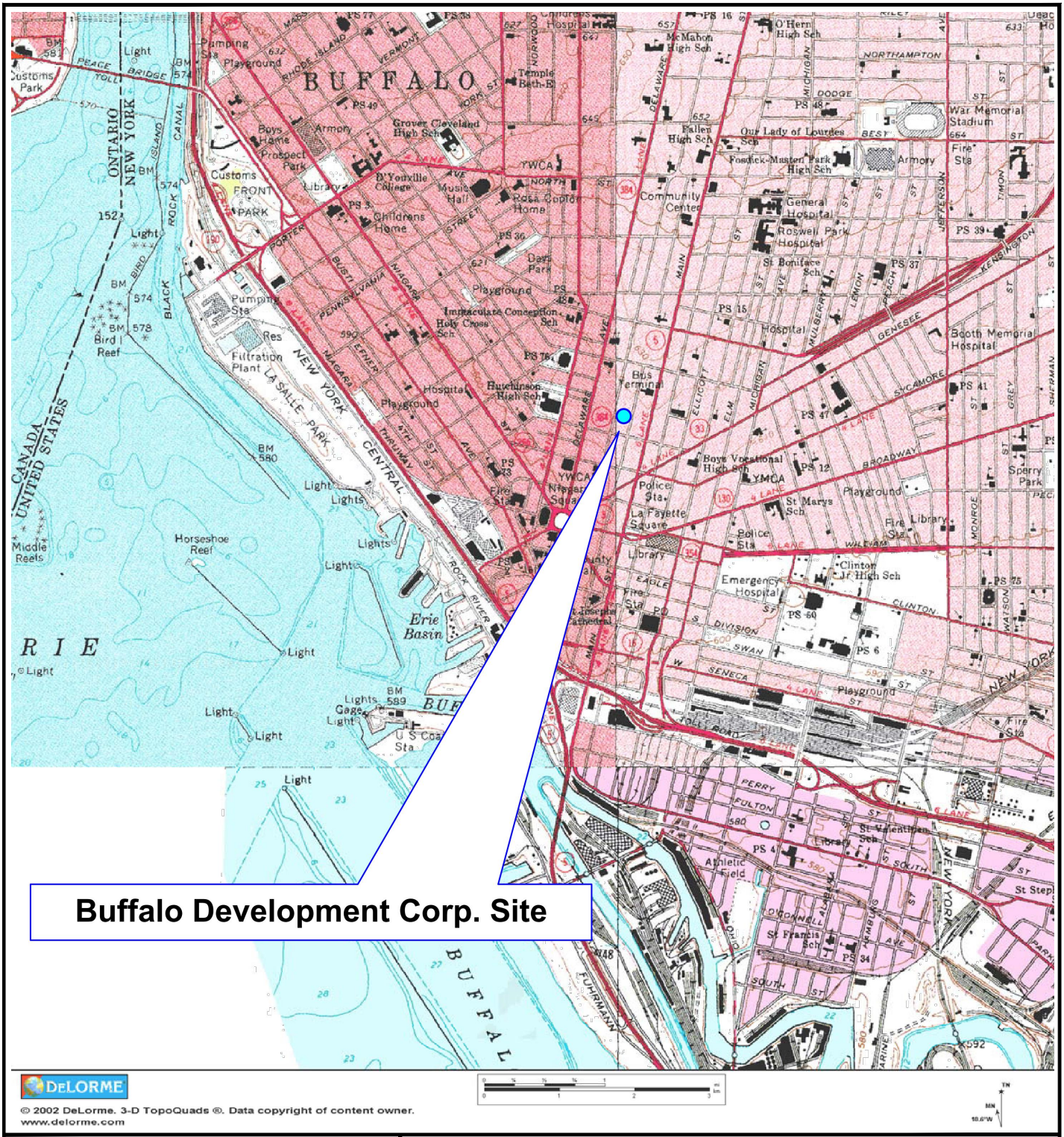
Notes:

1. All wells/piezometers surveyed on 1/11/07 with site specific datum of 500 feet, with the exception of wells MW-4, 5, 5R, 6, and 7; these locations were surveyed following their installation.
2. DTW = depth to water, feet below top of riser (fbTOR)
3. GWE = groundwater elevation, feet above mean sea level (fmsl)
4. NM = no measurement; location was not installed at the time of measurement or not accessible.
5. TOR = top of PVC riser, fmsl
6. MW-5 removed 12/1/2016 during source area excavation and replaced by MW-5R on 1/18/2017.
7. PZ-11, PZ-12, and PZ-13 were cut down to sit flush with ground surface on 4/21/17. TOR elevation was recalculated and used in calculating water elevations for sampling on 4/24/17.

FIGURES

F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 1; Site Location and Vicinity Map.dwg

FIGURE 1



BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0156-016-002

DATE: MAY 2017

DRAFTED BY: BCH

SITE LOCATION AND VICINITY MAP

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

PREPARED FOR

BUFFALO DEVELOPMENT CORPORATION

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F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 2- Site Plan.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE

DATE: MAY 2017
DRAFTED BY: BCH

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: 0156-016-002

SITE PLAN

SITE MANAGEMENT PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237
PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

FIGURE 2

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F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 3 - Shallow Groundwater Isopotential Map (April 2017).dwg

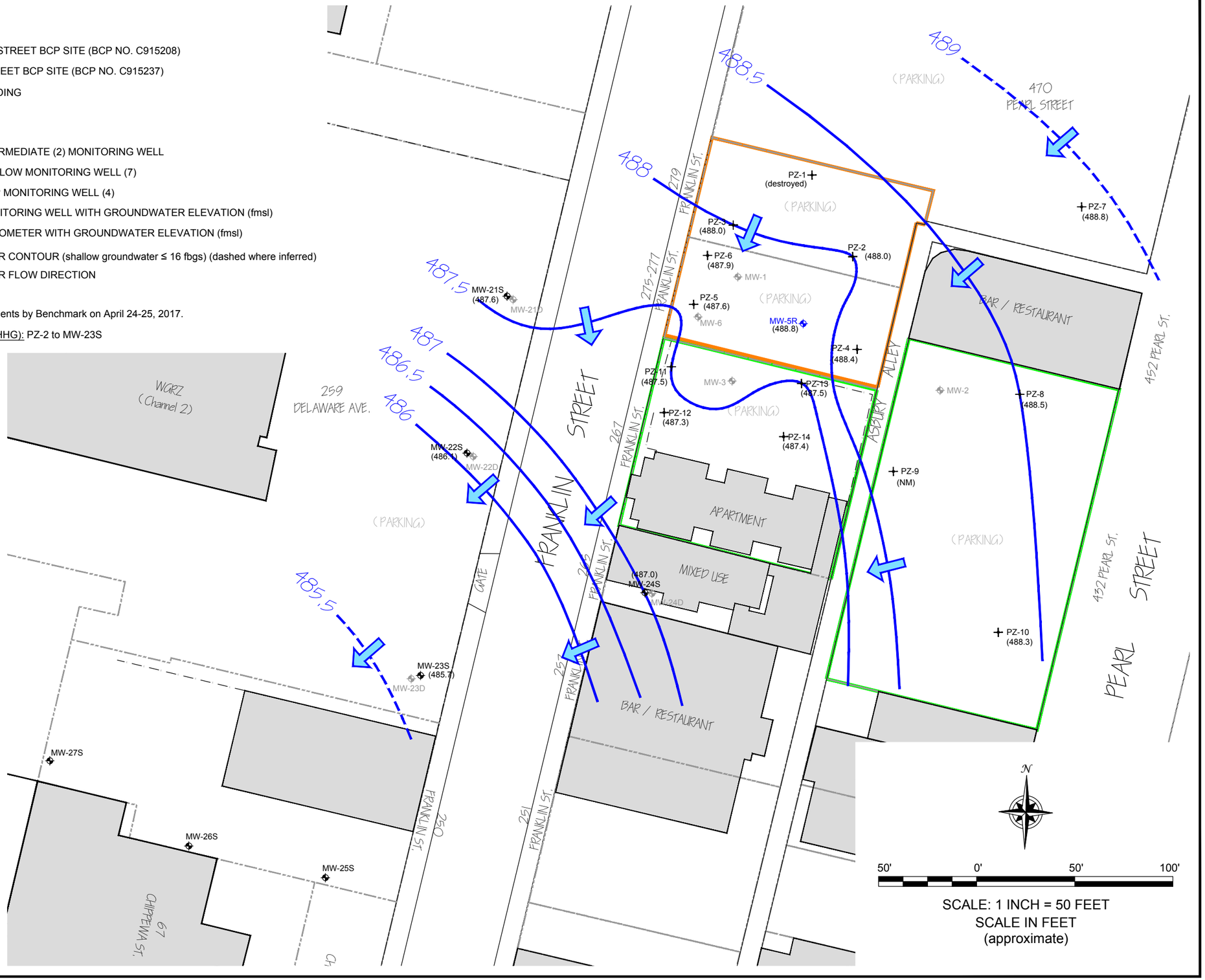
LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- MW-1 — DEEP (1) / INTERMEDIATE (2) MONITORING WELL
- MW-21S (487.17) — OFF-SITE SHALLOW MONITORING WELL (7)
- MW-21D — OFF-SITE DEEP MONITORING WELL (4)
- MW-5R (487.24) — SHALLOW MONITORING WELL WITH GROUNDWATER ELEVATION (fmsl)
- PZ-4 (487.86) — SHALLOW PIEZOMETER WITH GROUNDWATER ELEVATION (fmsl)
- 488 — GROUNDWATER CONTOUR (shallow groundwater ≤ 16 fbgs) (dashed where inferred)
- GROUNDWATER FLOW DIRECTION

Note: Depth to water measurements by Benchmark on April 24-25, 2017.

Horizontal Hydraulic Gradient (HHG): PZ-2 to MW-23S

HHG = ΔH / L
L = 306.7 feet
ΔH = 488.0 - 485.7 = 2.3 feet
HHG = 0.007 ft/ft



SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

DATE: MAY 2017
DRAFTED BY: BCH

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: 0156-016-002

SHALLOW GROUNDWATER ISOPOTENTIAL MAP - APRIL 2017

SITE MANAGEMENT PLAN

275 FRANKLIN STREET SITE
BUFFALO, NEW YORK
BCP NO. C915208

PREPARED FOR

BUFFALO DEVELOPMENT CORPORATION

FIGURE 3

DISCLAIMER:
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F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 4; Investigation Sample Locations.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- HISTORIC SOIL BORING (4) (Nature's Way, September 2004)
- SB-1 SOIL BORING (13)
- AIR SGV-1 SOIL VAPOR SAMPLE (5)
- MW-5 SHALLOW MONITORING WELL (1)
- MW-1 INTERMEDIATE MONITORING WELL (3)
- MW-4 DEEP MONITORING WELL (2)
- PZ-1 SHALLOW PIEZOMETER (14)
- BMW-3 ABANDONED TEMP. MONITORING WELL (2) (Nature's Way, Sept. 2004)
- MW-21S OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, July 2009)
- MW-21D OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, July 2009)
- MW-25S OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)

DATE: JULY 2014
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BENCHMARK ENVIRONMENTAL ENGINEERING SCIENCE, PLLC
2558 HAMBURG TURNPIKE
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BUFFALO, NY 14218
(716) 856-0599

JOB NO.: 0156-016-002

INVESTIGATION SAMPLE LOCATIONS

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BCP NO. C915208 & C915237
BUFFALO, NEW YORK

PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

FIGURE 4

F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 5; 2014 IET Injection Point Locations.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PZ-1 PIEZOMETER
- MW-5 MONITORING WELL
- IP-09A 2014 INJECTION POINT APPROXIMATE LOCATIONS
- ASSUMED RADIUS OF influence FROM IET, INC. APRIL 2014 TECHNOLOGY DISCUSSION AND FIELD REPORT

N

30' 0' 30' 60'

SCALE: 1 INCH = 30 FEET
SCALE IN FEET
(approximate)

DATE: MAY 2017
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JOB NO.: 0156-016-002

2014 IET INJECTION POINT LOCATIONS

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

FIGURE 5

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F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 6; 2016 PersulfOx Injection Point Locations.dwg

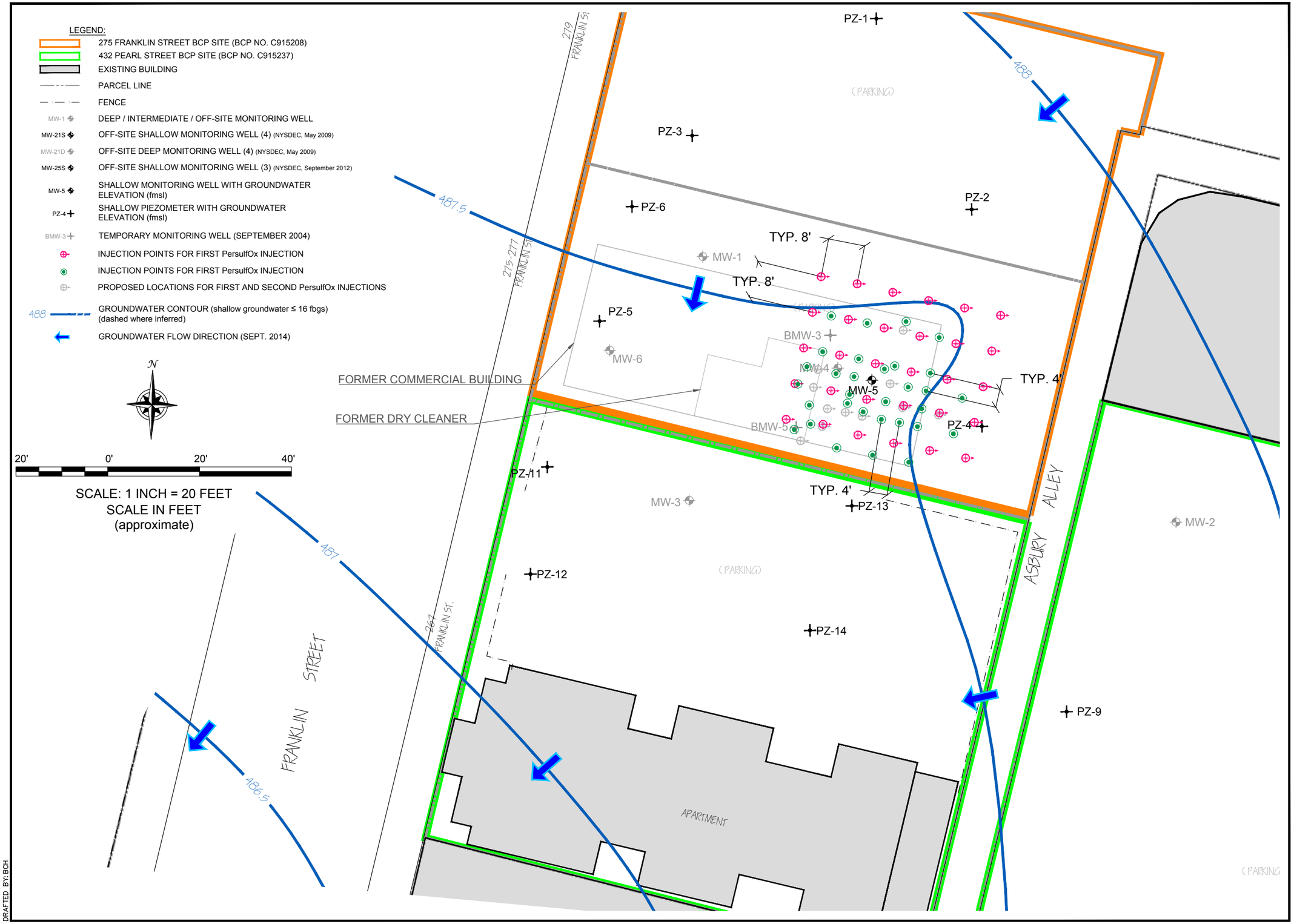
LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- MW-1 — DEEP / INTERMEDIATE / OFF-SITE MONITORING WELL
- MW-21S — OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, May 2009)
- MW-21D — OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, May 2009)
- MW-25S — OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)
- MW-5 — SHALLOW MONITORING WELL WITH GROUNDWATER ELEVATION (fmsl)
- PZ-4 — SHALLOW PIEZOMETER WITH GROUNDWATER ELEVATION (fmsl)
- BMW-3 — TEMPORARY MONITORING WELL (SEPTEMBER 2004)
- INJECTION POINTS FOR FIRST PersulfOx INJECTION
- INJECTION POINTS FOR FIRST PersulfOx INJECTION
- PROPOSED LOCATIONS FOR FIRST AND SECOND PersulfOx INJECTIONS
- 488 — GROUNDWATER CONTOUR (shallow groundwater ≤ 16 fbgs) (dashed where inferred)
- GROUNDWATER FLOW DIRECTION (SEPT. 2014)

N

20' 0' 20' 40'

SCALE: 1 INCH = 20 FEET
SCALE IN FEET
(approximate)



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JOB NO.: 0156-016-002

2016 PERSULFOX INJECTION POINTS

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

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FIGURE 6

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F:\CAD\BenchmarK\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 7; 2016 Remedial Excavation Area.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- FORMER DRY CLEANER BUILDING
- PARCEL LINE
- FENCE
- EXTENT OF REMEDIAL EXCAVATION AREA (DECEMBER 2016)
- SS — APPROXIMATE LOCATION OF SANITARY SEWER LINE (FOUND DURING DECEMBER 2016 EXCAVATION; ENDS CAPPED WITH CONCRETE AT EDGE OF EXCAVATION)
- MW-1 — DEEP / INTERMEDIATE / OFF-SITE MONITORING WELL
- MW-21S — OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, May 2009)
- MW-21D — OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, May 2009)
- MW-25S — OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)
- MW-5 — SHALLOW MONITORING WELL
- PZ-4 — SHALLOW PIEZOMETER
- MW-5 — ABANDONED MONITORING WELL (2)

NOTES:

1. Deep well MW-4 and shallow well MW-5 were decommissioned in December 2016.

POST-EXCAVATION SAMPLE LOCATIONS:

B = BOTTOM SAMPLE
NW = NORTH WALL SAMPLE
EW = EAST WALL SAMPLE
SW = SOUTH WALL SAMPLE
WW = WEST WALL SAMPLE

N

20' 0' 20' 40'

SCALE: 1 INCH = 20 FEET
SCALE IN FEET
(approximate)

DATE: MAY 2017
DRAFTED BY: BCH

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JOB NO.: 0156-016-002

2016 REMEDIAL EXCAVATION AREA

SITE MANAGEMENT PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

PREPARED FOR
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FIGURE 7

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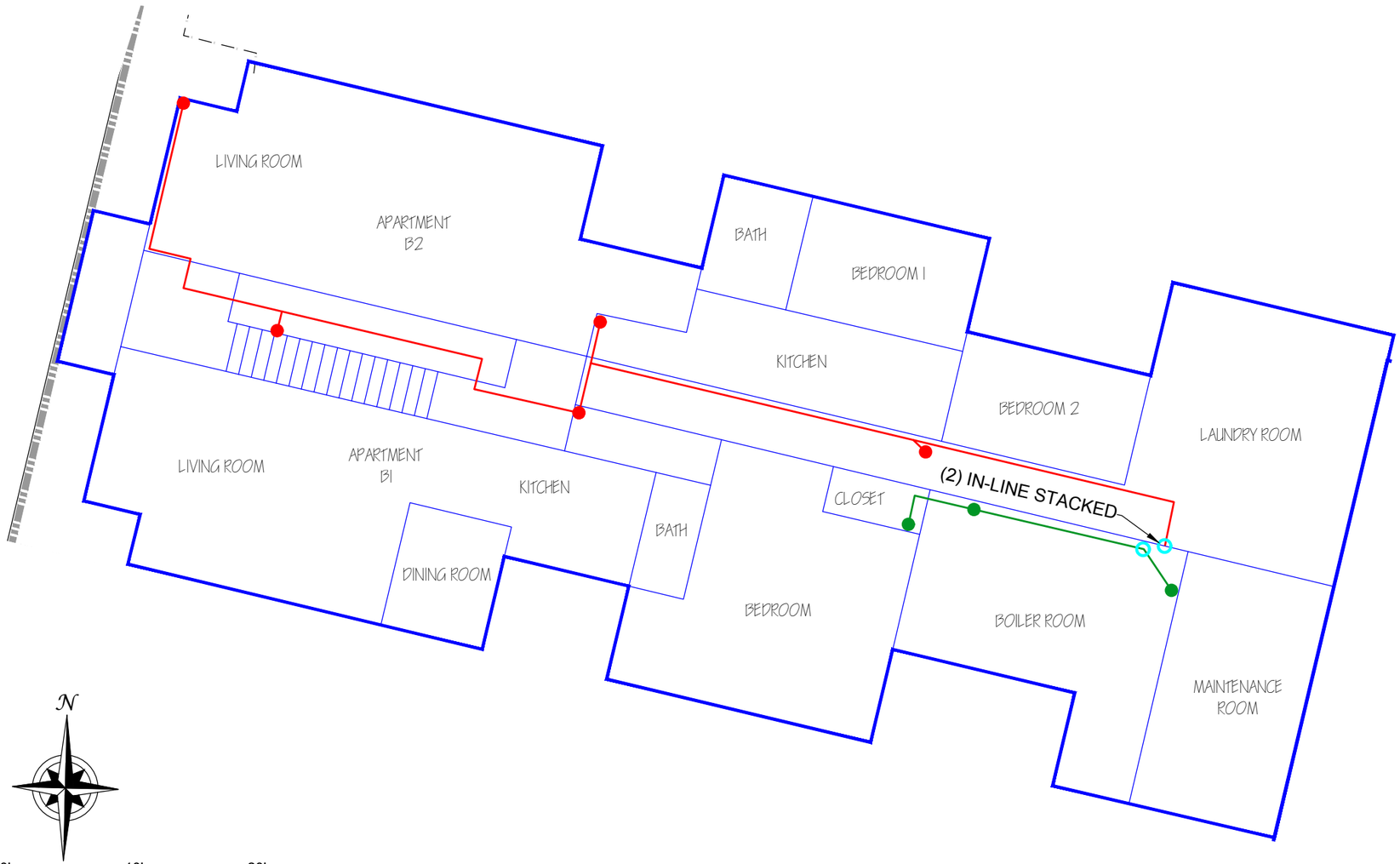
F:\CAD\BenchmarK\Buffalo Development Corp\275 Franklin Street\Site\Site Management Plan\2017\Figure 8; ASD System Layout.dwg

LEGEND:

- 267 FRANKLIN STREET APARTMENT BUILDING (432 PEARL STREET BCP SITE)
- ASD SYSTEM 1 (5 SUBSLAB SUCTION POINTS)
- ASD SYSTEM 2 (3 SUBSLAB SUCTION POINTS)
- RADONAWAY IN-LINE FAN (3)

NOTES:

1. THIS FIGURE WAS DERIVED FROM THE MALCOLM PIRNIE IMMEDIATE INVESTIGATION WORK ASSIGNMENT SUMMARY REPORT DATED DECEMBER 2009.



N

10' 0' 10' 20'

SCALE: 1 INCH = 10 FEET
SCALE IN FEET
(approximate)

DATE: JULY 2014
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JOB NO.: 0156-016-002

ASD SYSTEM LAYOUT
SITE MANAGEMENT PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES
BCP NO. C915208 & C915237
BUFFALO, NEW YORK
PREPARED FOR
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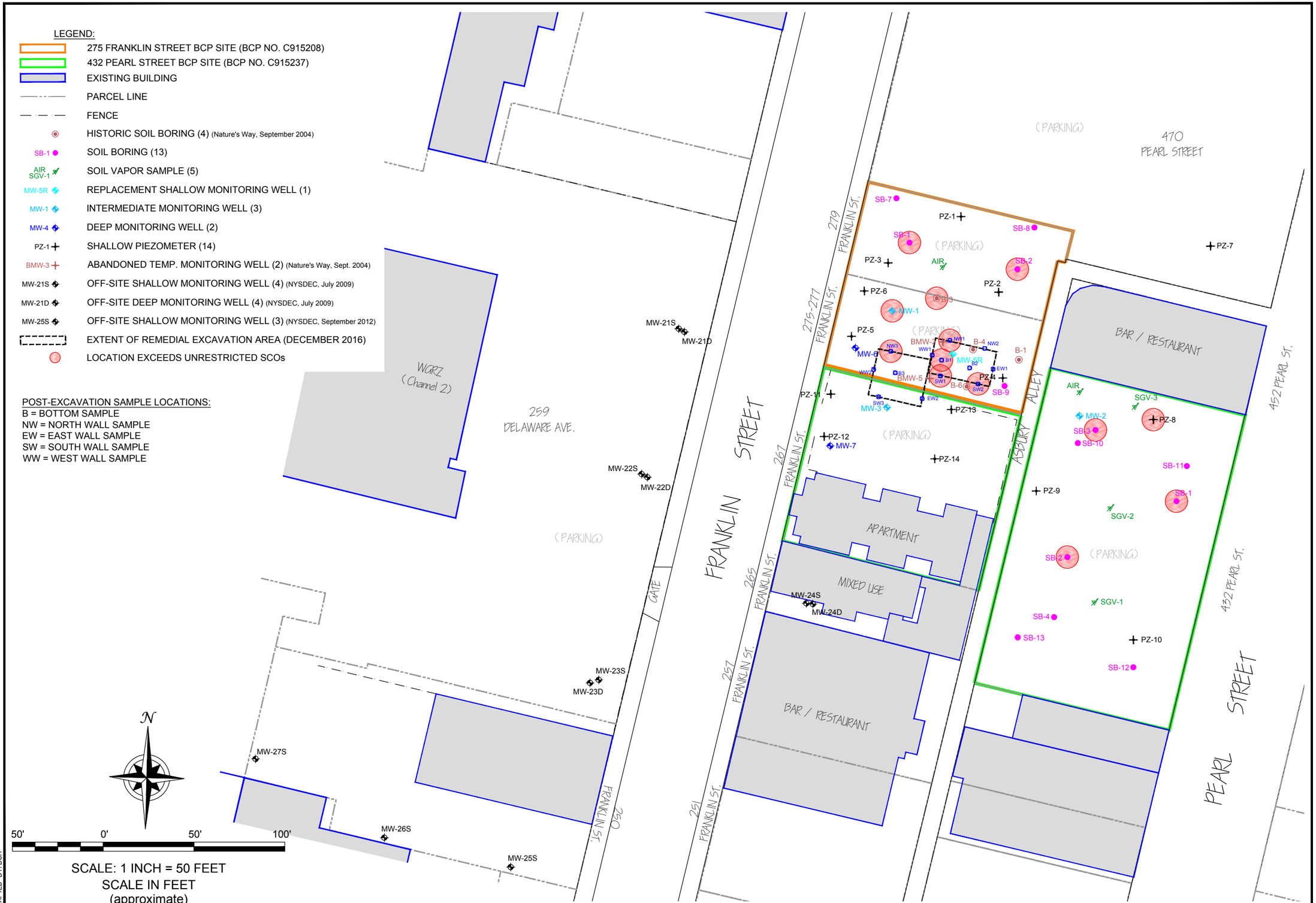
FIGURE 8

F:\CAD\BenchmarkBuffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 9; Remaining Soil Above Unrestricted SCOs.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- HISTORIC SOIL BORING (4) (Nature's Way, September 2004)
- SB-1 SOIL BORING (13)
- AIR SGV-1 SOIL VAPOR SAMPLE (5)
- MW-5R REPLACEMENT SHALLOW MONITORING WELL (1)
- MW-1 INTERMEDIATE MONITORING WELL (3)
- MW-4 DEEP MONITORING WELL (2)
- PZ-1 SHALLOW PIEZOMETER (14)
- BMW-3 ABANDONED TEMP. MONITORING WELL (2) (Nature's Way, Sept. 2004)
- MW-21S OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, July 2009)
- MW-21D OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, July 2009)
- MW-25S OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)
- EXTENT OF REMEDIAL EXCAVATION AREA (DECEMBER 2016)
- LOCATION EXCEEDS UNRESTRICTED SCOs

POST-EXCAVATION SAMPLE LOCATIONS:
B = BOTTOM SAMPLE
NW = NORTH WALL SAMPLE
EW = EAST WALL SAMPLE
SW = SOUTH WALL SAMPLE
WW = WEST WALL SAMPLE



N

50' 0' 50' 100'

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

DATE: MAY 2017
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REMAINING SOIL ABOVE UNRESTRICTED SCOs

SITE MANAGEMENT PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES
BCP NO. C915208 & C915237
BUFFALO, NEW YORK
PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

FIGURE 9

F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 10; Total cVOCs Isoconcentration MapR1.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- MW-1 — DEEP / INTERMEDIATE / OFF-SITE MONITORING WELL
- MW-21S — OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, July 2009)
- MW-21D — OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, July 2009)
- MW-23S — OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)
- MW-5 — SHALLOW MONITORING WELL
- PZ-4 — SHALLOW PIEZOMETER
- 14 — TOTAL cVOCs CONCENTRATION (ug/L)
- TOTAL cVOCs ISOCONCENTRATION CONTOURS (DASHED WHERE INFERRED)
- TOTAL cVOCs CONCENTRATION OF 1,000 - 10,000 ug/L
- TOTAL cVOCs CONCENTRATION OF 100 - 1,000 ug/L
- TOTAL cVOCs CONCENTRATION OF 5 - 100 ug/L

DATE: JULY 2017
DRAFTED BY: RFL

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SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: 0156-016-002

TOTAL cVOCs ISOCONCENTRATION MAP
POST-EXCAVATION SAMPLING EVENT (04/24/17)

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

FIGURE 10

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F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 11; PCE Isoconcentration MapR.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- MW-1 — DEEP / INTERMEDIATE / OFF-SITE MONITORING WELL
- MW-21S — OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, July 2009)
- MW-21D — OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, July 2009)
- MW-23S — OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)
- MW-5 — SHALLOW MONITORING WELL
- PZ-4 — SHALLOW PIEZOMETER
- 14 — TETRACHLOROETHENE (PCE) CONCENTRATION (ug/L)
- PCE ISOCONCENTRATION CONTOURS (DASHED WHERE INFERRED)
- PCE CONCENTRATION OF 1,000 - 10,000 ug/L
- PCE CONCENTRATION OF 100 - 1,000 ug/L
- PCE CONCENTRATION OF 5 - 100 ug/L

PCE GWQS = 5 ug/L

N

50' 0' 50' 100'

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

DATE: JULY 2017
DRAFTED BY: RFL

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JOB NO.: 0156-016-002

PCE ISOCONCENTRATION MAP
POST-EXCAVATION SAMPLING EVENT (04/24/17)

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

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BUFFALO DEVELOPMENT CORPORATION

FIGURE 11

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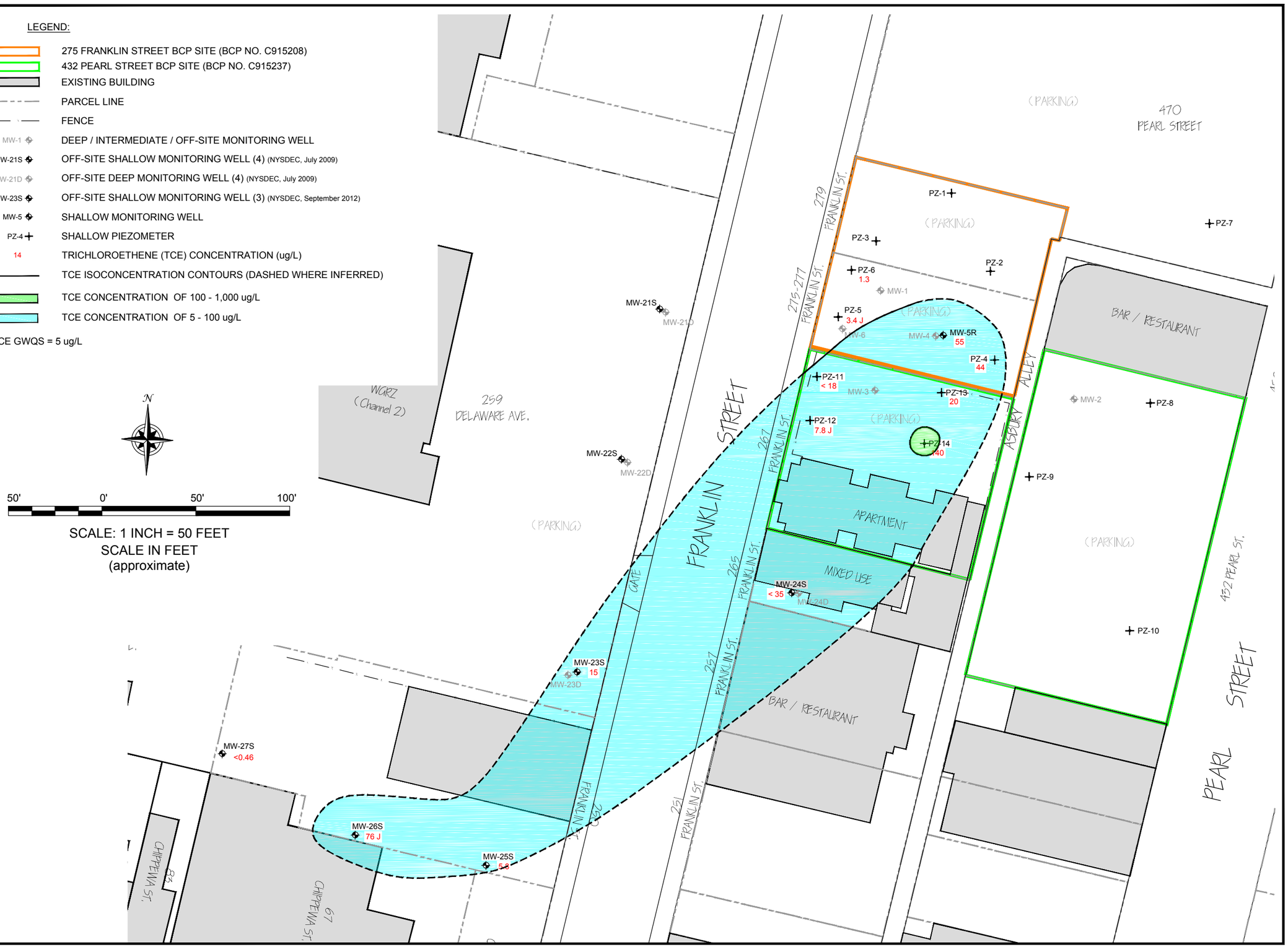
F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 12; TCE Isoconcentration MapR1.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- MW-1 — DEEP / INTERMEDIATE / OFF-SITE MONITORING WELL
- MW-21S — OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, July 2009)
- MW-21D — OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, July 2009)
- MW-23S — OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)
- MW-5 — SHALLOW MONITORING WELL
- PZ-4 — SHALLOW PIEZOMETER
- 14 — TRICHLOROETHENE (TCE) CONCENTRATION (ug/L)
- TCE ISOCONCENTRATION CONTOURS (DASHED WHERE INFERRED)
- TCE CONCENTRATION OF 100 - 1,000 ug/L
- TCE CONCENTRATION OF 5 - 100 ug/L

TCE GWQS = 5 ug/L



DATE: JULY 2017
DRAFTED BY: RFL

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BUFFALO, NY 14218
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JOB NO.: 0156-016-002

TCE ISOCONCENTRATION MAP
POST-EXCAVATION SAMPLING EVENT (04/24/17)

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

FIGURE 12

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F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 13; CIS 1,2-DCE Isoconcentration Map\R.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- PARCEL LINE
- FENCE
- MW-1 — DEEP / INTERMEDIATE / OFF-SITE MONITORING WELL
- MW-21S — OFF-SITE SHALLOW MONITORING WELL (4) (NYSDEC, July 2009)
- MW-21D — OFF-SITE DEEP MONITORING WELL (4) (NYSDEC, July 2009)
- MW-23S — OFF-SITE SHALLOW MONITORING WELL (3) (NYSDEC, September 2012)
- MW-5 — SHALLOW MONITORING WELL
- PZ-4 — SHALLOW PIEZOMETER
- 14 — cis-1,2-DICHLOROETHENE (cis-1,2-DCE) CONCENTRATION (ug/L)
- cis-1,2-DCE ISOCONCENTRATION CONTOURS (DASHED WHERE INFERRED)
- cis-1,2-DCE CONCENTRATION OF 100 - 1,000 ug/L
- cis-1,2-DCE CONCENTRATION OF 5 - 100 ug/L

cis-1,2-DCE GWQS = 5 ug/L

N

50' 0' 50' 100'

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

DATE: JULY 2017
DRAFTED BY: RFL

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JOB NO.: 0156-016-002

cis-1,2-DCE ISOCONCENTRATION MAP
POST-EXCAVATION SAMPLING EVENT (04/24/17)

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237
PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

FIGURE 13

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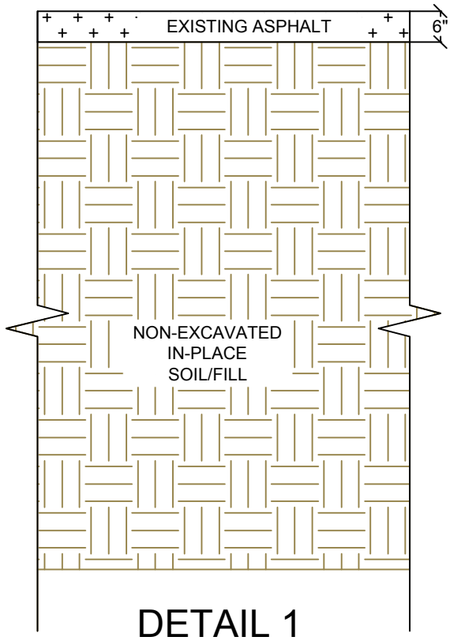
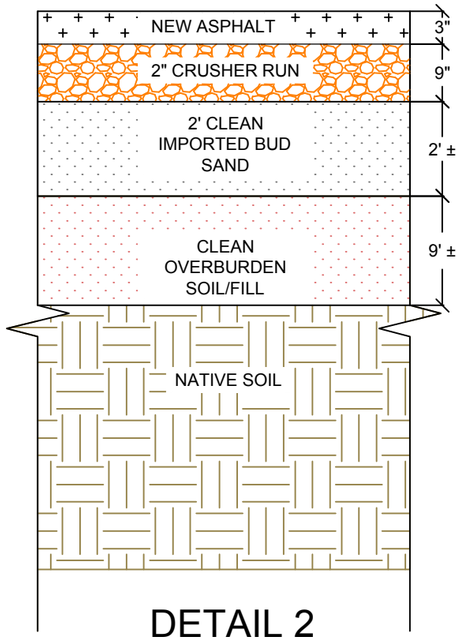
F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 14; Existing Cover Systems SMP.dwg

LEGEND:

- 275 FRANKLIN STREET BCP SITE (BCP NO. C915208)
- 432 PEARL STREET BCP SITE (BCP NO. C915237)
- EXISTING BUILDING
- SEE COVER SYSTEM DETAIL 1
- SEE COVER SYSTEM DETAIL 2 (REMEDIAL EXCAVATION AREA)
- PARCEL LINE



DETAIL 1



DETAIL 2

N

50' 0' 50' 100'

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

DATE: JULY 2017
DRAFTED BY: RFL

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JOB NO.: 0156-016-002

EXISTING COVER SYSTEMS

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

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FIGURE 14

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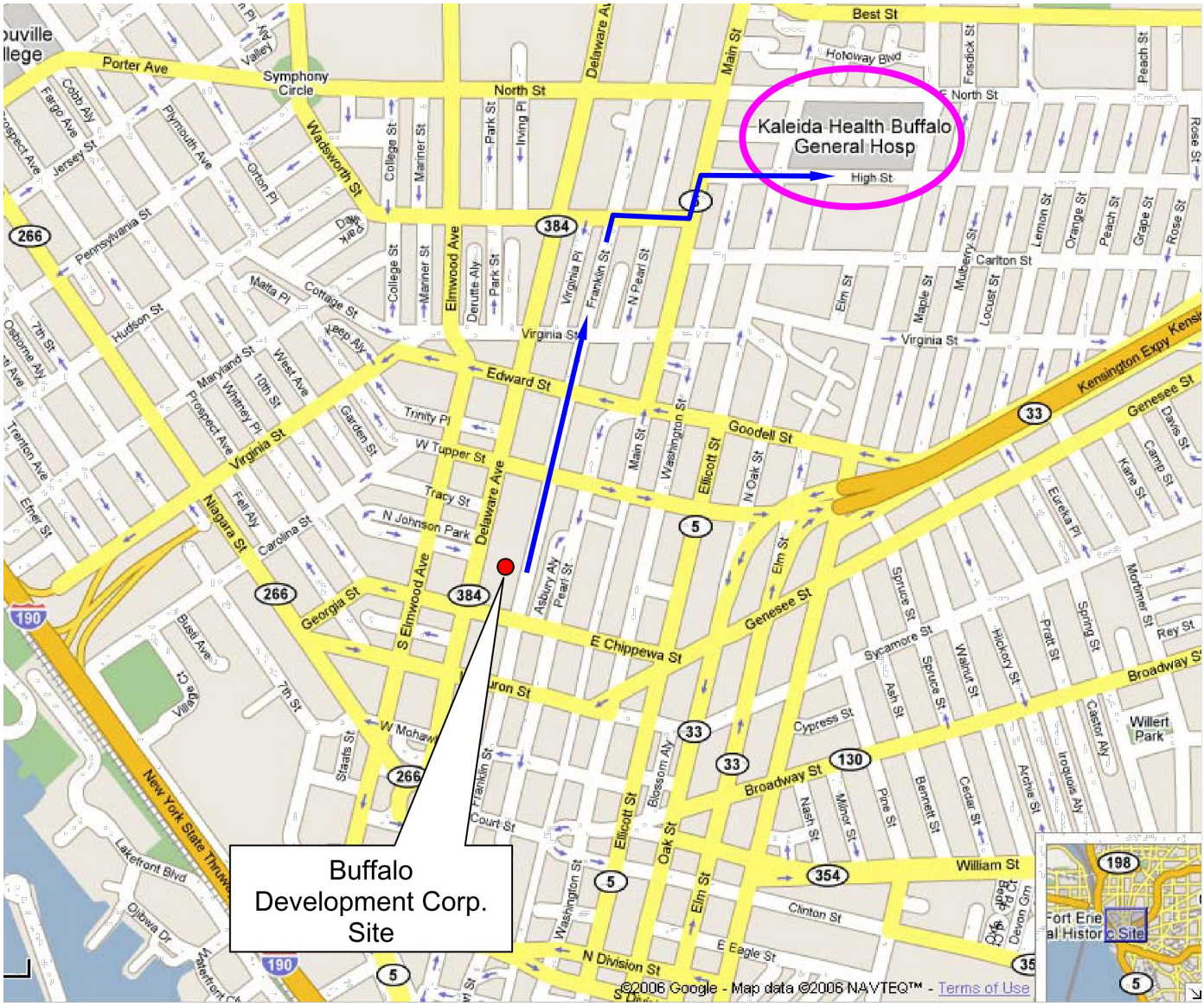
F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\2017\Figure 15; Hospital Route Map.dwg

FIGURE 15



Kaleida Health: Buffalo General Hospital
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Buffalo, New York 14203
(716) 859-5600

1. Leave site going north on Franklin Street.
2. Turn right on Wadsworth Street.
3. Turn left on Main Street.
4. Turn right on High Street, the hospital is on your left.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0599

PROJECT NO.: 0156-016-002
DATE: MAY 2017
DRAFTED BY: CMC

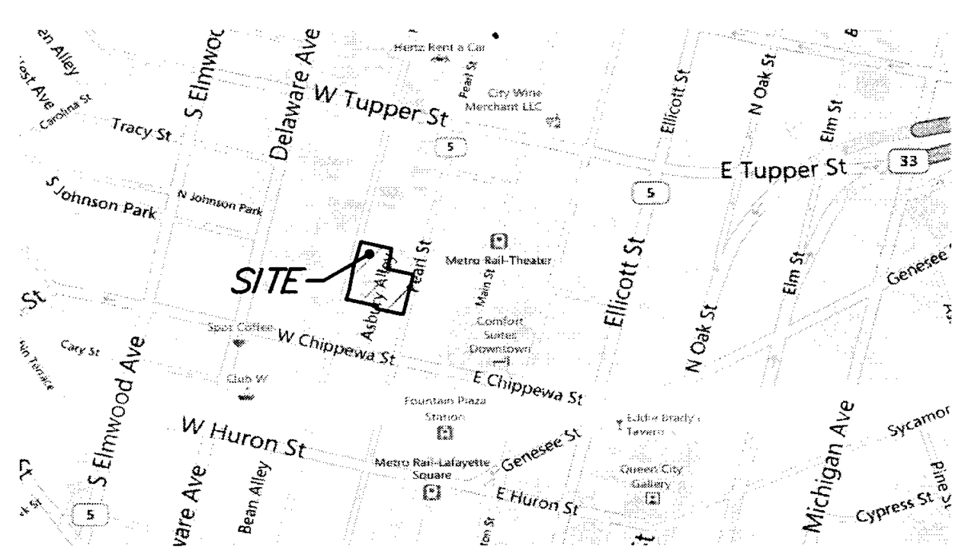
HOSPITAL ROUTE MAP

SITE MANAGEMENT PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BCP NO. C915208 & C915237
BUFFALO, NEW YORK
PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

APPENDIX A

METES & BOUNDS
ENVIRONMENTAL EASEMENT



VICINITY MAP

Not To Scale

- THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, N.Y. 12233 OR AT derweb@gw.dec.state.ny.us

THIS PROPERTY IS SUBJECT TO AN ENVIRONMENTAL EASEMENT HELD BY THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PERSUANT TO TITLE 36 OF ARTICLE 71 OF THE NEW YORK ENVIRONMENTAL CONSERVATION LAW.

Engineering and Institutional Controls
BCP Site No. C915208

A site cover currently exists (asphalt) and will be maintained to allow for continued commercial or restricted-residential use of the Site. Procedures for the inspection and maintenance of this permanent control are provided in the Site Management Plan (SMP).

The use of groundwater as a source of potable or process water is prohibited without necessary water quality treatment as determined by the NYSDOH or County DOH.

The Site was remediated for restricted-residential use (Track 4). The property may not be used for a higher level of use, such as residential, without additional remediation and amendment of the Environmental Easement as approved by the NYSDEC.

Remedial party or Site owner will complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with 6NYCRR Part 375-1.8 (h)(3).

Groundwater, soil vapor, and other environmental or public health monitoring must be performed as defined in the SMP and reported at the frequency and in the manner defined in the SMP.

All future Site buildings shall be equipped with an active SSD system.

All future activities on the Site that will disturb remaining contaminated material must be conducted in accordance with the SMP.

Engineering and Institutional Controls
BCP Site No. C915237

A site cover currently exists (asphalt) and will be maintained to allow for continued commercial or restricted-residential use of the Site. Procedures for the inspection and maintenance of this permanent control are provided in the SMP.

The vapor intrusion sub-slab depressurization (SSD) system within the existing 267 Franklin St. building shall be maintained and monitored in accordance with the SMP.

The Site was remediated for restricted-residential use (Track 4). The property may not be used for a higher level of use, such as residential, without additional remediation and amendment of the Environmental Easement as approved by the NYSDEC.

Remedial party or site owner will complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with 6NYCRR Part 375-1.8(h)(3).

Groundwater, soil vapor, and other environmental or public health monitoring must be performed as defined in the SMP and reported at the frequency and in the manner defined in the SMP.

The use of groundwater as a source of potable or process water is prohibited without additional remediation and amendment of the Environmental Easement as approved by NYSDEC.

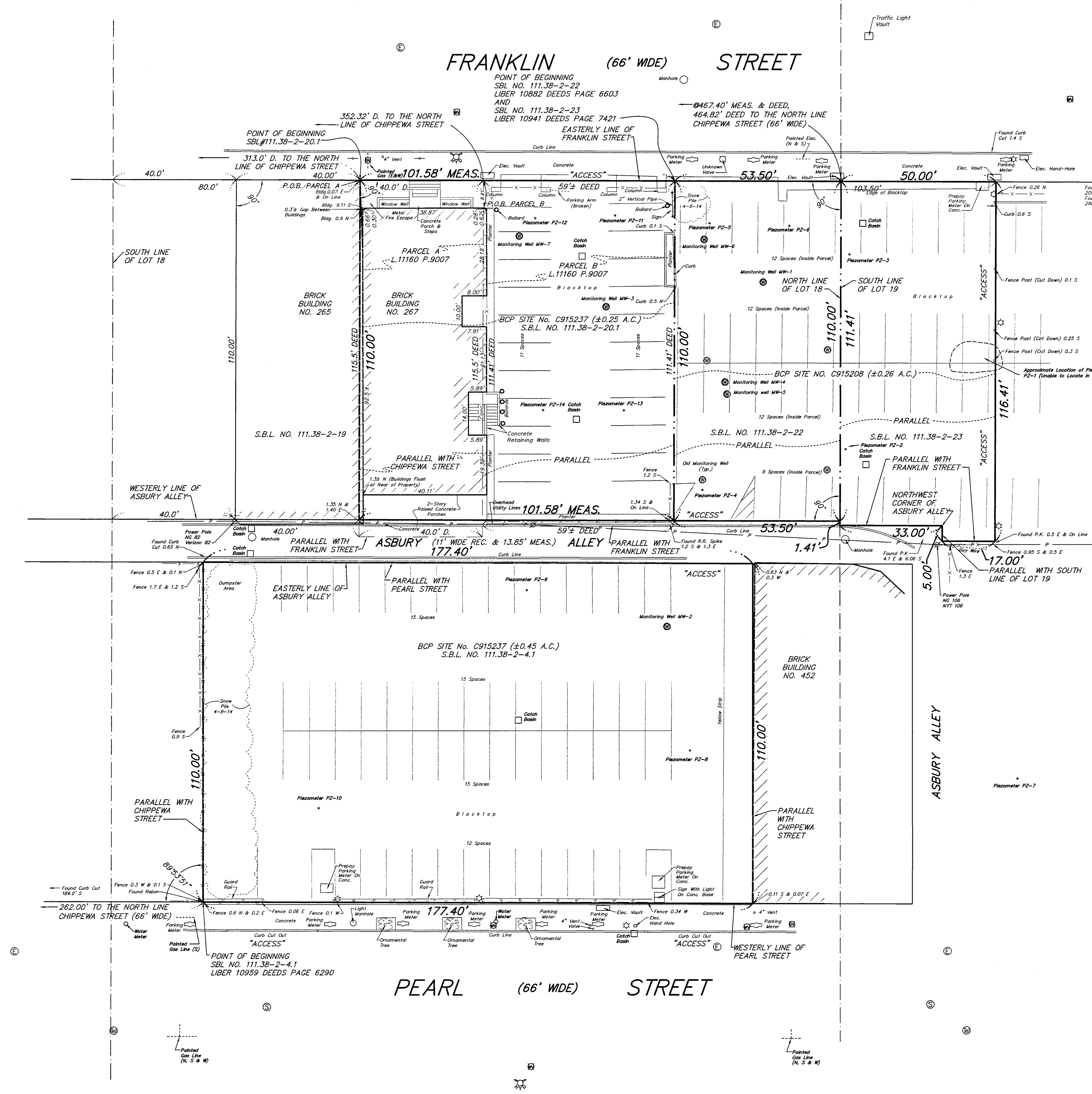
All future Site buildings shall be equipped with an active SSD system.

All future Activities on the Site that will disturb remaining contaminated material must be conducted in accordance with the SMP.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.



RECORDED LEGAL DESCRIPTIONS:

432 PEARL STREET
SBL NO. 111.38-2-4.1
LIBER 11264 DEEDS PAGE 4898
RECORDED MAY 28, 2014

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie, State of New York, being part of Outer Lot number 18 and being more particularly described as follows:

BEGINNING at a point in the westerly line of Pearl Street distance 262.00 feet northerly of the north line of Chippewa Street; thence westerly and parallel to Chippewa Street 110.00 feet to the easterly line of Asbury Alley; thence northerly, along the easterly line of Asbury Alley and parallel to Pearl Street 177.40 feet to a point; thence easterly, parallel to Chippewa Street 110.00 feet to the westerly line of Pearl Street; thence southerly and along the westerly line of Pearl Street 177.40 feet to the point or place of beginning.
(Parcel containing 19,514 square feet of land, more of less.)

267 FRANKLIN STREET
SBL NO. 111.38-2-20.1
LIBER 11264 DEEDS P.4198
RECORDED MAY 27, 2014

PARCEL A
ALL THAT CERTAIN PIECE OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of Outer Lot Number 18, bounded and described as follows:

BEGINNING on the easterly line of Franklin Street. 313 feet northerly from the northerly line of Chippewa Street; running thence easterly and parallel with Cipppewa Street, 115 1/2 (115.50) feet; thence northerly parallel with Franklin Street, 40 feet; thence westerly parallel with Chippewa Street, 115 1/2 (115.50) feet, thence southerly on the easterly line of Franklin Street 40 feet to the place of beginning.

PARCEL B
ALL THAT CERTAIN PIECE OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of Outer Lot Number 18, bounded and described as follows:

BEGINNING at a point in the easterly line of Franklin Street, being 66 feet wide, distant 352.32 feet northerly from the intersection of said easterly line of Franklin Street with the northerly line of Chippewa Street (being 66 feet wide); thence northerly along the easterly line of Franklin Street, a record distance of 59 feet, more or less to a point, said point being a record distance of 53.50 feet southerly of the intersection of the north line of Outer Lot Number 18 and the easterly line of Franklin Street; thence easterly and parallel with said northerly line of Outer Lot Number 18 a measured distance of 111.41 feet; thence southerly and parallel with the easterly line of Franklin Street, a record distance of 59 feet, more or less, to a point in a line drawn easterly from the point of beginning and parallel with said northerly line of Outer Lot Number 18; thence westerly along said line and parallel with said northerly line of Lot Number 18, a measured distance of 111.41 feet to the easterly line of Franklin Street at the point or place of beginning.

275 FRANKLIN STREET
SBL NO. 111.38-2-22
LIBER 11261 DEEDS PAGE 6180
RECORDED MARCH 14, 2014

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie and State of New York being part of Outer Lot No. 18 described as follows:

Beginning on the east line of Franklin Street at its intersection with the north line of said Outer Lot No. 18 and about four hundred sixty-seven and forty hundredths (467.40) feet north from Chippewa Street; thence easterly on said north line of said Outer Lot No. 18, one hundred ten (110) feet to an alley; thence south at right angles fifty-three and one-half (53 1/2) feet; thence westerly and parallel with the said north line of said Outer Lot No. 18, one hundred ten (110) feet to the east line of Franklin Street; thence along said line of Franklin Street northerly fifty-three and one-half (53 1/2) feet to the place of beginning.
(Parcel containing 5,885 square feet of land, more or less.)

279 FRANKLIN STREET
SBL NO. 111.38-2-23
LIBER 11261 DEEDS PAGE 6163
RECORDED MARCH 14, 2014

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie, State of New York, being part of Outer Lot 19, in said City, bounded and described as follows:

Beginning at the point of intersection of the easterly line of Franklin Street (66 feet wide) and the southerly line of Outer Lot No. 19, said point being 464.82 feet north of the northerly line of Chippewa Street (66 feet wide) as measured along the easterly line of Franklin Street: thence easterly at right angles and along the southerly line of Outer Lot No. 19, a distance of 111.41 feet to a point on the westerly line of Asbury Alley (11 feet wide); thence northerly on a line drawn parallel with Franklin Street and along the westerly line of Asbury Alley a distance of 33.00 feet to the northwest corner of Asbury Alley; thence easterly on a line drawn parallel with the southerly line of Outer Lot No. 19 and along the northerly line of Asbury Alley a distance of 5.00 feet to a point; thence northerly on a line drawn parallel with Franklin Street a distance of 17.00 feet to a point; thence westerly on a line drawn parallel with the southerly line of Outer Lot No. 19, a distance of 116.41 feet to a point on the easterly line of Franklin Street; thence southerly along the easterly line of Franklin Street, a distance of 50.00 feet to the point or place of beginning.
(Parcel containing 5,655 square feet of land, more of less.)

ENVIRONMENTAL EASEMENT LEGAL DESCRIPTION:

BCP Site No. C915237

SBL Nos. 111.38-2-20.1 & 111.38-2-4.1

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie and State of New York, being part of Outer Lot 18, bounded and described as follows:

BEGINNING at a point in the easterly line of Franklin Street (66 feet wide), distant 80.00 feet northerly from the southerly line of Outer Lot 18, said point having a record distance of 313 feet northerly from the northerly line of Chippewa Street;

THENCE easterly along a line at right angles to said line of Franklin Street, a distance of 110 feet to the westerly line of Asbury Alley (11 feet wide record, 13.85 feet wide measured);

THENCE northerly along the westerly line of Asbury Alley, a distance of 101.58 feet a point, said point being distant 53.50 feet southerly from the south line of Outer Lot 19;

THENCE westerly along a line drawn parallel with the south line of Outer Lot 19, a distance of 110 feet to a point on the easterly line of Franklin Street;

THENCE southerly along the easterly line of Franklin Street, a distance of 101.58 feet to the point of beginning.

Said parcel containing 0.25 acres, more or less.

ALSO ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie, State of New York, being part of Outer Lot number 18 and being more particularly described as follows:

BEGINNING at a point in the westerly line of Pearl Street distant 262.00 feet northerly of the north line of Chippewa Street;

THENCE westerly and parallel to Chippewa Street 110.00 feet to the easterly line of Asbury Alley;

THENCE northerly, along the easterly line of Asbury Alley and parallel to Pearl Street 177.40 feet to a point;

THENCE easterly, parallel to Chippewa Street 110.00 feet to the westerly line of Pearl Street;

THENCE southerly and along the westerly line of Pearl Street 177.40 feet to the point of place of beginning.

Said parcel containing an area of 0.45 acres, more or less.

BCP Site No. C915208

SBL Nos. 111.38-2-22 & 111.38-2-23

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie and State of New York being part of Outer Lot Nos. 18 and 19 described as follows:

BEGINNING on the east line of Franklin Street distant 53.50 southerly from its intersection with the north line of said Outer Lot No. 18;

THENCE easterly along a line drawn parallel with said north line of said Outer Lot No. 18, a distance of 110 feet to the westerly line of Asbury Alley;

THENCE northerly along the westerly line of Asbury Alley, a distance of 53.50 feet to the south line of Outer Lot 19;

THENCE easterly along the southerly line of Outer Lot 19, a distance of 1.41 feet to a point on the westerly line of Asbury Alley;

THENCE northerly along a line drawn parallel with Franklin Street and along the westerly line of Asbury Alley, a distance of 33.00 feet to the northwest corner of Asbury Alley;

THENCE easterly on a line drawn parallel with the southerly line of Outer Lot 19 and along the northerly line of Asbury Alley, a distance of 5.00 feet to a point;

THENCE northerly along a line drawn parallel with Franklin Street, a distance of 17.00 feet to a point;

THENCE westerly on a line drawn parallel with the southerly line of Outer Lot 19, a distance of 116.41 feet to a point on the easterly line of Franklin Street;

THENCE southerly along the easterly line of Franklin Street, a distance of 103.50 feet to the point of beginning.

Said parcel containing an area of 0.26 acres, more or less.

ZONING:

DO – DOWNTOWN OPPORTUNITY DISTRICT

Height regulations. The Minimum height from curb level for building shall be two stories or 24 feet, whichever is greater.

Stepbacks. Building stepbacks shall first be allowed at the minimum building height of 24 feet and shall be required at the building height of 50 feet. This stepback shall be at least 10 feet on lots less than 110 feet deep. On lots greater than 110 feet deep, stepback at least 15 feet deep is required.

Front yards. No front yards are permitted. Building shall be built to the front lot lines for at least two stories or 24 feet of building height, whichever is greater. For the purposes of this subsection, a building will be deemed to comply with these regulations if a maximum of 25% of the area of the building wall is recessed to a maximum of three feet.

Side yards. No side yards shall be permitted in the DO District.

FLOOD HAZARD DATA

INFORMATION PER FLOOD INSURANCE RATE ISSUED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY – NATIONAL FLOOD INSURANCE PROGRAM.
COMMUNITY: CITY OF BUFFALO
ZONE X, AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOOD-PLANE
FLOOD ZONE PANEL 360230 0020 D

CERTIFICATION

To: The People of the State of New York acting through their Commissioner of the Department of Environmental Conservation

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2011 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys, jointly established and adopted by ALTA and NSPS. The field work was completed on 5-5-14.

Date of Plat or Map: 5-13-14.

Francis C. Delles Registration No. 050477
PRELIMINARY – SURVEYOR HAS NOT RECEIVED TITLE INFORMATION

5/21/14: AMEND PER COMMENTS
5/27/14: AMEND PER COMMENTS
5/29/14: UPDATED RECORDED LEGAL DESCRIPTIONS
5/29/14: UPDATED RECORDED LEGAL DESCRIPTIONS

LEGEND

Ø	UTILITY / SERVICE POLE	R.O.W.	RIGHT OF WAY
WV	WATER LINE VALVE	CONC.	CONCRETE
	FIRE HYDRANT	INV.	INVERT
	D.I. (DROP INLET – STORM)	M.H.	MANHOLE
Ⓓ	MANHOLE (STORM)	—G—	GAS LINE
Ⓔ	MANHOLE (ELECTRIC)	—W—	WATER LINE
Ⓣ	MANHOLE (TRAFFIC)	—T—	TELEPHONE LINE
Ⓢ	MANHOLE (SANITARY)	—E—	ELECTRIC LINE
∘	LDR (LIGHT DUTY RECEIVER – STORM)	—P—	UTILITY LINES
∘	BYD (BACKYARD DRAIN INLET – STORM)	—C—	CABLE LINES
GV	GAS LINE VALVE	D.	DEED
	LIGHT STANDARD	M.	MEASURED
—o—	SIGN	L.	LIBER
H.C.	HANDICAP	P.	PAGE

INSTRUMENT(S) UTILIZED IN DETERMINING LOCATION OF BOUNDARY LINES:
THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT ABSTRACT OF TITLE AND IS SUBJECT TO ANY STATE OF FACTS THAT MAY BE REVEALED IN SAID ABSTRACT.
NOTE: PROPERTY CORNER MONUMENTS WERE NOT PLACED AS PART OF THIS SURVEY.

©COPYRIGHT 2014 BY:
Millard, MacKay & Delles
LAND SURVEYORS, LLP
150 AERO DRIVE
BUFFALO, NEW YORK 14225
PHONE (716) 631-5140 ~ FAX 631-3811

AMEND: "D"
SURVEY DATE: 5-5-14
©DRAWING DATE: 5-13-14
SCALE: 1" = 20'
"ALL RIGHTS RESERVED"

ALTA/ACSM LAND TITLE SURVEY

PART OF LOT 18&19 SECTION ____ TOWNSHIP ____ RANGE ____ OF THE: Outer Lot SURVEY – Erie COUNTY, N.Y.

THIS MAP VOID UNLESS EMBOSSED WITH NEW YORK STATE LICENSED LAND SURVEYOR'S SEAL. ALTERING ANY ITEM ON THIS MAP IS A VIOLATION OF THE LAW EXCEPT AS PROVIDED IN SECTION 7209, PART 2, OF THE NEW YORK STATE EDUCATION LAW.

SURVEY OF: 267. 275-277, 270 Franklin St. 432 Pearl Street, City of Buffalo

SBL No. 111.38-2-20.1, 22, 23 & 4.1

Liber 11271 of Deeds pg 1847 D11271-1847 Box 116

FILED
OCT 27 2014
ERIE COUNTY CLERK'S OFFICE

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 8th day of October, 2014, between Owner(s) Buffalo Development Corporation, having an office at 257 Franklin Street, City of Buffalo, County of Erie, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 275-277 Franklin Street and 279 Franklin Street in the City of Buffalo, County of Erie and State of New York, known and designated on the tax map of the County Clerk of Erie as tax map parcel numbers: Section 111.38 Block 2 Lot 22 and 23, being the same as that property conveyed to Grantor by deed dated May 10, 2014 and recorded in the Erie County Clerk's Office in Liber and Page 11261/6180 and 11261/6163. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately .26 +/- acres, and is hereinafter more fully described in the Land Title Survey dated May 5, 2014 prepared by Millard, MacKay & Delles Land Surveyors, LLP, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is

extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C915208, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Erie County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining

contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation

Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5 the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by

Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C915208
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Buffalo Development Corporation:

By: Mark D. Croce

Print Name: MARK D. CROCE

Title: PRESIDENT Date: 10/2/14

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 2nd day of October, in the year 2014, before me, the undersigned, personally appeared Mark D Croce, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Deanne Stachowski
Notary Public - State of New York

DEANNE STACHOWSKI
Notary Public, State of New York
Qualified In Erie County
My Commission Expires Sept. 7, 2016

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 8th day of October, in the year 2014 before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2016

SCHEDULE "A" PROPERTY DESCRIPTION

Property Description 275-277 Franklin

All that Tract or Parcel of Land, situate in the City of Buffalo, County of Erie and State of New York being part of Outer Lot No. 18 described as follows:

Beginning on the east line of Franklin Street at its intersection with the north line of said Outer Lot No.18 and about four hundred sixty-seven and forty hundredths (467.40) feet north from Chippewa Street; thence easterly on said north line of said Outer Lot No. 18, one hundred ten (110) feet to an alley; thence south at right angles fifty-three and one half (53 1/2) feet; thence westerly and parallel with the said north line of said Outer Lot No.18, one hundred ten (110) feet to the east line of Franklin Street; thence along said line of Franklin Street northerly fifty- three and one half (53 1/2) feet to the place of beginning.

Property Description 279 Franklin

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Buffalo, County of Erie, State of New York, being part of Outer Lot 19, in said City, bounded and described as follows:

Beginning at the point of intersection of the easterly line of Franklin Street (66 feet wide) and the southerly line of Outer Lot No. 19, said point being 464.82 feet north of the northerly line of Chippewa Street (66 feet wide) as measured along the easterly line of Franklin Street; thence easterly at right angles and along the southerly line of Outer Lot No. 19, a distance of 111.41 feet to a point on the westerly line of Asbury Alley (11 feet wide); thence northerly on a line drawn parallel with Franklin Street and along the westerly line of Asbury Alley a distance of 33.00 feet to the northwest corner of Asbury Alley; thence easterly on a line drawn parallel with the southerly line of Outer Lot No. 19 and along the northerly line of Asbury Alley a distance of 5.00 feet to a point; thence northerly on a line drawn parallel with Franklin Street a distance of 17.00 feet to a point; thence westerly on a line drawn parallel with the southerly line of Outer Lot No. 19, a distance of 116.41 feet to a point on the easterly line of Franklin Street; thence southerly along the easterly line of Franklin Street, a distance of 50.00 feet to the point or place of beginning.

TP-584 (4/13)

New York State Department of Taxation and Finance

Combined Real Estate Transfer Tax Return, Credit Line Mortgage Certificate, and Certification of Exemption from the Payment of Estimated Personal Income Tax

Recording office time stamp

See Form TP-584-I, Instructions for Form TP-584, *before completing this form. Print or type.*

Schedule A — Information relating to conveyance

Grantor/Transferor	Name *(if individual, last, first, middle initial)* ☐ *check if more than one grantor*			Social security number
☐ Individual ☒ Corporation ☐ Partnership ☐ Estate/Trust ☐ Single member LLC ☐ Other	Buffalo Development Corporation			
	Mailing address 257 Franklin Street			Social security number
	City Buffalo	State NY	ZIP code 14202	Federal EIN 16-1535033
	Single member's name if grantor is a single member LLC *(see instructions)*			Single member EIN or SSN

Grantee/Transferee	Name *(if individual, last, first, middle initial)* ☐ *check if more than one grantee*			Social security number
☐ Individual ☐ Corporation ☐ Partnership ☐ Estate/Trust ☐ Single member LLC ☒ Other	The People of the State of NY, acting through their Commissioner of the NYSDEC			
	Mailing address 625 Broadway			Social security number
	City Albany	State NY	ZIP code 12233	Federal EIN 14-6013200
	Single member's name if grantee is a single member LLC *(see instructions)*			Single member EIN or SSN

Location and description of property conveyed

Tax map designation – Section, block & lot *(include dots and dashes)*	SWIS code (six digits)	Street address	City, town, or village	County
111.38-2-22 111.38-2-23	140200	277 Franklin Street 279 Franklin Street	Buffalo	Erie

Type of property conveyed *(check applicable box)*

1 ☐ One- to three-family house
2 ☐ Residential cooperative
3 ☐ Residential condominium
4 ☐ Vacant land
5 ☒ Commercial/Industrial
6 ☐ Apartment building
7 ☐ Office building
8 ☐ Other _____

Date of conveyance: 10 (month) 08 (day) 2014 (year)

Percentage of real property conveyed which is residential real property 0 % *(see instructions)*

Condition of conveyance *(check all that apply)*

a. ☐ Conveyance of fee interest
b. ☐ Acquisition of a controlling interest (state percentage acquired _____ %)
c. ☐ Transfer of a controlling interest (state percentage transferred _____ %)
d. ☐ Conveyance to cooperative housing corporation
e. ☐ Conveyance pursuant to or in lieu of foreclosure or enforcement of security interest *(attach Form TP-584.1, Schedule E)*
f. ☐ Conveyance which consists of a mere change of identity or form of ownership or organization *(attach Form TP-584.1, Schedule F)*
g. ☐ Conveyance for which credit for tax previously paid will be claimed *(attach Form TP-584.1, Schedule G)*
h. ☐ Conveyance of cooperative apartment(s)
i. ☐ Syndication
j. ☐ Conveyance of air rights or development rights
k. ☐ Contract assignment
l. ☐ Option assignment or surrender
m. ☐ Leasehold assignment or surrender
n. ☐ Leasehold grant
o. ☐ Conveyance of an easement
p. ☒ Conveyance for which exemption from transfer tax claimed *(complete Schedule B, Part III)*
q. ☐ Conveyance of property partly within and partly outside the state
r. ☐ Conveyance pursuant to divorce or separation
s. ☒ Other *(describe)* Environmental Easement

For recording officer's use	Amount received Schedule B., Part I $ _____ Schedule B., Part II $	Date received	Transaction number

Schedule B — Real estate transfer tax return (Tax Law, Article 31)

Part I – Computation of tax due

1	Enter amount of consideration for the conveyance *(if you are claiming a total exemption from tax, check the exemption claimed box, enter consideration and proceed to Part III)* ☒ **Exemption claimed**	1.	
2	Continuing lien deduction *(see instructions if property is taken subject to mortgage or lien)*	2.	
3	Taxable consideration *(subtract line 2 from line 1)*	3.	
4	Tax: $2 for each $500, or fractional part thereof, of consideration on line 3	4.	
5	Amount of credit claimed for tax previously paid *(see instructions and attach Form TP-584.1,* Schedule G*)*	5.	
6	Total tax due* *(subtract line 5 from line 4)*	6.	

Part II – Computation of additional tax due on the conveyance of residential real property for $1 million or more

1	Enter amount of consideration for conveyance *(from* Part I*, line 1)*	1.	
2	Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in* Schedule A*)*	2.	
3	Total additional transfer tax due* *(multiply line 2 by 1% (.01))*	3.	

Part III – Explanation of exemption claimed on Part I, line 1 *(check any boxes that apply)*

The conveyance of real property is exempt from the real estate transfer tax for the following reason:

a. Conveyance is to the United Nations, the United States of America, the state of New York, or any of their instrumentalities, agencies, or political subdivisions (or any public corporation, including a public corporation created pursuant to agreement or compact with another state or Canada) ..... a ☒

b. Conveyance is to secure a debt or other obligation ..... b ☐

c. Conveyance is without additional consideration to confirm, correct, modify, or supplement a prior conveyance ..... c ☐

d. Conveyance of real property is without consideration and not in connection with a sale, including conveyances conveying realty as bona fide gifts ..... d ☐

e. Conveyance is given in connection with a tax sale ..... e ☐

f. Conveyance is a mere change of identity or form of ownership or organization where there is no change in beneficial ownership. (This exemption cannot be claimed for a conveyance to a cooperative housing corporation of real property comprising the cooperative dwelling or dwellings.) Attach Form TP-584.1, Schedule F ..... f ☐

g. Conveyance consists of deed of partition ..... g ☐

h. Conveyance is given pursuant to the federal Bankruptcy Act ..... h ☐

i. Conveyance consists of the execution of a contract to sell real property, without the use or occupancy of such property, or the granting of an option to purchase real property, without the use or occupancy of such property ..... i ☐

j. Conveyance of an option or contract to purchase real property with the use or occupancy of such property where the consideration is less than $200,000 and such property was used solely by the grantor as the grantor's personal residence and consists of a one-, two-, or three-family house, an individual residential condominium unit, or the sale of stock in a cooperative housing corporation in connection with the grant or transfer of a proprietary leasehold covering an individual residential cooperative apartment ..... j ☐

k. Conveyance is not a conveyance within the meaning of Tax Law, Article 31, section 1401(e) *(attach documents supporting such claim)* ..... k ☐

*The total tax (from Part I, line 6 and Part II, line 3 above) is due within 15 days from the date conveyance. Please make check(s) payable to the county clerk where the recording is to take place. If the recording is to take place in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, make check(s) payable to the ***NYC Department of Finance.*** If a recording is not required, send this return and your check(s) made payable to the ***NYS Department of Taxation and Finance,*** directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-5045.

Schedule C — Credit Line Mortgage Certificate (Tax Law, Article 11)

Complete the following only if the interest being transferred is a fee simple interest.
I (we) certify that: *(check the appropriate box)*

1. ☒ The real property being sold or transferred is not subject to an outstanding credit line mortgage.

2. ☐ The real property being sold or transferred is subject to an outstanding credit line mortgage. However, an exemption from the tax is claimed for the following reason:
   - ☐ The transfer of real property is a transfer of a fee simple interest to a person or persons who held a fee simple interest in the real property (whether as a joint tenant, a tenant in common or otherwise) immediately before the transfer.
   - ☐ The transfer of real property is (A) to a person or persons related by blood, marriage or adoption to the original obligor or to one or more of the original obligors or (B) to a person or entity where 50% or more of the beneficial interest in such real property after the transfer is held by the transferor or such related person or persons (as in the case of a transfer to a trustee for the benefit of a minor or the transfer to a trust for the benefit of the transferor).
   - ☐ The transfer of real property is a transfer to a trustee in bankruptcy, a receiver, assignee, or other officer of a court.
   - ☐ The maximum principal amount secured by the credit line mortgage is $3,000,000 or more, and the real property being sold or transferred is **not** principally improved nor will it be improved by a one- to six-family owner-occupied residence or dwelling.

     Please note: for purposes of determining whether the maximum principal amount secured is $3,000,000 or more as described above, the amounts secured by two or more credit line mortgages may be aggregated under certain circumstances. See TSB-M-96(6)-R for more information regarding these aggregation requirements.
   - ☐ Other *(attach detailed explanation)*.

3. ☐ The real property being transferred is presently subject to an outstanding credit line mortgage. However, no tax is due for the following reason:
   - ☐ A certificate of discharge of the credit line mortgage is being offered at the time of recording the deed.
   - ☐ A check has been drawn payable for transmission to the credit line mortgagee or his agent for the balance due, and a satisfaction of such mortgage will be recorded as soon as it is available.

4. ☐ The real property being transferred is subject to an outstanding credit line mortgage recorded in _____ (Insert liber and page or reel or other identification of the mortgage). The maximum principal amount of debt or obligation secured by the mortgage is _____. No exemption from tax is claimed and the tax of _____ is being paid herewith. *(Make check payable to county clerk where deed will be recorded or, if the recording is to take place in New York City but not in Richmond County, make check payable to the **NYC Department of Finance.**)*

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

Grantor signature	Title	Grantee signature	Title
Mark D. Groce	PRESIDENT	NYSDEC	Assoc. Atty NYSDEC
Grantor signature	Title	Grantee signature	Title

Reminder: Did you complete all of the required information in Schedules A, B, and C? Are you required to complete Schedule D? If you checked *e*, *f*, or *g* in Schedule A, did you complete Form TP-584.1? Have you attached your check(s) made payable to the county clerk where recording will take place or, if the recording is in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, to the ***NYC Department of Finance***? If no recording is required, send your check(s), made payable to the ***Department of Taxation and Finance,*** directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-5045.

Schedule D - Certification of exemption from the payment of estimated personal income tax (Tax Law, Article 22, section 663)

Complete the following only if a fee simple interest or a cooperative unit is being transferred by an individual or estate or trust.

If the property is being conveyed by a referee pursuant to a foreclosure proceeding, proceed to Part II, and check the second box under *Exemptions for nonresident transferor(s)/seller(s)* and sign at bottom.

Part I - New York State residents

If you are a New York State resident transferor(s)/seller(s) listed in Schedule A of Form TP-584 (or an attachment to Form TP-584), you must sign the certification below. If one or more transferors/sellers of the real property or cooperative unit is a resident of New York State, **each** resident transferor/seller must sign in the space provided. If more space is needed, please photocopy this Schedule D and submit as many schedules as necessary to accommodate all resident transferors/sellers.

Certification of resident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) as signed below was a resident of New York State, and therefore is not required to pay estimated personal income tax under Tax Law, section 663(a) upon the sale or transfer of this real property or cooperative unit.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Note: A resident of New York State may still be required to pay estimated tax under Tax Law, section 685(c), but not as a condition of recording a deed.

Part II - Nonresidents of New York State

If you are a nonresident of New York State listed as a transferor/seller in Schedule A of Form TP-584 (or an attachment to Form TP-584) but are not required to pay estimated personal income tax because one of the exemptions below applies under Tax Law, section 663(c), check the box of the appropriate exemption below. If any one of the exemptions below applies to the transferor(s)/seller(s), that transferor(s)/seller(s) is not required to pay estimated personal income tax to New York State under Tax Law, section 663. **Each** nonresident transferor/seller who qualifies under one of the exemptions below must sign in the space provided. If more space is needed, please photocopy this Schedule D and submit as many schedules as necessary to accommodate all nonresident transferors/sellers.

If none of these exemption statements apply, you must complete Form IT-2663, *Nonresident Real Property Estimated Income Tax Payment Form*, or Form IT-2664, *Nonresident Cooperative Unit Estimated Income Tax Payment Form.* For more information, see *Payment of estimated personal income tax,* on page 1 of Form TP-584-I.

Exemption for nonresident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) (grantor) of this real property or cooperative unit was a nonresident of New York State, but is not required to pay estimated personal income tax under Tax Law, section 663 due to one of the following exemptions:

☐ The real property or cooperative unit being sold or transferred qualifies in total as the transferor's/seller's principal residence (within the meaning of Internal Revenue Code, section 121) from _____ (Date) to _____ (Date) *(see instructions).*

☐ The transferor/seller is a mortgagor conveying the mortgaged property to a mortgagee in foreclosure, or in lieu of foreclosure with no additional consideration.

☐ The transferor or transferee is an agency or authority of the United States of America, an agency or authority of the state of New York, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage insurance company.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Liber 11271 of Deeds pg 1836

D 11271-1836

Box 116

FILED
OCT 27 2014
ERIE COUNTY
CLERK'S OFFICE

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36
OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 8th day of October, 2014 between Owner(s) Buffalo Development Corporation, having an office at 257 Franklin Street, City of Buffalo, County of Erie, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 267 Franklin Street and 432 Pearl Street in the City of Buffalo, County of Erie and State of New York, known and designated on the tax map of the County Clerk of Erie as tax map parcel numbers: Section 111.38 Block 2 Lot 20.1 and 4.1, being the same as that property conveyed to Grantor by deed dated May 27, 2014 and May 28, 2014 and recorded in the Erie County Clerk's Office in Liber and Page 11264/4198 and 11264/4898. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately .7 +/- acres, and is hereinafter more fully described in the Land Title Survey dated May 5, 2014 prepared by Millard, MacKay & Delles Land Surveyors, LLP, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is

extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C915237, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Erie County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining

contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation

Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5 the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by

Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C915237
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Buffalo Development Corporation:

By: Mark D. Croce

Print Name: MARK D. CROCE

Title: PRESIDENT Date: 10/2/14

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 3rd day of October, in the year 20 14, before me, the undersigned, personally appeared Mark D. Grace, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Deanne Stachowski
Notary Public - State of New York

DEANNE STACHOWSKI
Notary Public, State of New York
Qualified in Erie County
My Commission Expires Sept. 7, 2016

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 8th day of October, in the year 2014, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

SCHEDULE "A" PROPERTY DESCRIPTION

Property Description 267 Franklin

PARCEL A

ALL THAT CERTAIN PIECE OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of Outer Lot Number 18, bounded and described as follows:

BEGINNING on the easterly line of Franklin Street, 313 feet northerly from the northerly line of Chippewa Street; running thence easterly and parallel with Chippewa Street, 115 1/2 (115.50) feet; thence northerly parallel with Franklin Street, 40 feet; thence westerly parallel with Chippewa Street, 115 1/2 (115.50) feet; thence southerly on the easterly line of Franklin Street 40 feet to the place of beginning.

PARCEL B

ALL THAT CERTAIN PIECE OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of Outer Lot Number 18, bounded and described as follows:

BEGINNING at a point in the easterly line of Franklin Street, being 66 feet wide, distant 352.32 feet northerly from the intersection of said easterly line of Franklin Street with the northerly line of Chippewa Street (being 66 feet wide); thence northerly along the easterly line of Franklin Street, a record distance of 59 feet, more or less to a point, said point being a record distance of 53.50 feet southerly of the intersection of the north line of Outer Lot Number 18 and the easterly line of Franklin Street; thence easterly and parallel with said northerly line of Outer Lot Number 18 a measured distance of 111.41 feet; thence southerly and parallel with the easterly line of Franklin Street, a record distance of 59 feet, more or less, to a point in a line drawn easterly from the point of beginning and parallel with said northerly line of Outer Lot Number 18; thence westerly along said line and parallel with said northerly line of Outer Lot Number 18, a measured distance of 111.41 feet to the easterly line of Franklin Street at the point or place of beginning.

Property Description 432 Pearl

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie, State of New York, being part of Outer Lot number 18 and being more particularly described as follows:

BEGINNING at a point in the westerly line of Pearl Street distance 262.00 feet northerly of the north line of Chippewa Street; thence westerly and parallel to Chippewa Street 110.00 feet to the easterly line of Asbury Alley; thence northerly, along the easterly line of Asbury Alley and parallel to Pearl Street 177.40 feet to a point; thence easterly, parallel to Chippewa Street 110.00 feet to the westerly line of Pearl Street; thence southerly and along the westerly line of Pearl Street 177.40 feet to the point or place of beginning.

TP-584 (4/13)

New York State Department of Taxation and Finance

Combined Real Estate Transfer Tax Return, Credit Line Mortgage Certificate, and Certification of Exemption from the Payment of Estimated Personal Income Tax

Recording office time stamp

See Form TP-584-I, Instructions for Form TP-584, *before completing this form. Print or type.*

Schedule A — Information relating to conveyance

Grantor/Transferor

☐ Individual
☒ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Other

Name *(if individual, last, first, middle initial)* (☐ *check if more than one grantor)*: Buffalo Development Corporation

Social security number:

Mailing address: 257 Franklin Street

Social security number:

City: Buffalo | State: NY | ZIP code: 14202

Federal EIN: 16-1535033

Single member's name if grantor is a single member LLC *(see instructions)*:

Single member EIN or SSN:

Grantee/Transferee

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☒ Other

Name *(if individual, last, first, middle initial)* (☐ *check if more than one grantee)*: The People of the State of NY, acting through their Commissioner of the NYSDEC

Social security number:

Mailing address: 625 Broadway

Social security number:

City: Albany | State: NY | ZIP code: 12233

Federal EIN: 14-6013200

Single member's name if grantee is a single member LLC *(see instructions)*:

Single member EIN or SSN:

Location and description of property conveyed

Tax map designation – Section, block & lot *(include dots and dashes)*	SWIS code (six digits)	Street address	City, town, or village	County
111.38-2-20.1 111.38-2-4.1	140200	267 Franklin Street 432 Pearl Street	Buffalo	Erie

Type of property conveyed *(check applicable box)*

1 ☐ One- to three-family house
2 ☐ Residential cooperative
3 ☐ Residential condominium
4 ☐ Vacant land
5 ☒ Commercial/Industrial
6 ☐ Apartment building
7 ☐ Office building
8 ☐ Other _____

Date of conveyance: 10 | 08 | 2014 (month | day | year)

Percentage of real property conveyed which is residential real property 0 % *(see instructions)*

Condition of conveyance *(check all that apply)*

a. ☐ Conveyance of fee interest
b. ☐ Acquisition of a controlling interest (state percentage acquired _____ %)
c. ☐ Transfer of a controlling interest (state percentage transferred _____ %)
d. ☐ Conveyance to cooperative housing corporation
e. ☐ Conveyance pursuant to or in lieu of foreclosure or enforcement of security interest *(attach Form TP-584.1, Schedule E)*
f. ☐ Conveyance which consists of a mere change of identity or form of ownership or organization *(attach Form TP-584.1, Schedule F)*
g. ☐ Conveyance for which credit for tax previously paid will be claimed *(attach Form TP-584.1, Schedule G)*
h. ☐ Conveyance of cooperative apartment(s)
i. ☐ Syndication
j. ☐ Conveyance of air rights or development rights
k. ☐ Contract assignment
l. ☐ Option assignment or surrender
m. ☐ Leasehold assignment or surrender
n. ☐ Leasehold grant
o. ☐ Conveyance of an easement
p. ☒ Conveyance for which exemption from transfer tax claimed *(complete Schedule B, Part III)*
q. ☐ Conveyance of property partly within and partly outside the state
r. ☐ Conveyance pursuant to divorce or separation
s. ☒ Other *(describe)* Environmental Easement

For recording officer's use	Amount received	Date received	Transaction number
	Schedule B., Part I $ _____ Schedule B., Part II $		

Schedule B — Real estate transfer tax return (Tax Law, Article 31)

Part I – Computation of tax due

1	Enter amount of consideration for the conveyance *(if you are claiming a total exemption from tax, check the exemption claimed box, enter consideration and proceed to Part III)* ☒ **Exemption claimed**	1.	
2	Continuing lien deduction *(see Instructions if property is taken subject to mortgage or lien)*	2.	
3	Taxable consideration *(subtract line 2 from line 1)*	3.	
4	Tax: $2 for each $500, or fractional part thereof, of consideration on line 3	4.	
5	Amount of credit claimed for tax previously paid *(see Instructions and attach Form TP-584.1,* Schedule G*)*	5.	
6	Total tax due* *(subtract line 5 from line 4)*	6.	

Part II – Computation of additional tax due on the conveyance of residential real property for $1 million or more

1	Enter amount of consideration for conveyance *(from* Part I*, line 1)*	1.	
2	Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in* Schedule A*)*	2.	
3	Total additional transfer tax due* *(multiply line 2 by 1% (.01))*	3.	

Part III – Explanation of exemption claimed on Part I, line 1 *(check any boxes that apply)*

The conveyance of real property is exempt from the real estate transfer tax for the following reason:

a. Conveyance is to the United Nations, the United States of America, the state of New York, or any of their instrumentalities, agencies, or political subdivisions (or any public corporation, including a public corporation created pursuant to agreement or compact with another state or Canada) ..... a ☒

b. Conveyance is to secure a debt or other obligation ..... b ☐

c. Conveyance is without additional consideration to confirm, correct, modify, or supplement a prior conveyance ..... c ☐

d. Conveyance of real property is without consideration and not in connection with a sale, including conveyances conveying realty as bona fide gifts ..... d ☐

e. Conveyance is given in connection with a tax sale ..... e ☐

f. Conveyance is a mere change of identity or form of ownership or organization where there is no change in beneficial ownership. (This exemption cannot be claimed for a conveyance to a cooperative housing corporation of real property comprising the cooperative dwelling or dwellings.) Attach Form TP-584.1, Schedule F ..... f ☐

g. Conveyance consists of deed of partition ..... g ☐

h. Conveyance is given pursuant to the federal Bankruptcy Act ..... h ☐

i. Conveyance consists of the execution of a contract to sell real property, without the use or occupancy of such property, or the granting of an option to purchase real property, without the use or occupancy of such property ..... i ☐

j. Conveyance of an option or contract to purchase real property with the use or occupancy of such property where the consideration is less than $200,000 and such property was used solely by the grantor as the grantor's personal residence and consists of a one-, two-, or three-family house, an individual residential condominium unit, or the sale of stock in a cooperative housing corporation in connection with the grant or transfer of a proprietary leasehold covering an individual residential cooperative apartment ..... j ☐

k. Conveyance is not a conveyance within the meaning of Tax Law, Article 31, section 1401(e) *(attach documents supporting such claim)* ..... k ☐

*The total tax (from Part I, line 6 and Part II, line 3 above) is due within 15 days from the date conveyance. Please make check(s) payable to the county clerk where the recording is to take place. If the recording is to take place in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, make check(s) payable to the ***NYC Department of Finance.*** If a recording is not required, send this return and your check(s) made payable to the ***NYS Department of Taxation and Finance,*** directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-5045.

Schedule C — Credit Line Mortgage Certificate (Tax Law, Article 11)

Complete the following only if the interest being transferred is a fee simple interest.
I (we) certify that: *(check the appropriate box)*

1. ☒ The real property being sold or transferred is not subject to an outstanding credit line mortgage.

2. ☐ The real property being sold or transferred is subject to an outstanding credit line mortgage. However, an exemption from the tax is claimed for the following reason:
   - ☐ The transfer of real property is a transfer of a fee simple interest to a person or persons who held a fee simple interest in the real property (whether as a joint tenant, a tenant in common or otherwise) immediately before the transfer.
   - ☐ The transfer of real property is (A) to a person or persons related by blood, marriage or adoption to the original obligor or to one or more of the original obligors or (B) to a person or entity where 50% or more of the beneficial interest in such real property after the transfer is held by the transferor or such related person or persons (as in the case of a transfer to a trustee for the benefit of a minor or the transfer to a trust for the benefit of the transferor).
   - ☐ The transfer of real property is a transfer to a trustee in bankruptcy, a receiver, assignee, or other officer of a court.
   - ☐ The maximum principal amount secured by the credit line mortgage is $3,000,000 or more, and the real property being sold or transferred is **not** principally improved nor will it be improved by a one- to six-family owner-occupied residence or dwelling.

     Please note: for purposes of determining whether the maximum principal amount secured is $3,000,000 or more as described above, the amounts secured by two or more credit line mortgages may be aggregated under certain circumstances. See TSB-M-96(6)-R for more information regarding these aggregation requirements.
   - ☐ Other *(attach detailed explanation).*

3. ☐ The real property being transferred is presently subject to an outstanding credit line mortgage. However, no tax is due for the following reason:
   - ☐ A certificate of discharge of the credit line mortgage is being offered at the time of recording the deed.
   - ☐ A check has been drawn payable for transmission to the credit line mortgagee or his agent for the balance due, and a satisfaction of such mortgage will be recorded as soon as it is available.

4. ☐ The real property being transferred is subject to an outstanding credit line mortgage recorded in _____ (insert liber and page or reel or other identification of the mortgage). The maximum principal amount of debt or obligation secured by the mortgage is _____. No exemption from tax is claimed and the tax of _____ is being paid herewith. *(Make check payable to county clerk where deed will be recorded or, if the recording is to take place in New York City but not in Richmond County, make check payable to the* ***NYC Department of Finance.****)*

Signature (both the grantor(s) and grantee(s) must sign)

The undersigned certify that the above information contained in schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of his/her knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

Grantor signature	Title	Grantee signature	Title
Mark D. Crocc	PRESIDENT		Assoc. Atty
		NYSDEC	NYS DEC
Grantor signature	Title	Grantee signature	Title

Reminder: Did you complete all of the required information in Schedules A, B, and C? Are you required to complete Schedule D? If you checked *e*, *f*, or *g* in Schedule A, did you complete Form TP-584.1? Have you attached your check(s) made payable to the county clerk where recording will take place or, if the recording is in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, to the ***NYC Department of Finance***? If no recording is required, send your check(s), made payable to the ***Department of Taxation and Finance,*** directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-5045.

Schedule D - Certification of exemption from the payment of estimated personal income tax (Tax Law, Article 22, section 663)

Complete the following only if a fee simple interest or a cooperative unit is being transferred by an individual or estate or trust.

If the property is being conveyed by a referee pursuant to a foreclosure proceeding, proceed to Part II, and check the second box under *Exemptions for nonresident transferor(s)/seller(s)* and sign at bottom.

Part I - New York State residents

If you are a New York State resident transferor(s)/seller(s) listed in Schedule A of Form TP-584 (or an attachment to Form TP-584), you must sign the certification below. If one or more transferors/sellers of the real property or cooperative unit is a resident of New York State, **each** resident transferor/seller must sign in the space provided. If more space is needed, please photocopy this Schedule D and submit as many schedules as necessary to accommodate all resident transferors/sellers.

Certification of resident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) as signed below was a resident of New York State, and therefore is not required to pay estimated personal income tax under Tax Law, section 663(a) upon the sale or transfer of this real property or cooperative unit.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Note: A resident of New York State may still be required to pay estimated tax under Tax Law, section 685(c), but not as a condition of recording a deed.

Part II - Nonresidents of New York State

If you are a nonresident of New York State listed as a transferor/seller in Schedule A of Form TP-584 (or an attachment to Form TP-584) but are not required to pay estimated personal income tax because one of the exemptions below applies under Tax Law, section 663(c), check the box of the appropriate exemption below. If any one of the exemptions below applies to the transferor(s)/seller(s), that transferor(s)/seller(s) is not required to pay estimated personal income tax to New York State under Tax Law, section 663. **Each** nonresident transferor/seller who qualifies under one of the exemptions below must sign in the space provided. If more space is needed, please photocopy this Schedule D and submit as many schedules as necessary to accommodate all nonresident transferors/sellers.

If none of these exemption statements apply, you must complete Form IT-2663, *Nonresident Real Property Estimated Income Tax Payment Form*, or Form IT-2664, *Nonresident Cooperative Unit Estimated Income Tax Payment Form.* For more information, see *Payment of estimated personal income tax,* on page 1 of Form TP-584-I.

Exemption for nonresident transferor(s)/seller(s)

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor(s)/seller(s) (grantor) of this real property or cooperative unit was a nonresident of New York State, but is not required to pay estimated personal income tax under Tax Law, section 663 due to one of the following exemptions:

☐ The real property or cooperative unit being sold or transferred qualifies in total as the transferor's/seller's principal residence (within the meaning of Internal Revenue Code, section 121) from _____ (Date) to _____ (Date) *(see instructions)*.

☐ The transferor/seller is a mortgagor conveying the mortgaged property to a mortgagee in foreclosure, or in lieu of foreclosure with no additional consideration.

☐ The transferor or transferee is an agency or authority of the United States of America, an agency or authority of the state of New York, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage insurance company.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

APPENDIX B

EXCAVATION WORK PLAN

BROWNFIELD CLEANUP PROGRAM

APPENDIX B
EXCAVATION WORK PLAN

275 FRANKLIN STREET SITE, BCP SITE NO. C915208
AND
432 PEARL STREET SITE NO. C915237
BUFFALO, NEW YORK

July 2014
Revised January 2015
Updated May 2017

0156-016-002

Prepared for:
BUFFALO DEVELOPMENT CORPORATION

Prepared by:

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

In Association With:

TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SITE MANAGEMENT PLAN
APPENDIX B: EXCAVATION WORK PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES

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SITE MANAGEMENT PLAN
APPENDIX B: EXCAVATION WORK PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES

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LIST OF TABLES

ATTACHMENTS

B-1: INTRODUCTION

This document is a required element of the remedial program for the New York State Brownfield Cleanup Program (BCP) Sites C915208 (275 Franklin Street Site) and C915237 (432 Pearl Street Site) located in the City of Buffalo, Erie County, New York (hereinafter referred to as the BCP Sites).

This Excavation Work Plan (EWP) has been prepared by Benchmark Environmental Engineering & Science, PLLC (Benchmark) in association with TurnKey Environmental Restoration, LLC (TurnKey) in accordance with NYSDEC Program Policy DER-10.

B-2: NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the Site owner or their representative will notify the Department. Currently, this notification will be made to:

Regional Hazardous Waste Remediation Engineer
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent; plans for re-grading, intrusive elements or utilities to be installed below the cover system; estimated volumes of contaminated soil to be excavated; and any work that may impact an existing engineering control. Appropriate locations for staging and stockpiling of non-impacted and impacted (if encountered) soil/fill materials will also be identified.
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling
- A schedule for the work, detailing the start and completion of all intrusive work
- A summary of the applicable components of this EWP
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120

- A copy of the contractor's health and safety plan, in electronic format, if it differs from the Health and Safety Plan (HASP) provided in Appendix C of this document
- Identification of disposal facilities for potential waste streams
- Identification of sources of any anticipated backfill, along with all required chemical testing results

B-3: SOIL SCREENING METHODS

Visual, olfactory, and instrument-based (PID) soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

B-4: STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

B-5: MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional (QEP) or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this EWP.

The presence of utilities and easements on the Site will be investigated by the QEP. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash may be operated on-site, if Site conditions warrant. The QEP will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The QEP will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

B-6: MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and either treated and discharged on-Site under a permit with the Buffalo Sewer Authority or disposed of off-site in an appropriate manner.

Truck transport routes will be pre-determined for wastes designated as hazardous and requiring off-site transport to a secure landfill (RCRA Subtitle C facility) or other RCRA-permitted Treatment Storage and Disposal Facility (TSDF). The truck transport route to the nearest Subtitle C facility from the Site is as follows:

<u>To Model City Landfill, 4746 Model City Rd., Model City, NY</u>

- Head north on Franklin St

- Turn left on Ridge Rd
- Merge onto NY-5/Buffalo Skyway N
- Merge onto I-190 N
- Take Exit 25A/RT 265
- Turn left onto Military Rd/RT 265
- Turn right onto Upper Mountain Rd/County Hwy 11
- Turn slight left onto Indian Hill Rd
- Turn slight left onto Model City Rd/County Hwy 8
- End at 4746 Model City Rd.

All trucks loaded with Site materials will exit the vicinity of the Site using only approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. If an alternate RCRA Subtitle C facility or TSDF is employed the corresponding truck transport route shall be provided to the NYSDEC for approval.

Trucks will be prohibited from stopping and idling in the neighborhood outside the Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials. Queuing of trucks will be performed on-site in order to minimize off-site disturbance; off-site queuing will be prohibited.

B-7: MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated

documentation will be reported to the NYSDEC in the Periodic Review Report (PRR). This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading, and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 USCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

B-8: MATERIALS REUSE ON-SITE

On-site reuse of material is acceptable provided the material does not exhibit visual or olfactory evidence of contamination and photoionization detector (PID) measurements of the atmosphere at the soil/fill interface do not exceed 5 parts per million above background. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-site.

B-9: FLUIDS MANAGEMENT

All liquids to be removed from the Site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge, and development fluids will not be recharged back to the land surface or subsurface of the Site, unless under a permit with the Buffalo Sewer Authority to properly treat and discharge the fluids.

Water generated during large-scale construction activities proposed for discharge to surface waters (i.e., a local pond, stream, or river) will require a NY State Pollutant Discharge Elimination System (SPDES) permit.

B-10: COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Decision Document. If the disturbed area of the Site will not be covered with impermeable surface (e.g., concrete foundations/walks or asphalt parking), a demarcation layer, consisting of orange poly netting or equivalent non-degradable material will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone,' the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the Remaining Contamination. A figure showing the modified surface will be included in the subsequent PRR and in any updates to the SMP.

B-11: BACKFILL FROM OFF-SITE SOURCES

The criteria under which off-site material may be used as subgrade backfill are presented below.

- **Off-Site Soil/Fill:** Off-site soil/fill may be used as subgrade backfill provided that it originates from: 1) an NYSDEC-approved borrow site; or 2) a known source having no evidence of disposal or releases of hazardous substances, hazardous, toxic or radioactive wastes, or petroleum. In both instances the imported soil must be tested and demonstrated to meet the criteria shown on Table B-1 in accordance with Appendix 5 of DER-10. In addition, no off-site materials meeting the definition of a solid waste as defined in 6 NYCRR, Part 360-1.2 (a) shall be used as backfill. The criteria presented in Table B-1 represent the lesser of RRSCOs or levels protective of groundwater quality as published in 6NYCRR Part 375-6.7(d)(c) and 375-6.8.
- **Other Off-Site Material:** Certain material may be imported as backfill, without chemical testing, provided it contains less than 10% (by weight) material that would pass through a size 80 sieve: 1) Rock or stone, consisting of virgin material from a permitted mine or quarry; 2) steel slag under BUD #555-9-152; 3) Recycled concrete, brick, or asphalt from a NYSDEC-registered or permitted C&D debris processing facility (as specified in Section 360-16.1 of 6 NYCRR Part

> 360) that conforms to Section 304 of the New York State Department of Transportation Standard Specifications Construction and Materials Volume 1 (2002). As stated in Section 360-16.4(b)(2), the facility may only accept recognizable, uncontaminated, non-pulverized C&D debris or C&D debris from other authorized C&D processing facilities. According to Section 360-16.2(c), "uncontaminated" means C&D debris that is not mixed or commingled with other solid waste at the point of generation, processing, or disposal, and that is not contaminated with spills of a petroleum product, hazardous waste, or industrial waste.

As indicated above, off-site borrow soils shall be tested to assure conformance with the criteria identified on Table B-1, which are based on an evaluation of the land use, protection of groundwater criteria, and protection of ecological resources criteria. All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). A tiered approach based on the volume of impacted soil/fill being excavated will be used to determine the frequency of characterization sampling in accordance with DER-10 or as pre-approved by the NYSDEC.

Grab samples will be collected for VOC analysis. For all other required analyses, a minimum of four grab samples will be collected to form a single composite sample. Approximately equal aliquots of the grab samples will be composited in the field using a stainless steel trowel and bowl. The trowel and bowl shall be decontaminated with a non-phosphate detergent (e.g., Alconox®) and potable water wash solution followed by a distilled water rinse between sampling locations. The soil/fill samples will be analyzed for USEPA Target Compound List (TCL) VOCs, TCL SVOCs, pesticides, and PCBs, as well as select metals[2] and cyanide in accordance with USEPA SW-846 Methodology by a NYSDOH ELAP-certified laboratory. Analytical results will be compared to Table B-1 criteria and provided to the NYSDEC as part of the approval process and reported in the PRR. Analytical results must be maintained on file for review in support of the periodic Engineering and Institutional Control (IC/EC) certification required as part of the final SMP.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior

[2] Metals shall include those regulated under 6NYCRR Part 375-6.8, which presently include: arsenic; barium; beryllium; cadmium; chromium (total and hexavalent forms); copper; lead; manganese; mercury; nickel; selenium; silver; and zinc.

approval by NYSDEC. Solid waste will not be imported onto the Site. Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site unless sampled in accordance with DER-10 and approved by NYSDEC.

All materials proposed for import onto the Site will be approved by the QEP and in compliance with the provisions of this EWP prior to receipt at the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

B-12: STORMWATER POLLUTION PREVENTION

If construction activities disturb more than 1 acre of land, the Federal Water Pollution Control Act (as amended, 33 U.S.C. 1251 et. seq.) and the New York State Environmental Conservation Law (Article 17, Titles 7 and 8, and Article 70) would apply.

With some exceptions, operators of construction activities that will result in the disturbance of 1 or more acres of land must obtain coverage under SPDES General Permit (GP-0-15-002; expires 01/28/20) prior to the commencement of soil disturbance. Also requiring a permit are construction activities disturbing less than 1 acre if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than 1 acre, or activities that are designated by the NYSDEC. The NYSDEC can require a permit for construction activities disturbing less than 1 acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

To obtain coverage under the General Permit, the operator of a construction activity must file a completed Notice of Intent (NOI) with the NYSDEC. Submitting a NOI is an affirmation that a Storm Water Pollution Prevention Plan (SWPPP) has been prepared for the Site and will be implemented prior to the commencement of construction activities. Coverage under the General Permit will begin either 5 or 60 business days after receipt of a completed NOI by the NYSDEC. Attachment B-1 includes the SPDES General Permit for Storm Water Discharges from Construction Activity (GP-0-15-002). NYSDEC is now allowing owners/operators of construction activities to electronically complete and file their Notice of Intent (eNOI) for coverage under the SPDES General Permit. Attachment B-1 includes instructions on how to complete the eNOI.

For smaller disturbances not subject to SPDES General Permit requirements, erosion controls must be installed as necessary to mitigate impacted stormwater and sediment runoff. These controls (which may include silt fencing around stockpiles, berms, and hay bale checks) will be required in areas of disturbance proximate to surface water bodies and drainage structures, and will also be required if disturbances occur in areas where the surrounding slag/fill is not sufficiently permeable to allow re-infiltration. Erosion and sediment controls shall be installed in accordance with the standards and specifications presented in Attachment B-2.

The controls will be installed and inspected once a week and after every storm event. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the controls functional. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Results of inspections will be recorded in a logbook, maintained by the Site Owner or Owner's representative, and made available for inspection by NYSDEC.

B-13: CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC

Spills Hotline. These findings will be also included in the PRR prepared pursuant to Section 5 of the SMP.

B-14: COMMUNITY AIR MONITORING PLAN

As detailed in Appendix C, the following criteria shall also be adhered to for the protection of the nearby community.

Organic Vapor Community Air Monitoring:

Community air monitoring will be performed at the downwind perimeter of the exclusion zone on a continuous basis during intrusive activities performed outdoors that may be reasonably expected to potentially release organic vapors, or when sustained readings are detected in the work zone (i.e., proximate to the source of the intrusive activity). Otherwise, the monitoring will be performed on an hourly basis. A photoionization detector or other equipment will be suitable to the types of contaminants known or suspected to be present will be used, and will be capable of calculating 15-minute running average concentrations. All air monitoring equipment will be calibrated at least daily and an upwind concentration will be taken at least daily to establish background conditions. The 15-minute average concentrations will be compared to the levels specified below.

- If the 15-minute ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone exceeds 5 ppm above background, work activities will be halted and monitoring continued. If the organic vapor decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If the ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone persists at levels above 5 ppm over background but less than 25 ppm, activities must be halted, the source of vapors identified, corrective actions to abate the emissions taken, and monitoring continued. After these steps, work activities can resume provided that: the organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest off-site potential receptor or residential or commercial structure, whichever is less - but in no case less than 20 feet - is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the exclusion zone, work activities must be shut down and the following activities will be performed:

- All Emergency Response Contacts as listed in the HASP (Appendix C) and the Emergency Response Plan (Attachment C-1 to the HASP) will be advised.
- The local police authorities will immediately be contacted by the Site Health and Safety Officer and advised of the situation.
- Air monitoring will be continued at 1/2 the distance from the exclusion zone to the nearest receptor.

All readings will be recorded and will be available for NYSDEC and NYSDOH personnel to review.

Explosive Vapor Community Air Monitoring

Explosive vapor community air monitoring will be performed at the downwind perimeter of the site on a continuous basis whenever sustained atmospheric concentrations of greater than 10% of the LEL are recorded in the exclusion zone. If sustained atmospheric concentrations of greater than 10% LEL are recorded at the downwind site perimeter, the local Fire Department will be contacted (see Table 7 in Section 2.5.1 of the SMP for phone number).

Airborne Particulate Community Air Monitoring

Respirable (PM-10) particulate monitoring will be performed on a continuous basis at the upwind and downwind perimeter of the exclusion zone. The monitoring will be performed using real-time monitoring equipment capable of measuring PM-10 and integrating over a period of 15-minutes for comparison to the airborne particulate action levels. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. All readings will be recorded and will be available for NYSDEC and NYSDOH review. Readings will be interpreted as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m^3) greater than the background (upwind perimeter) reading 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 provided that the downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and that visible dust is not migrating from the work area.

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

Air sampling stations will be located based on generally prevailing wind conditions. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

B-15: ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis are described below. If nuisance odors are identified at the Site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the PRR.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

B-16: DUST CONTROL PLAN

Particulate monitoring will be performed along the downwind perimeter of the Site during subgrade excavation, grading, and handling activities in accordance with the requirements for community air monitoring at remediation sites as established by the NYSDOH and NYSDEC. Accordingly, it follows procedures and practices outlined under DER-10 Appendix 1A (NYSDOH's Generic Community Air Monitoring Plan) and Appendix 1B (Fugitive Dust and Particulate Monitoring); included as Attachment B-3. Dust suppression techniques will be employed as necessary to mitigate fugitive dust from non-vegetated or disturbed soil/fill.

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.
- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-site.
- Covering or proof-rolling excavated areas and materials after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.

All reasonable attempts will be made to keep visible and/or fugitive dust to a minimum.

B-17: OTHER NUISANCES

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances. At a minimum, this shall include limiting construction to typical daylight work hours.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE B-1

CRITERIA FOR IMPORTED SOILS

Excavation Work Plan
275 Franklin Street & 432 Pearl Street Sites
Buffalo, New York

Parameter	Cover Soil Criteria[1]
Volatile Organic Compounds (mg/kg)	
1,1,1-Trichloroethane	0.68
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02
1,2-Dichloroethene(cis)	0.25
1,2-Dichloroethene(trans)	0.19
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1
Acetone	0.05
Benzene	0.06
Butylbenzene	12
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene	1
Hexachlorobenzene	1.2
Methyl ethyl ketone	0.12
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
Propylbenzene-n	3.9
Sec-Butylbenzene	11
Tert-Butylbenzene	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47
Trimethylbenzene-1,2,4	3.6
Trimethylbenzene-1,3,5	8.4
Vinyl chloride	0.02
Xylene (mixed)	1.6

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE B-1

CRITERIA FOR IMPORTED SOILS

Excavation Work Plan
275 Franklin Street & 432 Pearl Street Sites
Buffalo, New York

Parameter	Cover Soil Criteria[1]
Semi-Volatile Organic Compounds (mg/kg)	
Acenaphthene	98
Acenaphthylene	100
Anthracene	100
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(g,h,i)perylene	100
Benzo(k)fluoranthene	1.7
Chrysene	1
Dibenz(a,h)anthracene	0.33
Fluoranthene	100
Fluorene	100
Indeno(1,2,3-cd)pyrene	0.5
m-Cresol(s)	0.33
Naphthalene	12
o-Cresol(s)	0.33
p-Cresol(s)	0.33
Pentachlorophenol	0.8
Phenanthrene	100
Phenol	0.33
Pyrene	100
Metals (mg/kg)	
Arsenic	16
Barium	400
Beryllium	47
Cadmium	4.3
Chromium, Hexavalent[2]	19
Chromium, Trivalent[2]	180
Copper	270
Cyanide	27
Lead	400
Manganese	2,000
Mercury (total)	0.73

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE B-1

CRITERIA FOR IMPORTED SOILS

Excavation Work Plan
275 Franklin Street & 432 Pearl Street Sites
Buffalo, New York

Parameter	Cover Soil Criteria[1]
Metals (mg/kg)	
Nickel	130
Selenium	4
Silver	8.3
Zinc	2,480
PCBs/Pesticides (mg/kg)	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE	8.9
4,4'-DDT	7.9
4,4'-DDD	13
Aldrin	0.097
Alpha-BHC	0.02
Beta-BHC	0.09
Chlordane (alpha)	2.9
Delta-BHC	0.25
Dibenzofuran	59
Dieldrin	0.1
Endosulfan I	24
Endosulfan II	24
Endosulfan sulfate	24
Endrin	0.06
Heptachlor	0.38
Lindane	0.1
Polychlorinated biphenyls	1

Notes:

1. Soil criteria are lesser of concentrations protective of groundwater or restricted-residential health-based soil cleanup objectives per 6 NYCRR 375-6.8(b).
2. The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.

ATTACHMENT B-1

STORM WATER POLLUTION PREVENTION

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

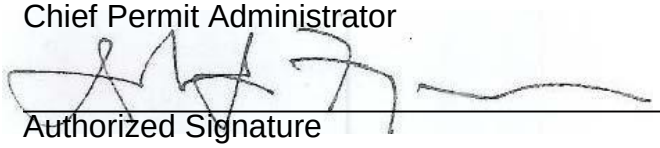
CONSTRUCTION ACTIVITY

Permit No. GP-0-15-002

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2015 Expiration Date: January 28, 2020

John J. Ferguson
Chief Permit Administrator



1 / 12 / 15

Authorized Signature Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("permit") is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:

http://www.dec.ny.gov/

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES
FROM CONSTRUCTION ACTIVITIES

Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

*Discharge*s authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the Stormwater Pollution Prevention Plan (“SWPPP”) the reason(s) for the deviation or alternative design and provide information

which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:

   (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharge*s;

   (ii) Control stormwater *discharge*s to *minimize* channel and streambank erosion and scour in the immediate vicinity of the *discharge* points;

   (iii) *Minimize* the amount of soil exposed during *construction activity*;

   (iv) *Minimize* the disturbance of *steep slopes*;

   (v) *Minimize* sediment *discharge*s from the site;

   (vi) Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharge*s, unless *infeasible*;

   (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted; and

   (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover.

b. **Soil Stabilization**. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

c. **Dewatering**. *Discharge*s from dewatering activities, including *discharge*s

from dewatering of trenches and excavations, must be managed by appropriate control measures.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:

(i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;

(ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and

(iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited *Discharge*s.** The following *discharge*s are prohibited:

(i) Wastewater from washout of concrete;

(ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

(iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;

(iv) Soaps or solvents used in vehicle and equipment washing; and

(v) Toxic or hazardous substances from a spill or other release.

f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion

at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices ("SMPs") are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. ***Sizing Criteria* for *New Development***

(i) Runoff Reduction Volume ("RRv"): Reduce the total Water Quality Volume ("WQv") by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv

that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume ("Cpv"): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:

(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or

(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) Overbank Flood Control Criteria ("Qp"): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or

(2) A downstream analysis reveals that overbank control is not required.

(v) Extreme Flood Control Criteria ("Qf"): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or

(2) A downstream analysis reveals that overbank control is not required.

b. ***Sizing Criteria* for *New Development* in Enhanced Phosphorus Removal Watershed**

(i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be calculated in accordance with the criteria in Section 10.3 of the Design Manual.

(ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or

standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible.*

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

(iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:

(1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or

(2) The site *discharge*s directly to tidal waters, or fifth order or larger streams.

(iv) Overbank Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

(v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:

(1) the site *discharge*s directly to tidal waters or fifth order or larger streams, or
(2) A downstream analysis reveals that overbank control is not required.

c. ***Sizing Criteria* for *Redevelopment Activity***

(Part I.C.2.c.i)

(i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.

(1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or
(2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or
(3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or
(4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

(ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(iii) Overbank Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

(Part I.C.2.c.iv)

(iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.

d. ***Sizing Criteria*** **for Combination of** ***Redevelopment Activity*** **and** ***New Development***

Construction projects that include both *New Development* and *Redevelopment Activity* shall provide post-construction stormwater management controls that meet the *sizing criteria* calculated as an aggregate of the *Sizing Criteria* in Part I.C.2.a. or b. of this permit for the *New Development* portion of the project and Part I.C.2.c of this permit for *Redevelopment Activity* portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharge*s necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharge*s authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharge*s authorized by this permit are causing or contributing to a violation of *water quality standards*, or

if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharge*s will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharge*s from *construction activities*.

3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater *discharges* may be authorized by this permit: *discharge*s from firefighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated *groundwater* or spring water; uncontaminated *discharge*s from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who *discharge* as noted in this paragraph, and with the exception of flows from firefighting activities, these *discharge*s must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.

4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

(Part I.F)

1. *Discharge*s after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharge*s that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;

4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an endangered or threatened species unless the *owner or operator* has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.C.2 of this permit.

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which disturb one or more acres of land with no existing *impervious cover*; and

   c. Which are undertaken on land with a Soil Slope Phase that is identified as an E or F, or the map unit name is inclusive of 25% or greater slope, on the United States Department of Agriculture (“USDA”) Soil Survey for the County where the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects:

   a. Where the *discharge*s from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and

   b. Which disturb two or more acres of land with no existing *impervious cover*; and

   c. Which are undertaken on land with a Soil Slope Phase that is identified as an E or F, or the map unit name is inclusive of 25% or greater slope, on the USDA Soil Survey for the County where the disturbance will occur.

(Part I.F.8)

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.C.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:

   a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the construction site within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the construction site within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.

      - 1-5 acres of disturbance - 20 feet
      - 5-20 acres of disturbance - 50 feet
      - 20+ acres of disturbance - 100 feet, or

   b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
      (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
      (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
      (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
      (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or

   c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:
      (i) No Affect
      (ii) No Adverse Affect

(Part I.F.8.c.iii)

(iii) Executed Memorandum of Agreement, or

d. Documentation that:

(i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharge*s from *construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

II. Part II. OBTAINING PERMIT COVERAGE

A. Notice of Intent (NOI) Submittal

1. An *owner or operator* of a *construction activity* that is <u>not</u> subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the Department in order to be authorized to *discharge* under this permit. An *owner or operator* shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (http://www.dec.ny.gov/). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address.

NOTICE OF INTENT
NYS DEC, Bureau of Water Permits
625 Broadway, 4th Floor
Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department. An *owner or operator* shall use either the electronic (eNOI) or paper version of the NOI.

The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the address in Part II.A.1.

(Part II.A.2)

The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of *Owner or Operator*) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4*.

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:

   a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (http://www.dec.ny.gov/) for more information,

   b. where required, all necessary Department permits subject to the *Uniform Procedures Act ("UPA")* (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

   c. the final SWPPP has been prepared, and

   d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.B.2 above

(Part II.B.3)

will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or

(ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;

(iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

(i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed "*MS4* SWPPP Acceptance" form, or

(ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed "MS4 SWPPP Acceptance" form.

4. The Department may suspend or deny an *owner's or operator's* coverage

(Part II.B.4)

under this permit if the Department determines that the SWPPP does not meet the permit requirements. In accordance with statute, regulation, and the terms and conditions of this permit, the Department may deny coverage under this permit and require submittal of an application for an individual SPDES permit based on a review of the NOI or other information pursuant to Part II.

5. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.B. of this permit.

C. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination ("NOT") has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-15-002), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, and all documentation necessary to demonstrate eligibility with this permit at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

   a. The *owner or operator* shall

(Part II.C.3.a)

have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005.

c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The *owner or operator* shall install any additional site specific practices needed to protect water quality.

e. The *owner or operator* shall include the requirements above in their SWPPP.

4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the *regulated, traditional land use control MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice

(Part II.D)

D. Permit Coverage for Discharges Authorized Under GP-0-10-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-10-001), an *owner or operator* of *a construction activity* with coverage under GP-0-10-001, as of the effective date of GP-0-15-002, shall be authorized to *discharge* in accordance with GP-0-15-002, unless otherwise notified by the Department.

   An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-15-002.

E. Change of *Owner or Operator*

2. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.A.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

(Part III)

III. Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP:

   a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

   b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the *discharge* of *pollutants*; and

   c. to address issues or deficiencies identified during an inspection by the *qualified inspector,* the Department or other regulatory authority.

5. The Department may notify the *owner or operator* at any time that the

(Part III.A.5)

SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.C.4. of this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

   The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

   > "I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharge*s from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

   In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the

trained contractor responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

   a. Background information about the scope of the project, including the location, type and size of project;

   b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge*(s);

   c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

   d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other

activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005. Include the reason for the deviation or alternative design

and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

   Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

   The post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

   b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

   c. A Stormwater Modeling and Analysis Report that includes:

      (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;

      (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;

      (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;

      (iv) Summary table, with supporting calculations, which demonstrates

that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;

(v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and

(vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;

d. Soil testing results and locations (test pits, borings);

e. Infiltration test results, when required; and

f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria,* Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

(Part IV)

IV. Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

(Part IV.C)

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:

   a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

   c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

   d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

   a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

   b. For construction sites where soil disturbance activities are on-going and

the *owner or operator* has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization,* and all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.A.1 of this permit.

e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall

be separated by a minimum of two (2) full calendar days.

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization,* all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of *discharge* from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

a. Date and time of inspection;

b. Name and title of person(s) performing inspection;

c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

d. A description of the condition of the runoff at all points of *discharge* from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;

g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;

(Part IV.C.4.i)

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

k. Identification and status of all corrective actions that were required by previous inspection; and

l. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.C.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

V. Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.

(Part V.A.2)

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

   a. Total project completion - All *construction activity* identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

   b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

   c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E. of this permit.

   d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "*Final Stabilization*" and "Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the "MS4 Acceptance" statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector*'s final site inspection certification(s) required in Part V.A.3. of this permit.

(Part V.A.5)

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

   a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

   b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

   c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the *owner or operator's* deed of record,

   d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

VI. Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

(Part VII)

VII. Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit , or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:

   a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

      (i) a president, secretary, treasurer, or vice-president of the

corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

(ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

(i) the chief executive officer of the agency, or

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named

(Part VII.H.2.b)

individual or any individual occupying a named position) and,

c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any *owner or operator* authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any *discharge*r authorized by a general permit to apply for an individual SPDES permit, it shall notify the *discharge*r in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from *owner or operator* receipt of the notification letter, whereby the authorization to

discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge*(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a construction site which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.

4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

(Part VII.N)

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with *construction activity* covered by this permit, the *owner or operator* of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

VIII. **APPENDIX A**

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both “sewage” and “stormwater”.

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for “*Construction Activity(ies)*” also.

***Construction Activity*(ies) -** means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied

on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State
or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term “plan” in “larger common plan of development or sale” is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters,

ditches, man-made
channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*

(ii) Designed or used for collecting or conveying stormwater;

(iii) Which is not a *combined sewer*; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

New Development – means any land disturbance that does meet the definition of Redevelopment Activity included in this appendix.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

Performance Criteria – means the design criteria listed under the "Required Elements" sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York..

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), Overbank Flood (Qp), and Extreme Flood (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area with a Soil Slope Phase that is identified as an E or F, or

the map unit name is inclusive of 25% or greater slope, on the United States Department of Agriculture (“USDA”) Soil Survey for the County where the disturbance will occur.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part

621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

IX. APPENDIX B

Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C or not *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E
- Construction of a barn or other agricultural building, silo, stock yard or pen.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Bike paths and trails
- Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics
- Spoil areas that will be covered with vegetation
- Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that *alter hydrology from pre to post development* conditions
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

- All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

Table 2

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover,* and constructed as part of an over-head electric transmission line project , wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

X. **APPENDIX C**

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River **-** Figure 1
- Onondaga Lake Watershed **-** Figure 2
- Greenwood Lake Watershed **-**Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

Figure 1 - New York City Watershed East of the Hudson

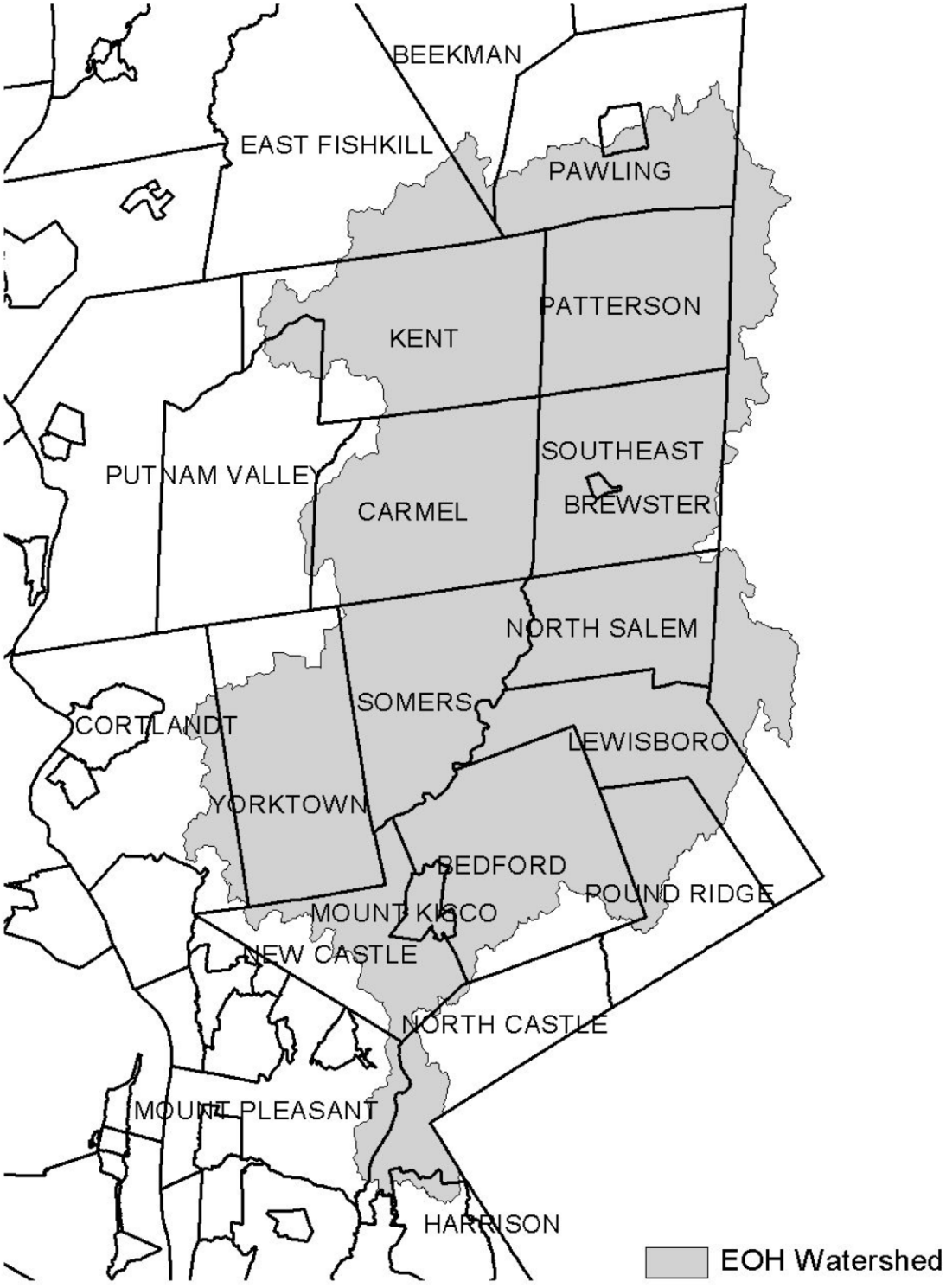


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

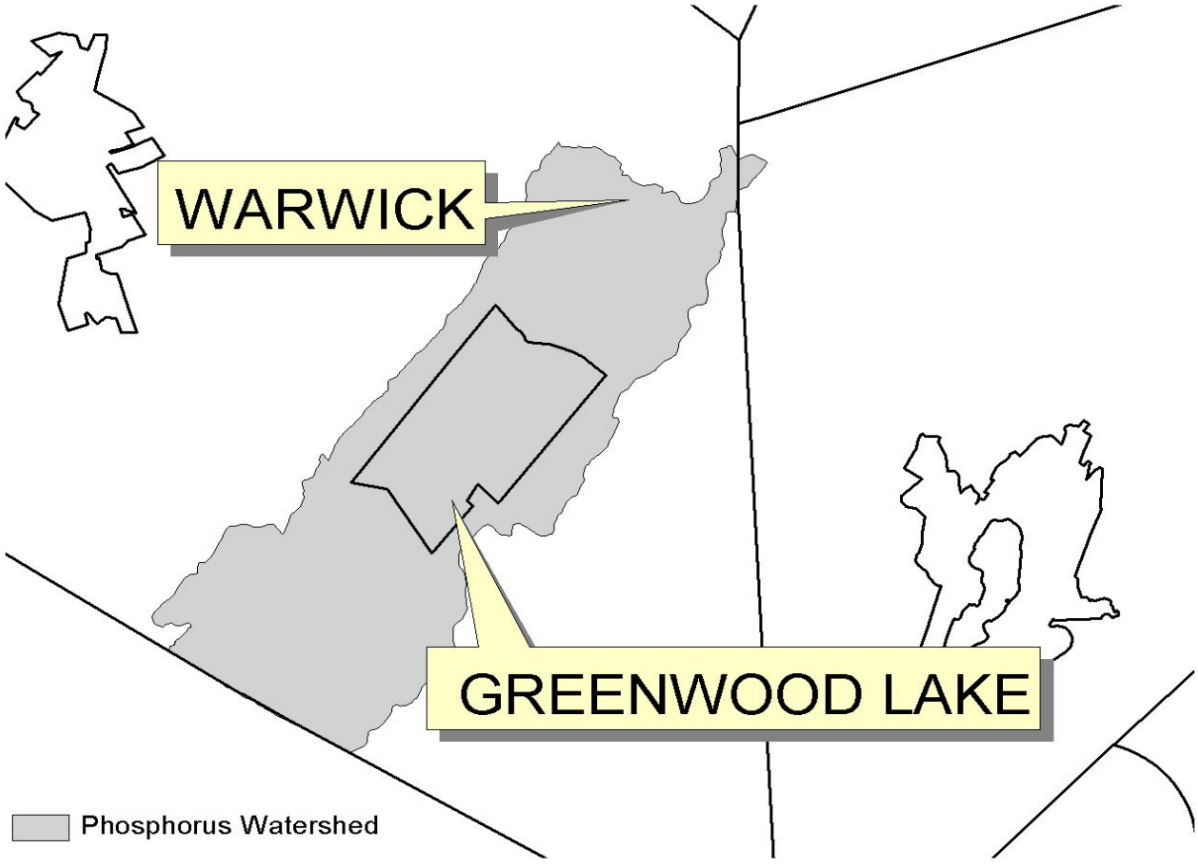


Figure 4 - Oscawana Lake Watershed

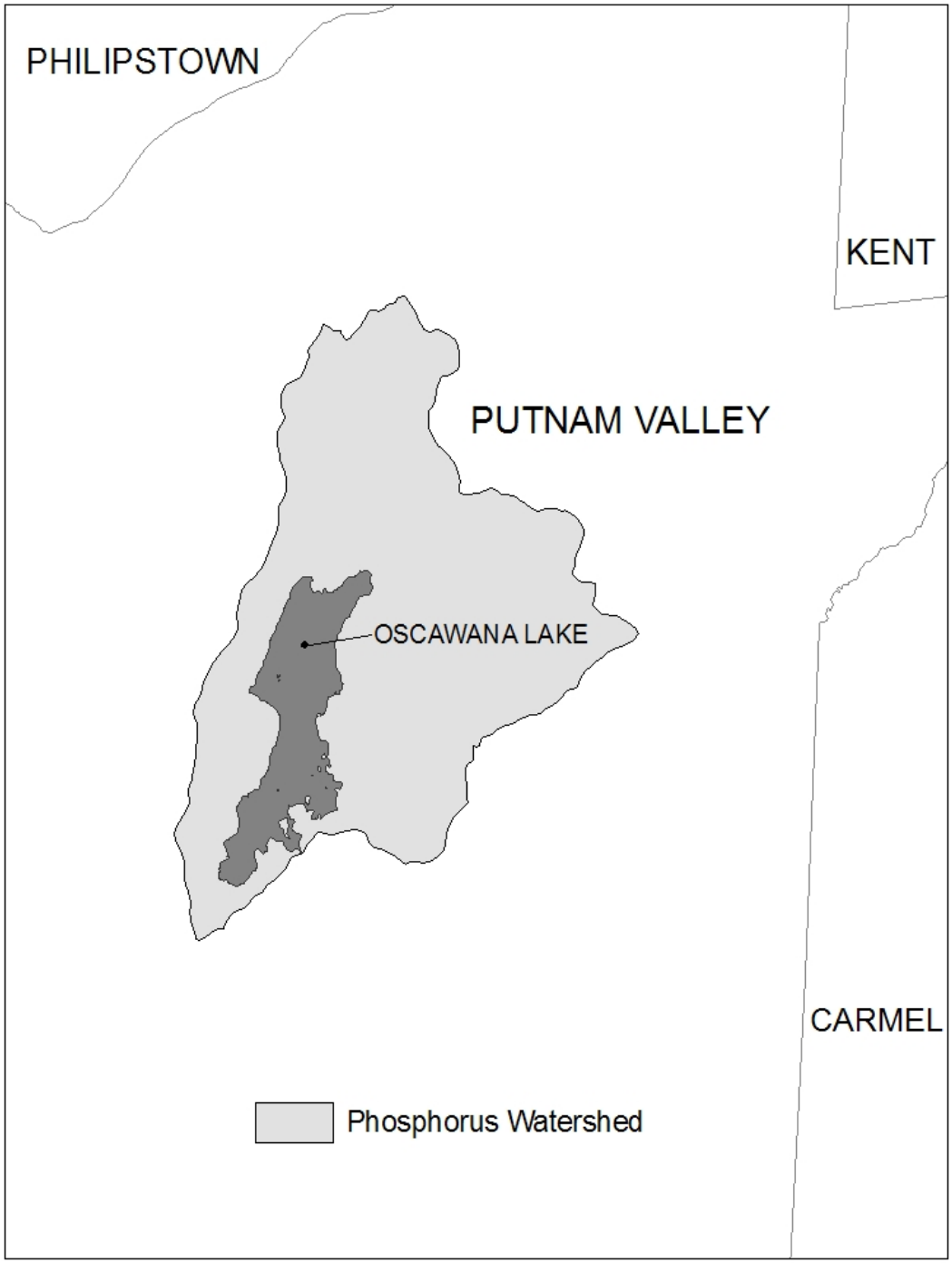
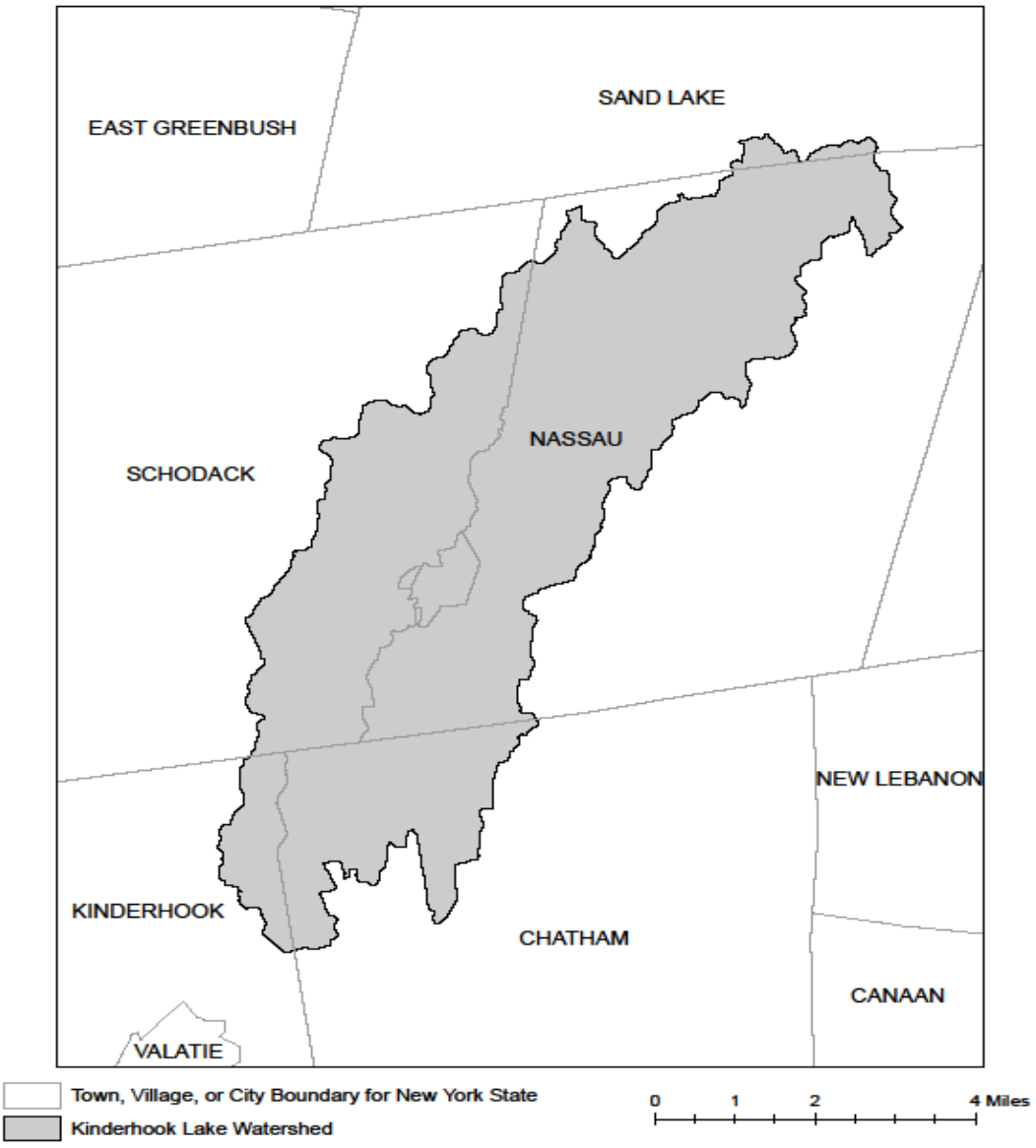


Figure 5: Kinderhook Lake Watershed



XI. APPENDIX D

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River **-** See Figure 1 in Appendix C

XII. APPENDIX E

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond
Albany	Basic Creek Reservoir
Allegheny	Amity Lake, Saunders Pond
Bronx	Van Cortlandt Lake
Broome	Whitney Point Lake/Reservoir
Broome	Fly Pond, Deer Lake
Broome	Minor Tribs to Lower Susquehanna (north)
Cattaraugus	Allegheny River/Reservoir
Cattaraugus	Case Lake
Cattaraugus	Linlyco/Club Pond
Cayuga	Duck Lake
Chautauqua	Chautauqua Lake, North
Chautauqua	Chautauqua Lake, South
Chautauqua	Bear Lake
Chautauqua	Chadakoin River and tribs
Chautauqua	Lower Cassadaga Lake
Chautauqua	Middle Cassadaga Lake
Chautauqua	Findley Lake
Clinton	Great Chazy River, Lower, Main Stem
Columbia	Kinderhook Lake
Columbia	Robinson Pond
Dutchess	Hillside Lake
Dutchess	Wappinger Lakes
Dutchess	Fall Kill and tribs
Erie	Green Lake
Erie	Scajaquada Creek, Lower, and tribs
Erie	Scajaquada Creek, Middle, and tribs
Erie	Scajaquada Creek, Upper, and tribs
Erie	Rush Creek and tribs
Erie	Ellicott Creek, Lower, and tribs
Erie	Beeman Creek and tribs
Erie	Murder Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs
Erie	Little Sister Creek, Lower, and tribs
Essex	Lake George (primary county: Warren)
Genesee	Black Creek, Upper, and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem
Genesee	Oak Orchard Creek, Upper, and tribs
Genesee	Bowen Brook and tribs
Genesee	Bigelow Creek and tribs
Genesee	Black Creek, Middle, and minor tribs
Genesee	LeRoy Reservoir
Greene	Schoharie Reservoir
Greene	Sleepy Hollow Lake
Herkimer	Steele Creek tribs
Kings	Hendrix Creek
Lewis	Mill Creek/South Branch and tribs
Livingston	Conesus Lake
Livingston	Jaycox Creek and tribs
Livingston	Mill Creek and minor tribs
Livingston	Bradner Creek and tribs
Livingston	Christie Creek and tribs
Monroe	Lake Ontario Shoreline, Western
Monroe	Mill Creek/Blue Pond Outlet and tribs
Monroe	Rochester Embayment - East
Monroe	Rochester Embayment - West
Monroe	Unnamed Trib to Honeoye Creek
Monroe	Genesee River, Lower, Main Stem
Monroe	Genesee River, Middle, Main Stem
Monroe	Black Creek, Lower, and minor tribs
Monroe	Buck Pond
Monroe	Long Pond
Monroe	Cranberry Pond
Monroe	Mill Creek and tribs
Monroe	Shipbuilders Creek and tribs
Monroe	Minor tribs to Irondequoit Bay
Monroe	Thomas Creek/White Brook and tribs
Nassau	Glen Cove Creek, Lower, and tribs
Nassau	LI Tribs (fresh) to East Bay
Nassau	East Meadow Brook, Upper, and tribs
Nassau	Hempstead Bay
Nassau	Hempstead Lake
Nassau	Grant Park Pond
Nassau	Beaver Lake
Nassau	Camaans Pond
Nassau	Halls Pond
Nassau	LI Tidal Tribs to Hempstead Bay
Nassau	Massapequa Creek and tribs
Nassau	Reynolds Channel, east
Nassau	Reynolds Channel, west
Nassau	Silver Lake, Lofts Pond
Nassau	Woodmere Channel
Niagara	Hyde Park Lake
Niagara	Lake Ontario Shoreline, Western
Niagara	Bergholtz Creek and tribs
Oneida	Ballou, Nail Creeks
Onondaga	Ley Creek and tribs
Onondaga	Onondaga Creek, Lower and tribs

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Onondaga	Onondaga Creek, Middle and tribs	Suffolk	Great South Bay, West
Onondaga	Onondaga Creek, Upp, and minor tribs	Suffolk	Mill and Seven Ponds
Onondaga	Harbor Brook, Lower, and tribs	Suffolk	Moriches Bay, East
Onondaga	Ninemile Creek, Lower, and tribs	Suffolk	Moriches Bay, West
Onondaga	Minor tribs to Onondaga Lake	Suffolk	Quantuck Bay
Onondaga	Onondaga Creek, Lower, and tribs	Suffolk	Shinnecock Bay (and Inlet)
Ontario	Honeoye Lake	Sullivan	Bodine, Montgomery Lakes
Ontario	Hemlock Lake Outlet and minor tribs	Sullivan	Davies Lake
Ontario	Great Brook and minor tribs	Sullivan	Pleasure Lake
Orange	Monhagen Brook and tribs	Sullivan	Swan Lake
Orange	Orange Lake	Tompkins	Cayuga Lake, Southern End
Orleans	Lake Ontario Shoreline, Western	Tompkins	Owasco Inlet, Upper, and tribs
Oswego	Pleasant Lake	Ulster	Ashokan Reservoir
Oswego	Lake Neatahwanta	Ulster	Esopus Creek, Upper, and minor tribs
Putnam	Oscawana Lake		
Putnam	Palmer Lake	Ulster	Esopus Creek, Lower, Main Stem
Putnam	Lake Carmel	Ulster	Esopus Creek, Middle, and minor tribs
Queens	Jamaica Bay, Eastern, and tribs (Queens)		
Queens	Bergen Basin	Warren	Lake George
Queens	Shellbank Basin	Warren	Tribs to L.George, Village of L George
Rensselaer	Nassau Lake		
Rensselaer	Snyders Lake	Warren	Huddle/Finkle Brooks and tribs
Richmond	Grasmere, Arbutus and Wolfes Lakes	Warren	Indian Brook and tribs
Rockland	Congers Lake, Swartout Lake	Warren	Hague Brook and tribs
Rockland	Rockland Lake	Washington	Tribs to L.George, East Shr Lk George
Saratoga	Ballston Lake		
Saratoga	Round Lake	Washington	Cossayuna Lake
Saratoga	Dwaas Kill and tribs	Washington	Wood Cr/Champlain Canal, minor tribs
Saratoga	Tribs to Lake Lonely		
Saratoga	Lake Lonely	Wayne	Port Bay
Schenectady	Collins Lake	Wayne	Marbletown Creek and tribs
Schenectady	Duane Lake	Westchester	Lake Katonah
Schenectady	Mariaville Lake	Westchester	Lake Mohegan
Schoharie	Engleville Pond	Westchester	Lake Shenorock
Schoharie	Summit Lake	Westchester	Reservoir No.1 (Lake Isle)
Schuyler	Cayuta Lake	Westchester	Saw Mill River, Middle, and tribs
St. Lawrence	Fish Creek and minor tribs	Westchester	Silver Lake
St. Lawrence	Black Lake Outlet/Black Lake	Westchester	Teatown Lake
Steuben	Lake Salubria	Westchester	Truesdale Lake
Steuben	Smith Pond	Westchester	Wallace Pond
Suffolk	Millers Pond	Westchester	Peach Lake
Suffolk	Mattituck (Marratooka) Pond	Westchester	Mamaroneck River, Lower
Suffolk	Tidal tribs to West Moriches Bay	Westchester	Mamaroneck River, Upp, and tribs
Suffolk	Canaan Lake	Westchester	Sheldrake River and tribs
Suffolk	Lake Ronkonkoma	Westchester	Blind Brook, Lower
Suffolk	Beaverdam Creek and tribs	Westchester	Blind Brook, Upper, and tribs
Suffolk	Big/Little Fresh Ponds	Westchester	Lake Lincolndale
Suffolk	Fresh Pond	Westchester	Lake Meahaugh
Suffolk	Great South Bay, East	Wyoming	Java Lake
Suffolk	Great South Bay, Middle	Wyoming	Silver Lake

Note: The list above identifies those waters from the final New York State "2014 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated January 2015, that are impaired by silt, sediment or nutrients.

XIII. APPENDIX F

LIST OF NYS DEC REGIONAL OFFICES

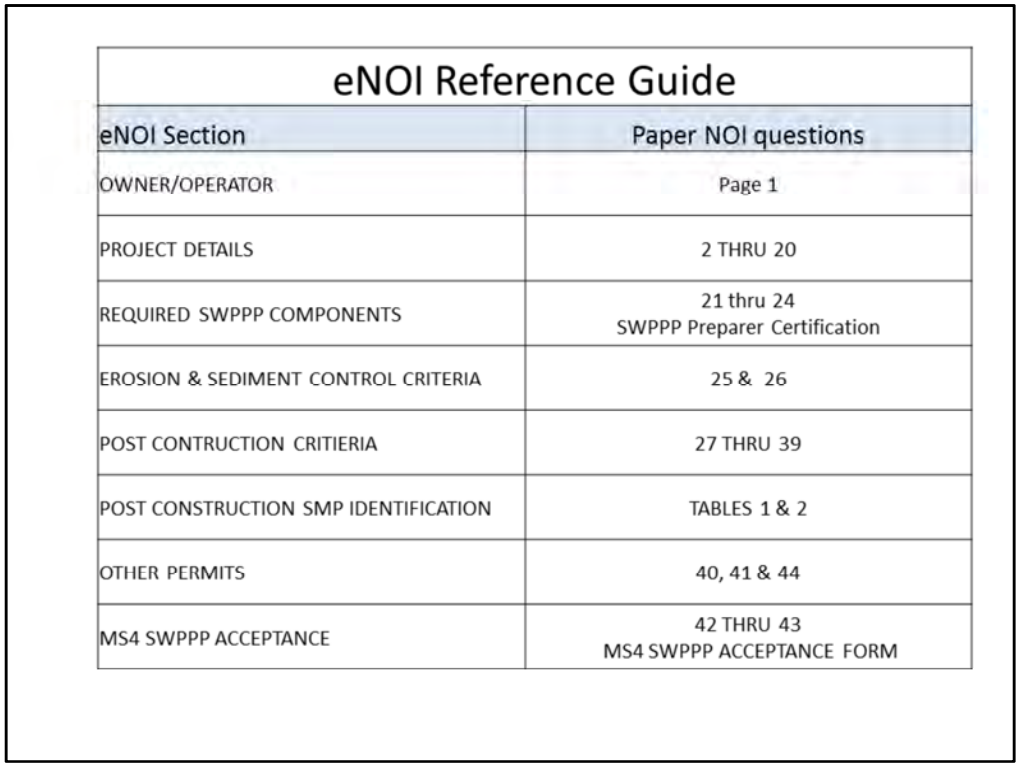
Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD WARRENSBURG, NY 12885-1172 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

NYS DEC's New Electronic Notice of Intent (eNOI) for Stormwater Discharges from Construction Activity

The New York State Department of Environmental Conservation (NYSDEC) is now allowing owners/operators of construction activities to electronically complete and file their Notice of Intent (eNOI) for coverage under the SPDES General Permit for Stormwater Associated with Construction Activity (CGP). NYSDEC will be accepting both paper and electronic submissions.

This system has been developed in advance of EPA rule making that proposes NPDES regulated entities electronically submit permit and compliance monitoring instead of paper reports. Once finalized, the EPA reporting rule will require Notices of Intent to discharge in compliance with a general permit to be filed electronically.

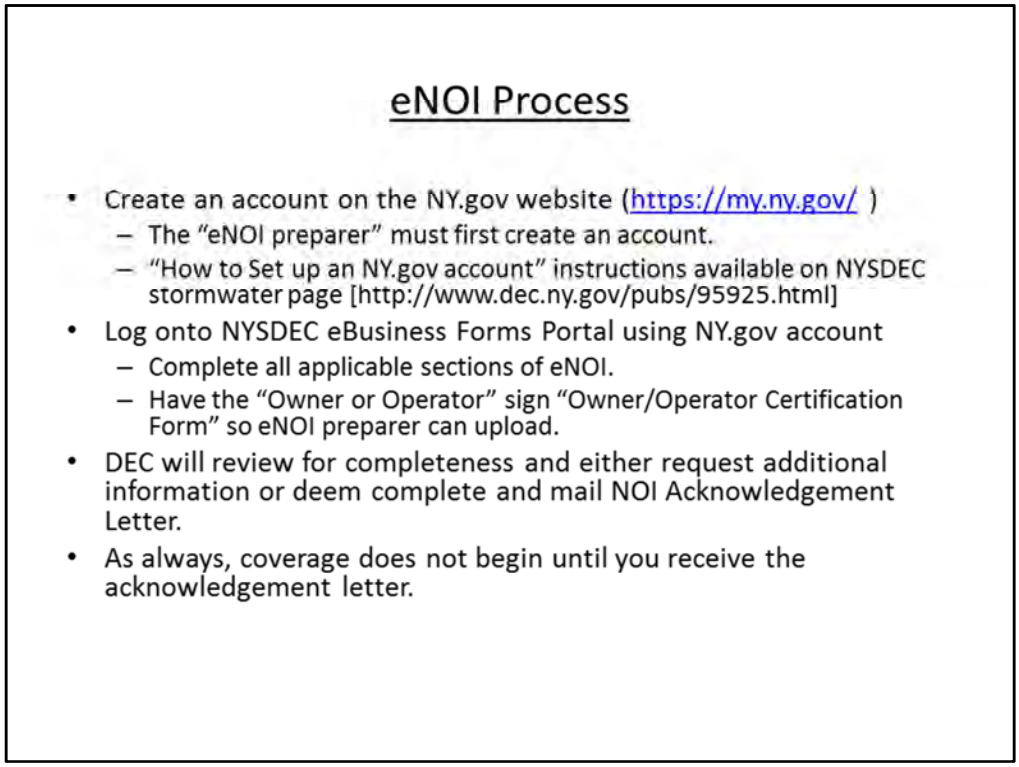
Owners/Operators are encouraged to begin using the eNOI to allow NYSDEC to optimize the program before it becomes mandatory.



eNOI Reference Guide

eNOI Section	Paper NOI questions
OWNER/OPERATOR	Page 1
PROJECT DETAILS	2 THRU 20
REQUIRED SWPPP COMPONENTS	21 thru 24 SWPPP Preparer Certification
EROSION & SEDIMENT CONTROL CRITERIA	25 & 26
POST CONTRUCTION CRITIERIA	27 THRU 39
POST CONSTRUCTION SMP IDENTIFICATION	TABLES 1 & 2
OTHER PERMITS	40, 41 & 44
MS4 SWPPP ACCEPTANCE	42 THRU 43 MS4 SWPPP ACCEPTANCE FORM

The eNOI contains the same questions as the paper version in a slightly different format. The eNOI breaks up the questions into smaller, manageable sections so that the form is easier to navigate. The eNOI Reference Guide provides a cross reference of the eNOI with the Paper NOI questions.



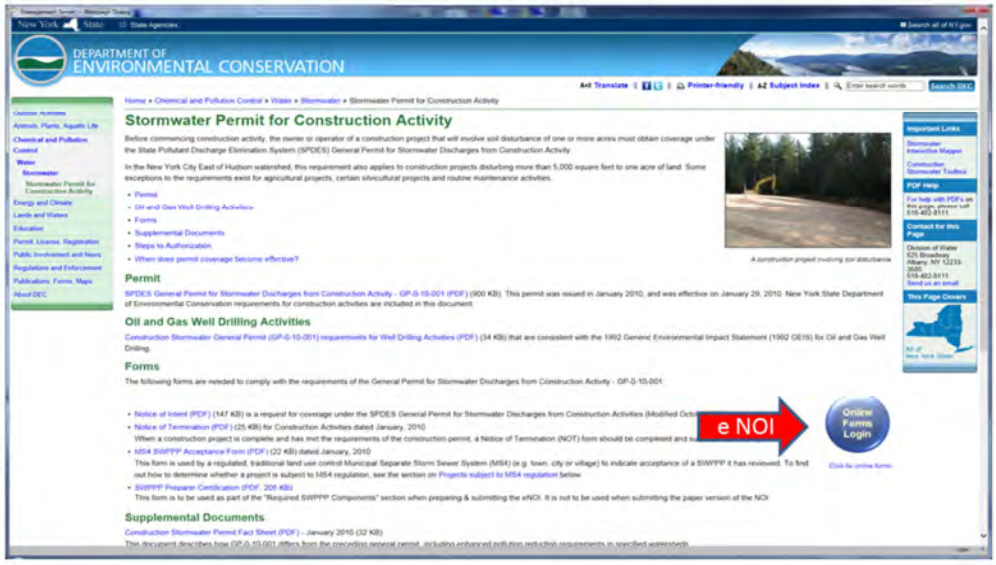
These instructions will assist with navigation through the eNOI process. Information is provided on each of the steps to allow successful submission of the eNOI as well as what to expect in responses from NYSDEC.

The eNOI preparer must have an NY.gov account. The NY.gov account represents the preparer's electronic signature. If you already have an NY.gov account, you do not need to create a new account. However, if you forget your user name or password this is where you would go to find your username or reset your password.

Separate instructions for registering and activating an NY.gov account are available on the stormwater webpage:
http://www.dec.ny.gov/chemical/43133.html.

Accessing NYSDEC eBusiness Forms Portal

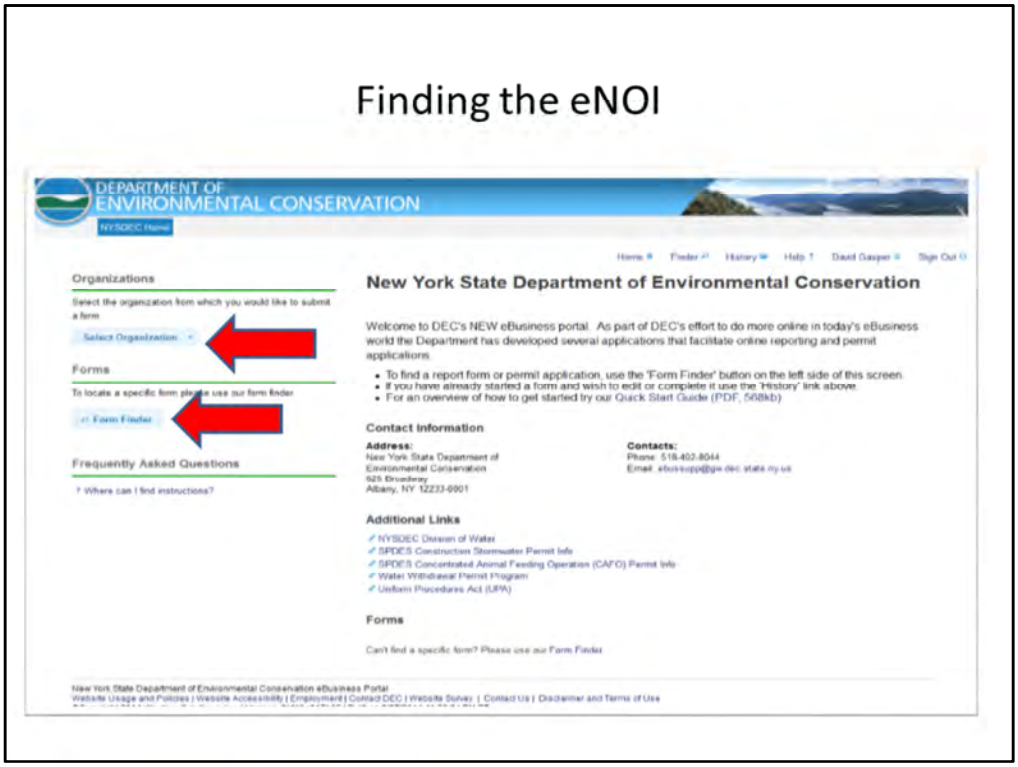
http://www.dec.ny.gov/chemical/43133.html



To access the eNOI, go to the NYSDEC eBusiness Forms Portal. A link to this portal can be found on the NYSDEC stormwater webpage (http://www.dec.ny.gov/chemical/43133.html). When you click on the "On-Line Forms Login" button, you will be directed to the NY.gov log in.

Log in using the user name and password for your NY.gov account. This will take you to the NYSDEC eBusiness main page.

Finding the eNOI

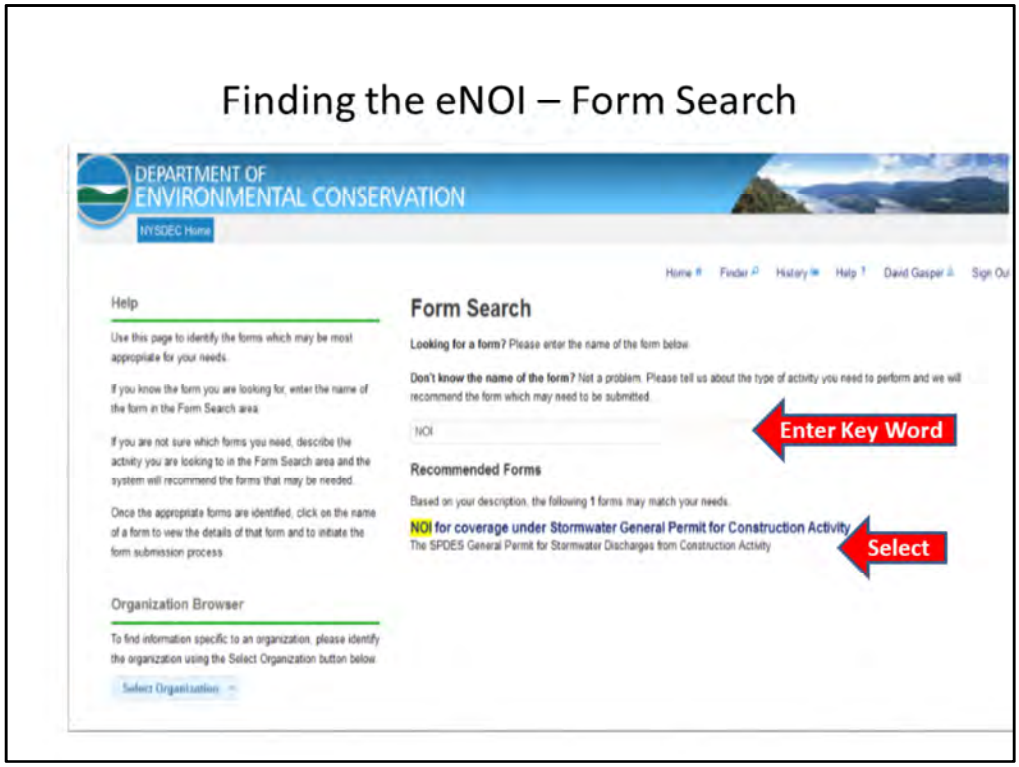


There are two methods for finding the form you need to complete on the NYSDEC eBusiness Forms Portal (http://www.dec.ny.gov/chemical/43133.html):

1. Select an Organization to navigate to the list of forms, and
2. Form Finder.

Select an Organization

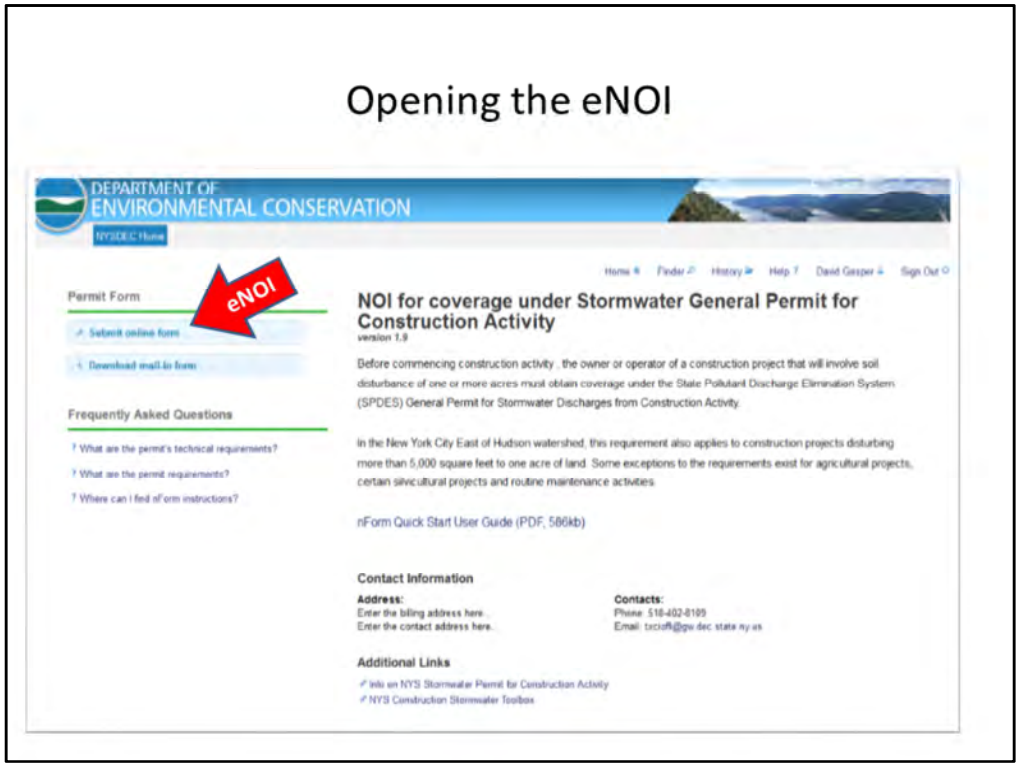
1. Click on the Select Organization button.
2. Mouse over the organization list and click on Division of Water (DOW).
3. After selecting DOW, the details for the division will be displayed as well as all forms related to DOW.
4. Choose “NOI for Coverage under Stormwater General Permit for Construction Activity”.



Form Finder

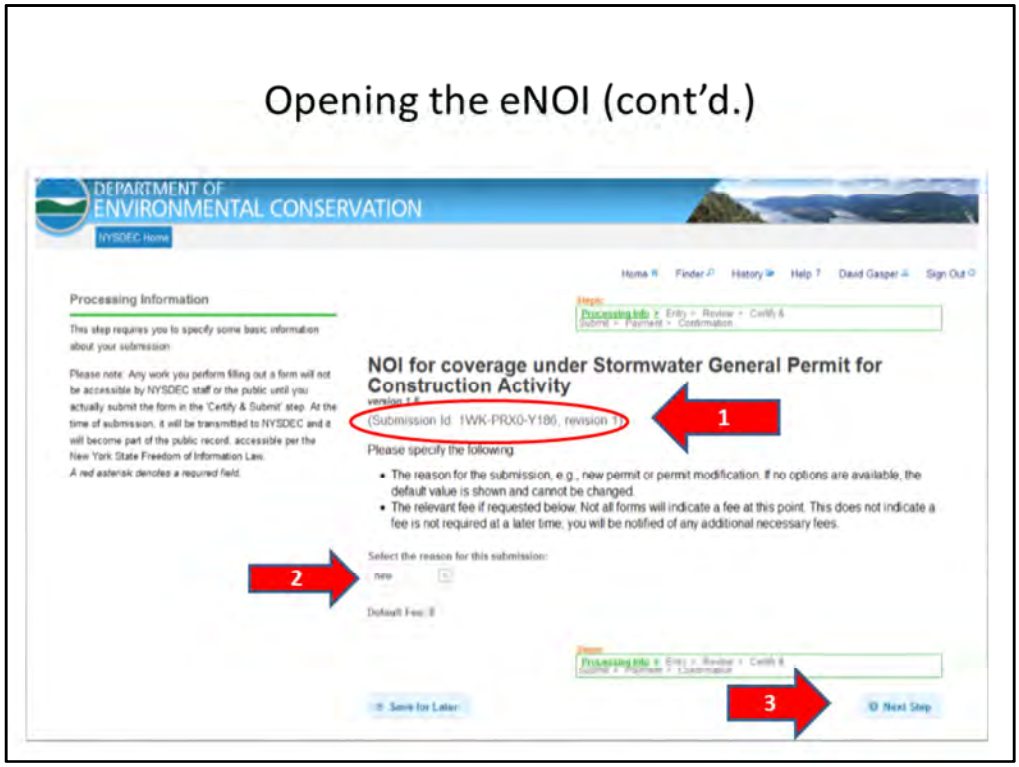
The Form Finder tool allows you to search for a specific keyword, e.g., NOI, construction, stormwater. Enter the key word to search. Then choose "NOI for Coverage under Stormwater General Permit for Construction Activity" from the list of recommended forms.

This will bring you to the eNOI main page.



Once you have found and clicked on the eNOI, the “NOI for coverage under Stormwater General Permit for Construction Activity” main page will appear. The main page provides information about the permit, links to frequently asked questions, contact information, and, in the top left of the page, buttons to either submit the form online, or to download a paper version to manually enter the data and mail to NYSDEC.

Click on the “Submit online form” button to access the eNOI.



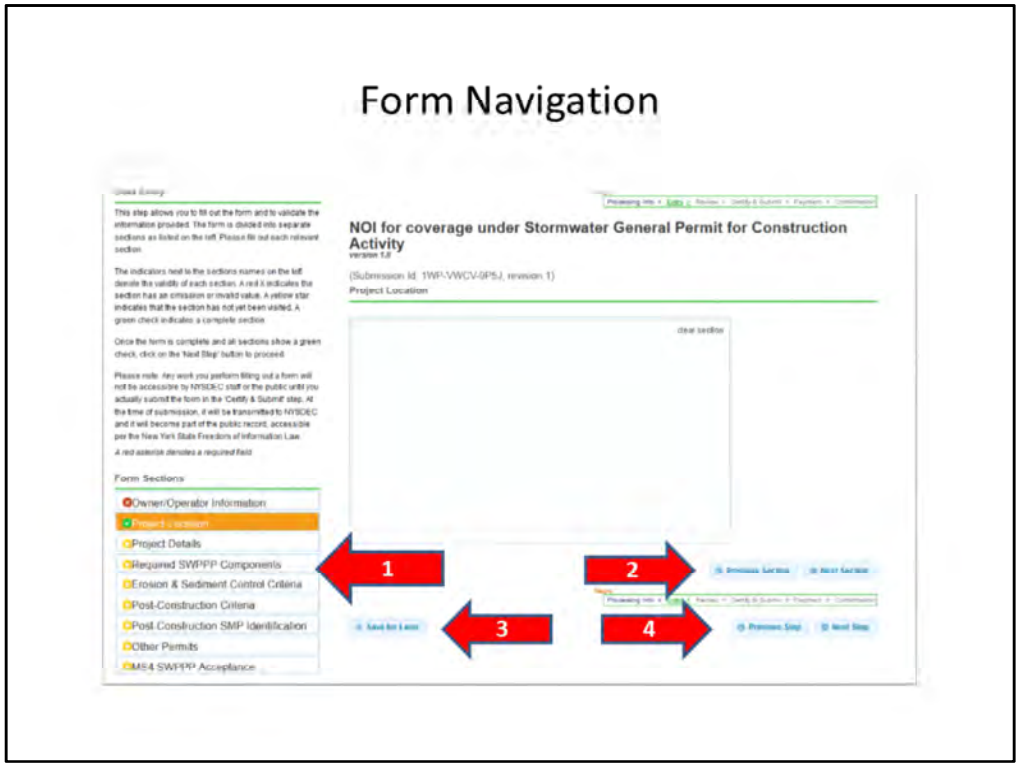
When you click on the "Submit online form" button, an eNOI record will be created and a submission identification number will be assigned (Arrow 1).

Key Point/Important Reminders:

1. **<u>Be sure to make a note of your Submission ID #.</u>** This is the only way DEC can track your submission. If any changes are made to the data after the form is first submitted, the Submission ID # will remain the same.

2. Note: Reason for submission will always default to "new". This cannot be changed by the preparer.

3. Click "Next Step" to continue to the data entry pages.



There are certain key features that are used to navigate through the eNOI:

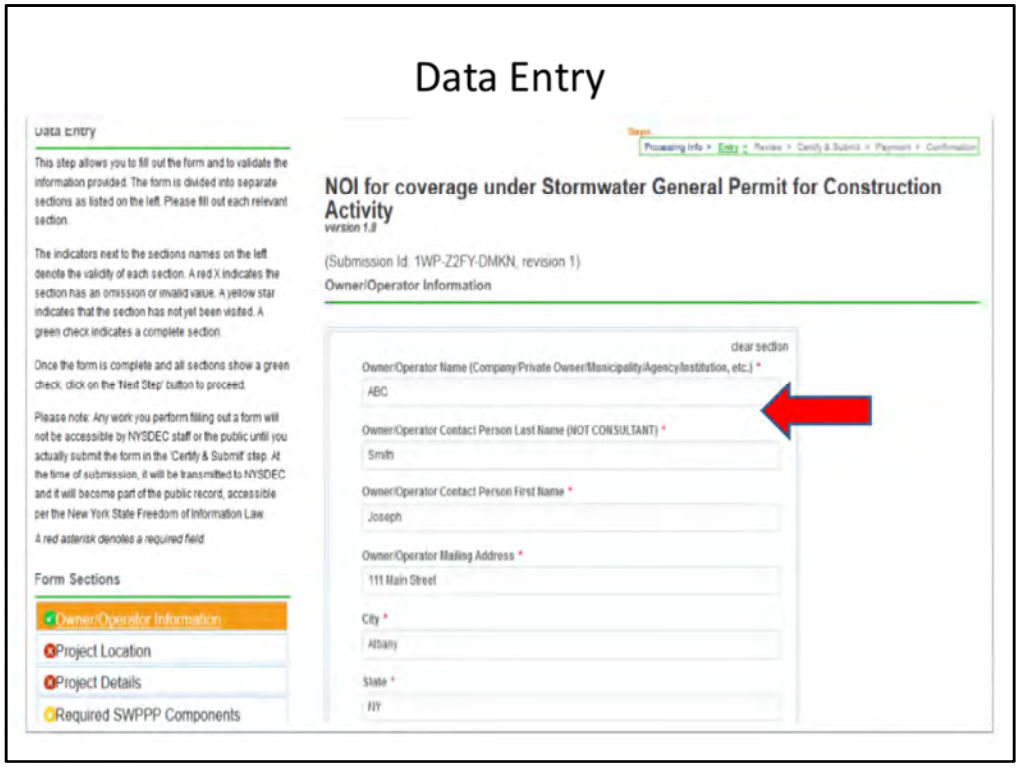
1. **Form Sections**: The eNOI has multiple sections so that the form is easier to navigate *(see page 2 for eNOI Reference Guide for a cross reference of the eNOI with the Paper NOI questions)*. Each section is preceded by an icon that indicates the form status:
   - ❖ Yellow = This section has not been viewed
   - ❖ Red = All required data has not been entered in this section.
   - ❖ Green = This section has been visited and all required data has been entered.

2. **Previous/Next Section** navigates the form sections. All sections must be viewed prior to form submission.

3. **Save for Later** can be used to save your data entries, leave the eNOI, and return at a later time to complete the form. Each submission can be saved at any time during the data entry stage to be continued or completed later.

4. **Previous/Next Step** moves the user through the steps (Processing Info, Entry, Review, Certify & Submit, Payment**, Confirmation) for completing and submitting the form. All form sections must be visited and all required data entered before you can move to the next step.

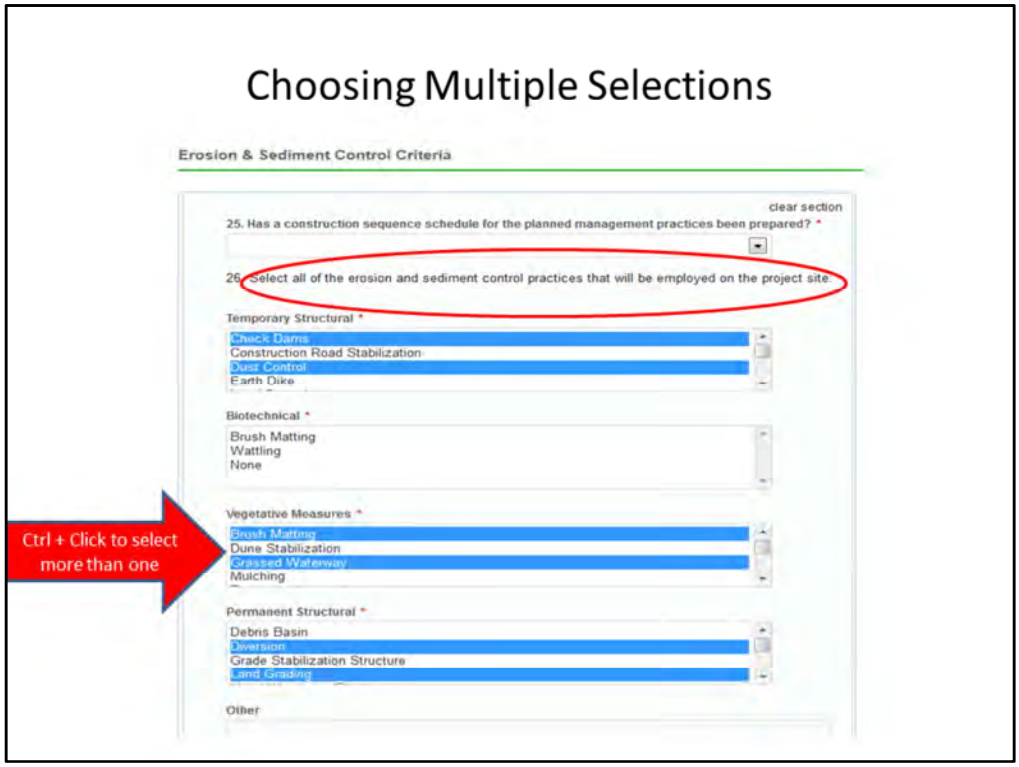
**Note: Please note that some forms may include a payment step. However, with the eNOI, there are no fees associated with submitting the NOI. Projects will continue to be billed separately for the initial authorization and annual fees.



The questions on the eNOI are generally the same as on the current version of the paper NOI (see page 2 for eNOI reference guide). Answer all applicable questions, as indicated. The red asterisk indicates fields that are required to be completed for all projects. If all required fields are not completed, you will not be able to submit the form to NYSDEC.

Please note, that there are questions that are not required for all projects. Be careful to answer all questions applicable to your project to avoid having the NOI returned as incomplete and delays in obtaining coverage.

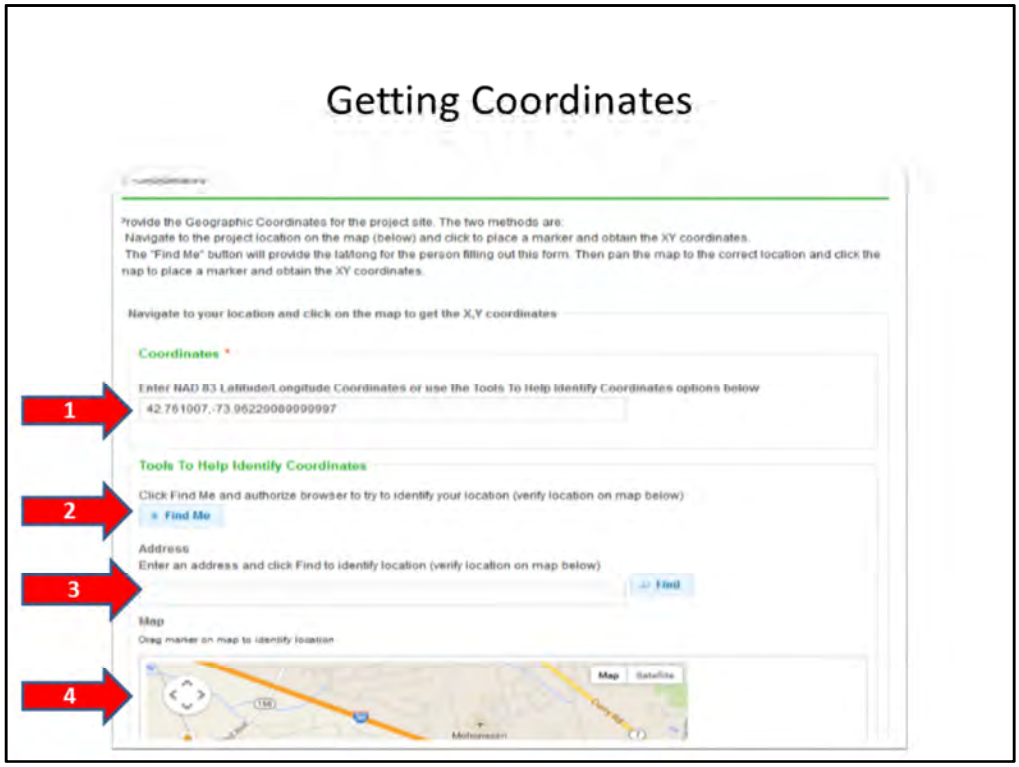
While most of the questions on the eNOI are self explanatory, there are some unique features associated with the eNOI that will be discussed further.



The NOI has several questions that may require you to identify more than one selection. For example:

Questions 9a and 9b in the Project Details Section requires you to identify the type of water bodies to which the project will discharge;
Question 26 in the Erosion and Sediment Control Criteria Section requires you to select all erosion and sediment control practices that will be employed;
Question 27 in the Post-Construction Criteria Section requires you to identify all site planning practices that were used; and
Question 40 in the Other Permits Section requires you to identify all other DEC permits, existing and new, that are required for the project.

To choose multiple selections in a field, control + click on each selection.



The eNOI provides four methods for obtaining the coordinates for your project site:

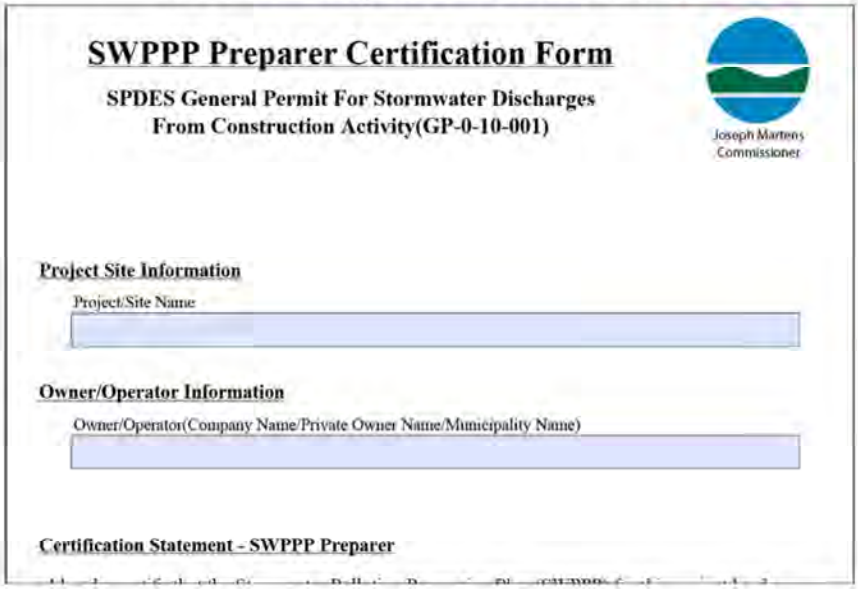
1. Directly enter the Latitude/Longitude Coordinates. **Note: The paper NOI requested information to be entered using UTM. The eNOI requires coordinates to be entered using decimal degrees.**

2. The "Find Me" button will provide the lat/long for the person filling out this form. Then pan the map to the correct location and click the map to place a marker and obtain the XY coordinates; or,

3. Enter the address of the project and click find. This function will only work for legally recognized addresses; or

4. Navigate to the project location on the map and click to place a marker and obtain the XY coordinates.

SWPPP Preparer Certification



SWPPP Preparer Certification Form

SPDES General Permit For Stormwater Discharges From Construction Activity(GP-0-10-001)

Joseph Martens
Commissioner

Project Site Information

Project/Site Name

Owner/Operator Information

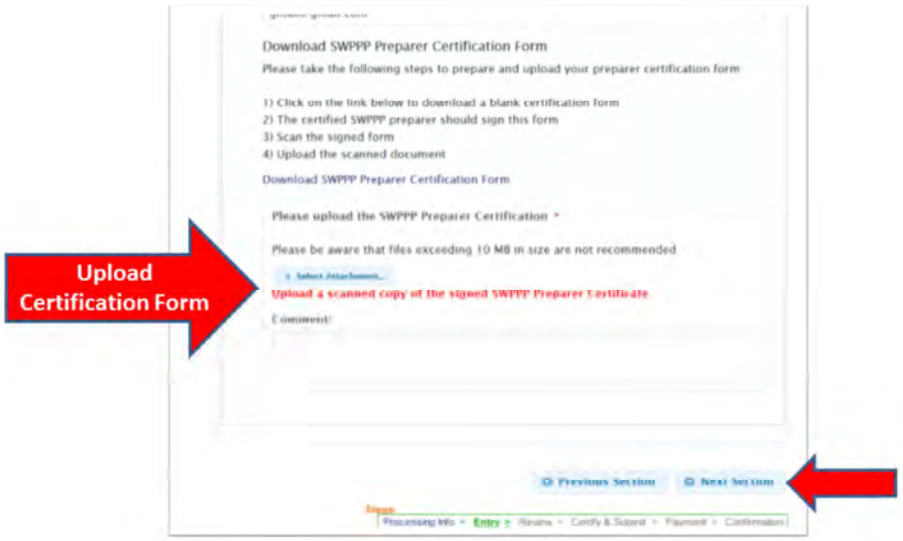
Owner/Operator(Company Name/Private Owner Name/Municipality Name)

Certification Statement - SWPPP Preparer

In order to be complete, the NOI must include a signed certification by the SWPPP preparer. The "SWPPP Preparer Certification" certifies that a SWPPP has been developed for the specific project and has been prepared in accordance with the terms and conditions of GP-0-10-001. This requires a separate certification for each project.

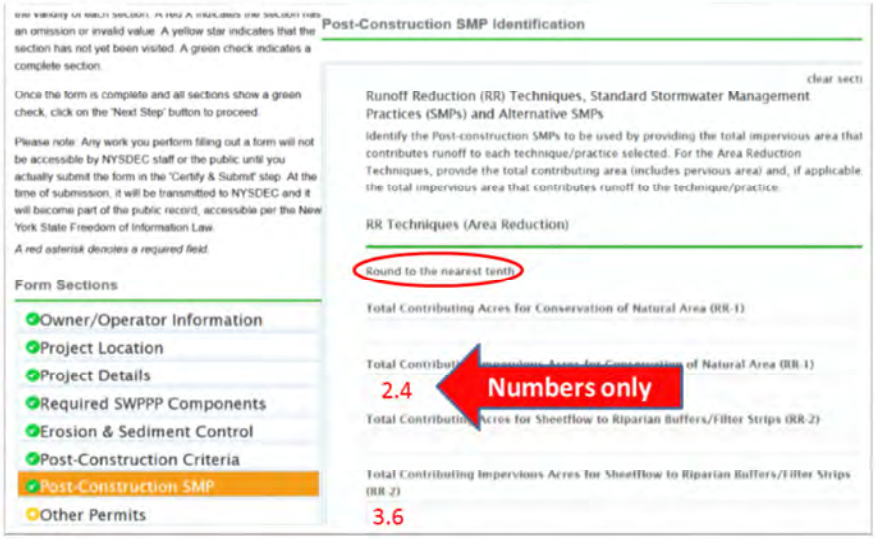
Since the eNOI only allows for one electronic signature, the eNOI will require that you attach a scanned version of the "SWPPP Preparer Certification." This certification can be down loaded from the eNOI in the "Required SWPPP Components" Section(see next page) or from the construction stormwater webpage under Forms: http://www.dec.ny.gov/chemical/43133.html. The certification must be completed, printed and signed and then saved electronically for upload to the form.

Required SWPPP Components Section
SWPPP Preparer Certification



Upload the signed “SWPPP Preparer Certification” using the “Select Attachment” button.

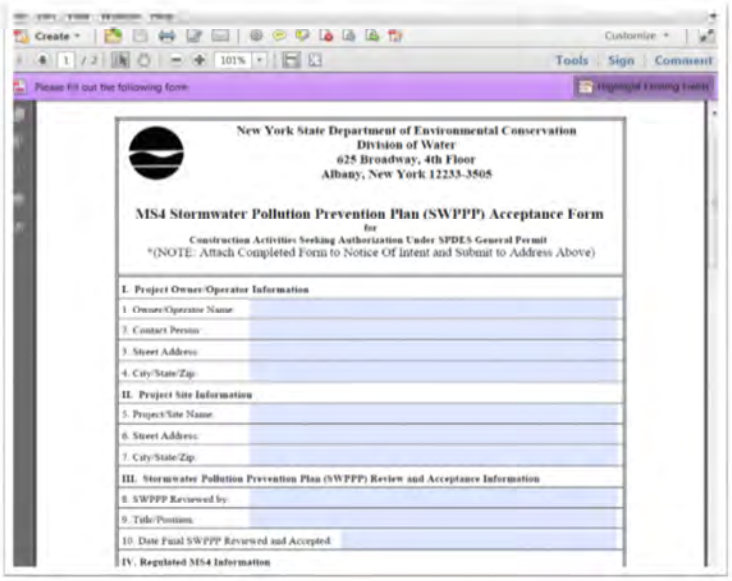
Post-Construction SMP Identification Section Key Points/Important Reminders



Please note, that not all projects require post construction practices. Therefore, these questions are not marked as required. However, if your project requires post construction practices, please make sure you answer all questions in the Sections titled "Post-Construction Criteria" & "Post-Construction SMP Identification Sections". Failure to complete these questions for projects that require post construction controls will result in the NOI being returned as incomplete and may result in delays in obtaining coverage.

The Post-construction SMP contains the same information contained in Tables 1 & 2 of the paper NOI form. Identify the Post-construction SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice. Provide area in acres and round to the nearest tenth.

MS4 SWPPP Acceptance Form



New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

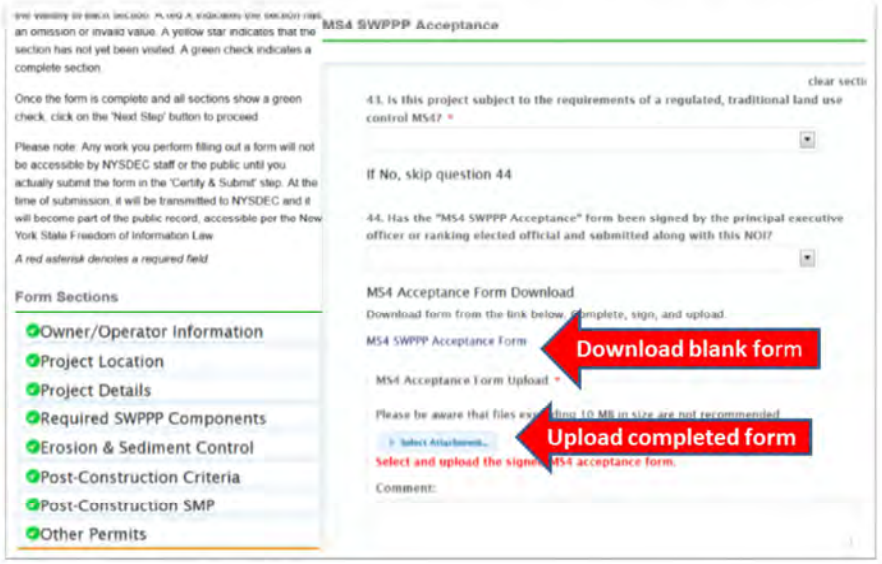
MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form
for
Construction Activities Seeking Authorization Under SPDES General Permit
*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information

If the project is subject to the requirements of a regulated, traditional land use control MS4, you must attach a completed MS4 Acceptance Form that has been signed by the principal executive officer or ranking elected official from the regulated, traditional land use control MS4.

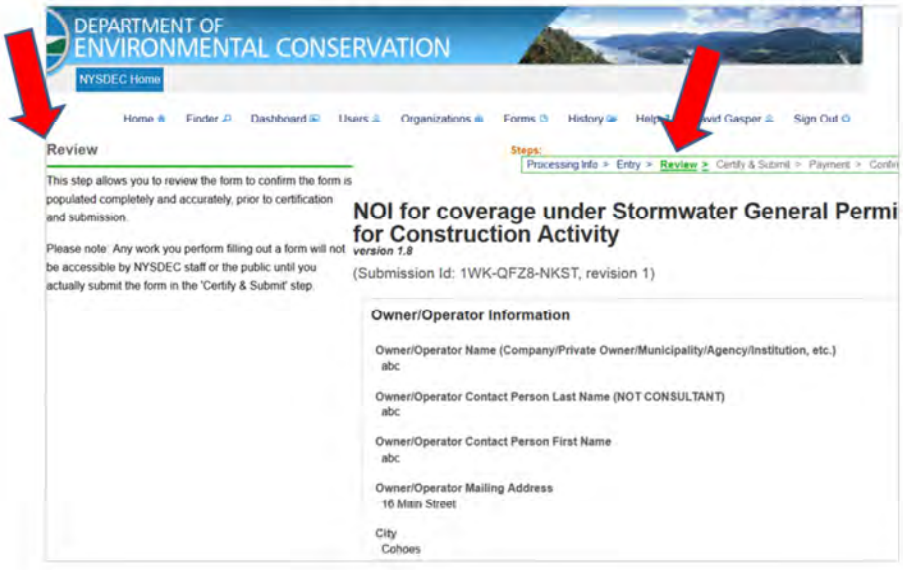
Since the eNOI can only accept one electronic signature, the eNOI will require you to attach a scanned version of the completed & signed MS4 certification. This certification can be down loaded directly from the eNOI (see next page) or from the construction stormwater webpage under Forms: http://www.dec.ny.gov/chemical/43133.html. The certification must be completed, printed and signed and then saved electronically for upload to the form.

MS4 SWPPP Acceptance Section
Key Points/Important Reminders



The eNOI will allow you to attach a scanned version of the completed & signed certification. This certification can be down loaded directly from the eNOI or from the construction stormwater webpage under Forms:
http://www.dec.ny.gov/chemical/43133.html

Checking Accuracy/Completeness of Information Provided in eNOI

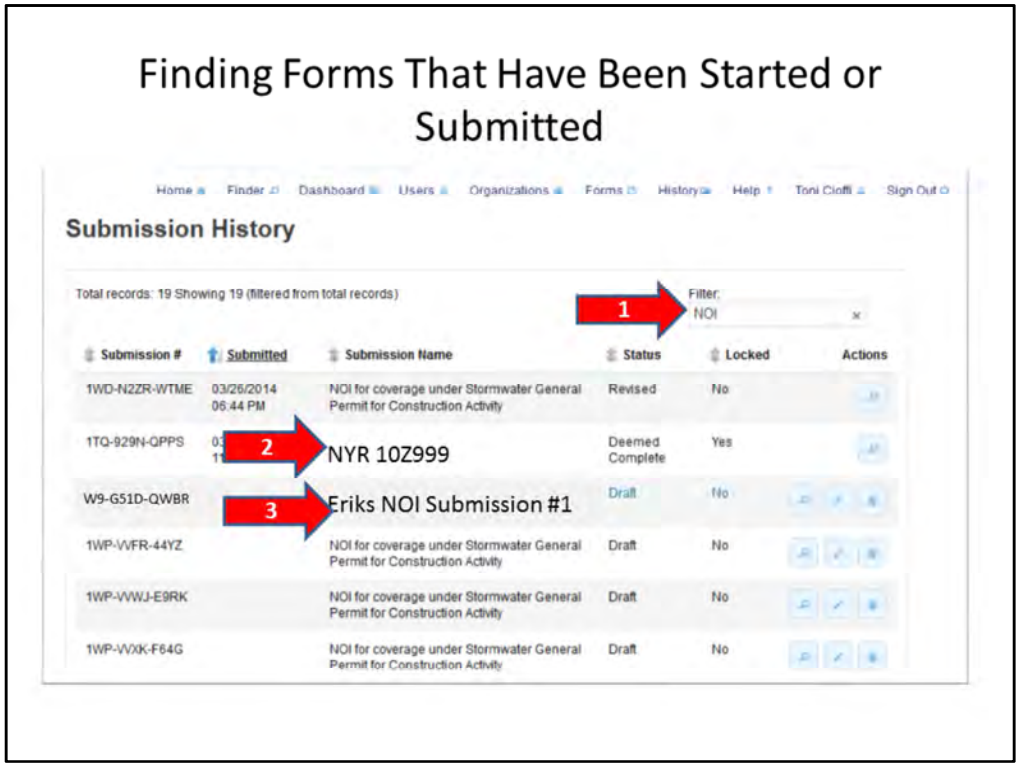


Once all data has been entered and all sections are complete, you may move to the Review Step. This step provides the user a chance to review the information that was entered prior to submission of the form. All of the form questions and answers will be displayed on this screen.

If the eNOI is determined to be complete, you may move to the “Certify & Submit” step, read the certification statement and submit the form. Clicking the submit button is deemed the equivalent of signing a paper copy of the form. In the future, EPA requirements for electronic reporting may require a more involved certification process that includes re-entering the user password and correctly answering a predefined challenge question.

Finding forms that have been Started or Submitted

If an NOI was saved for later, you may access the submission by using the “History” link at the NYSDEC eBusiness Portal (http://www.dec.ny.gov/chemical/43133.html). This will provide access to the “Submission History” page that will display all of the forms that the user has access to, and their status.

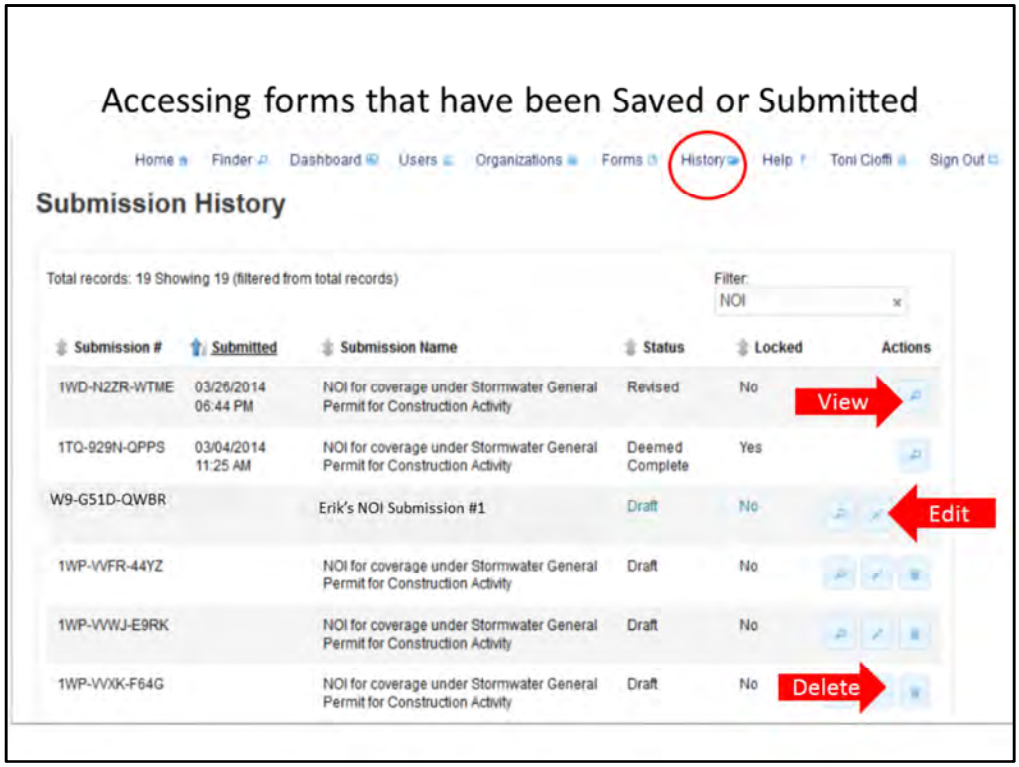


The “Submission History” page can be filtered to narrow down the number of records (see Arrow 1). You can filter on keywords, dates or submission numbers listed in the table.

Below are some key things that will help identify/locate the submission:

Submission # is the unique identification number that was assigned to the eNOI when it was created.
Submitted – the date shown is the date the form was submitted to DEC. DEC cannot see forms prior to submission.
Submission Name - Each entry in the History table is given a default Submission Name that is the same as the form name. This name can be edited in order to provide a more meaningful name to the submission (e.g. Erik’s NOI Submission #1)(Arrow 3). To rename the submission, click on the Submission Name, which will make the name ready to edit, and enter the new name. For projects that receive permit coverage, it is recommended that the permit number be saved as part of the submission name in the event that the NOI needs to be revised once permit coverage is granted (Arrow 3).
Submission Status

“Draft” = form has been started by not yet submitted. DEC cannot see these forms
“Submitted” = Form has been submitted to DEC for review but DEC has not deemed it complete.
“Deemed complete” = DEC has reviewed the form and has deemed it complete
“Revised” = Form was previously submitted to DEC but has been revised from the original submission.



There are three possible actions that can be performed to an existing form from the "Submission History" page:

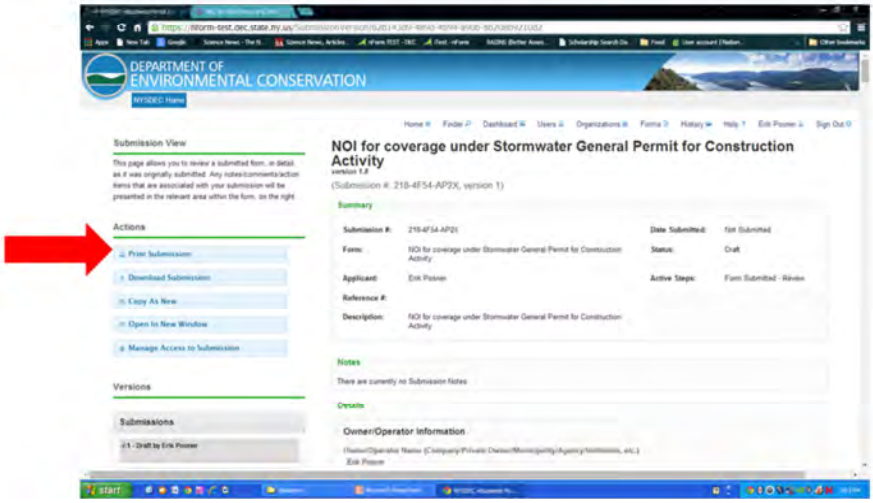
➢ View – can always be performed, regardless of the form status. This displays all of the form questions and responses, but does not allow data to be modified. In the View Form mode, users can also print or download the submission and perform post-submission actions (as described on page 32).

➢ Edit – Forms can only be edited before they are submitted. This is not to be confused with revising a submission, which will be covered later in this document. This command is used to continue working on a saved form. Data already entered in the form can also be changed or deleted.

➢ Delete – Forms can only be deleted before they are submitted. Once submitted, a form's data becomes a permanent record. *Once deleted, recovery is not possible.*

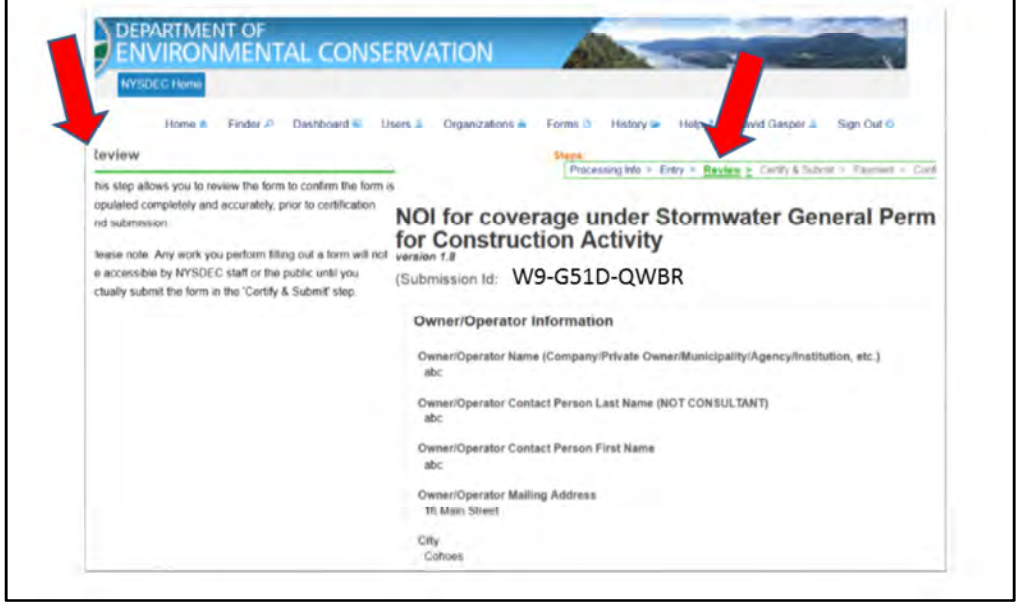
In order to review, certify and submit the NOI, the owner/operator must select the edit button.

Printing, Copying etc…

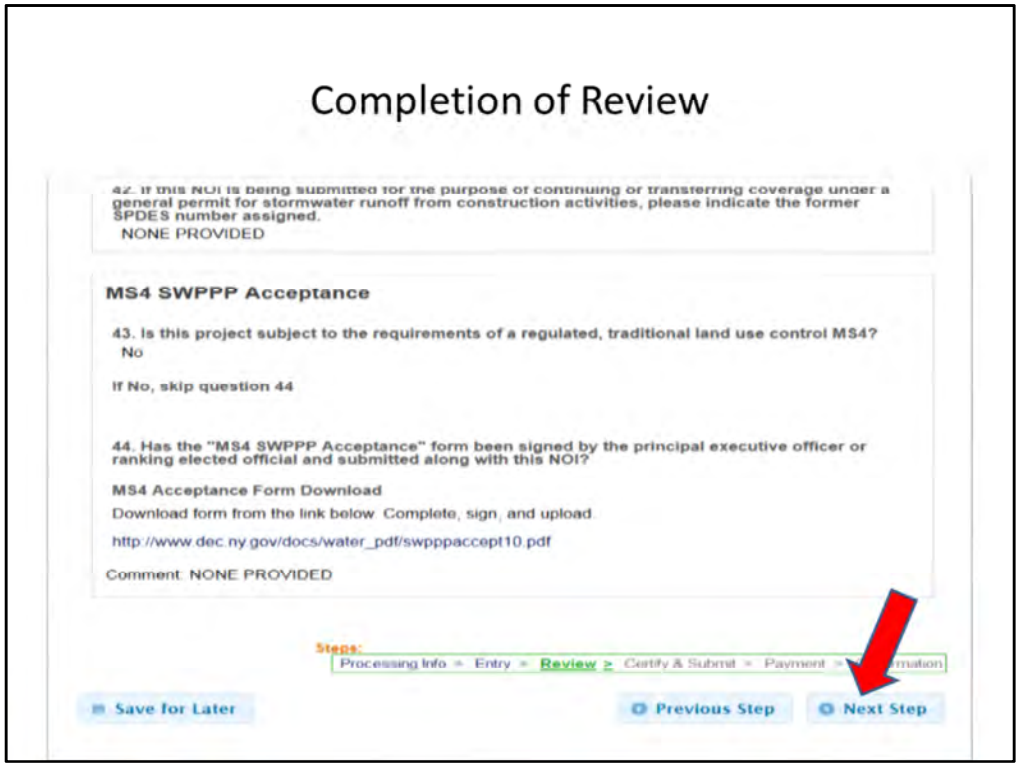


By clicking on the “View” icon on the Submission History page, users can print, download, copy, open in a new window and manage access to eNOIs that have not been submitted as well as perform post-submission actions (as described on page 32)

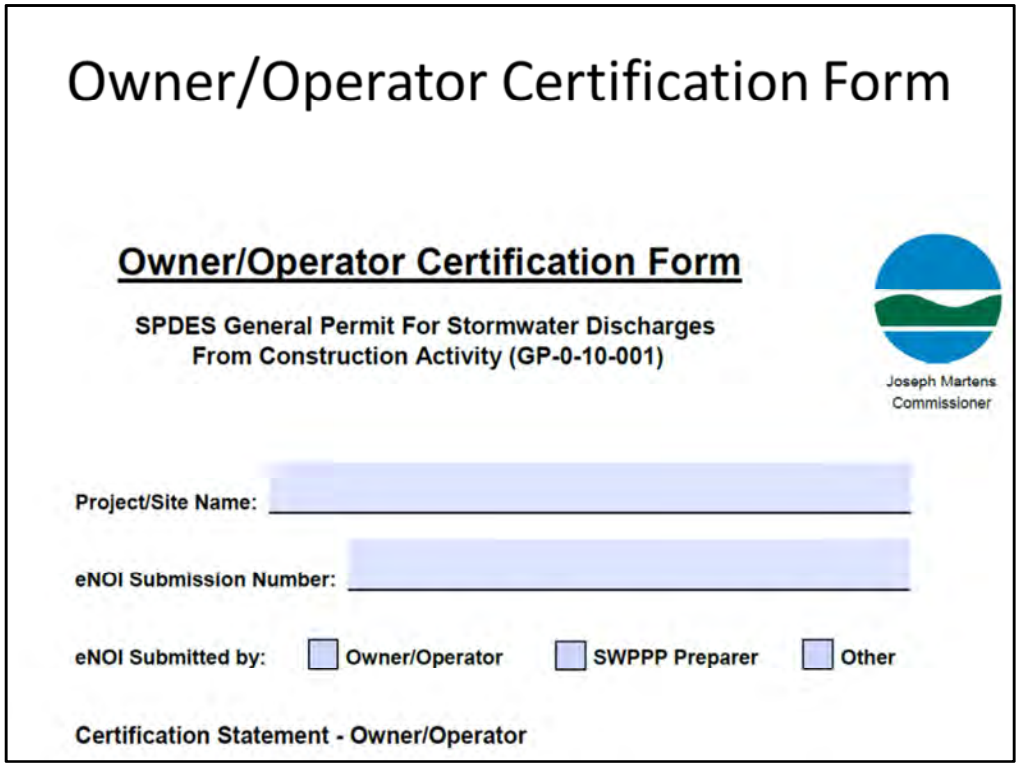
Review of Information



Once the form is located and selected from the Submission History list, the eNOI preparer should go to the "Review" step to view the information and make any corrections necessary so that it is accurate and complete.

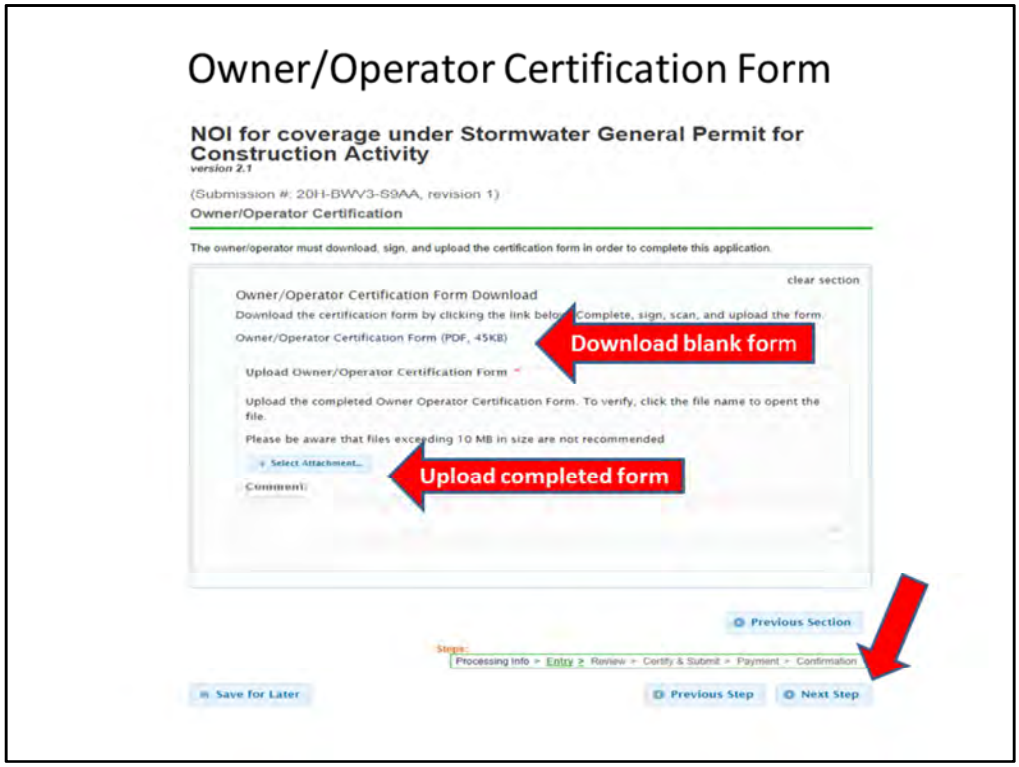


Once the form has been reviewed and determined to be complete and accurate, click the "Next Step" button to move to the Owner/Operator certification statement page.



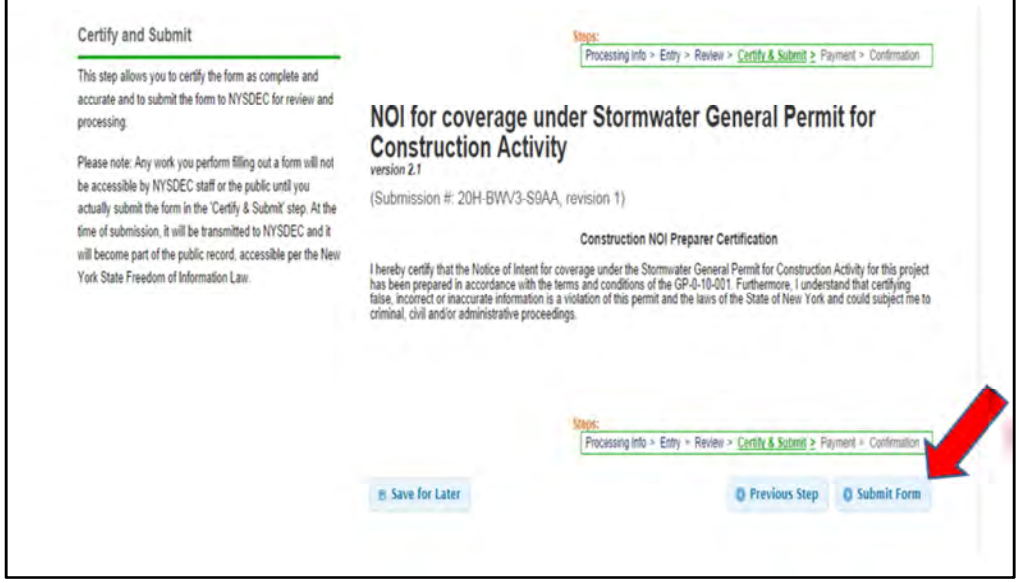
In order to be complete, the eNOI must include a completed and signed Owner/Operator Certification Form. This form can be downloaded directly from the eNOI (see next page) or from the construction stormwater webpage under Forms: http://www.dec.ny.gov/chemical/43133.html.

The eNOI preparer must have the Owner/Operator complete and sign this form and then return to them for uploading on the eNOI.



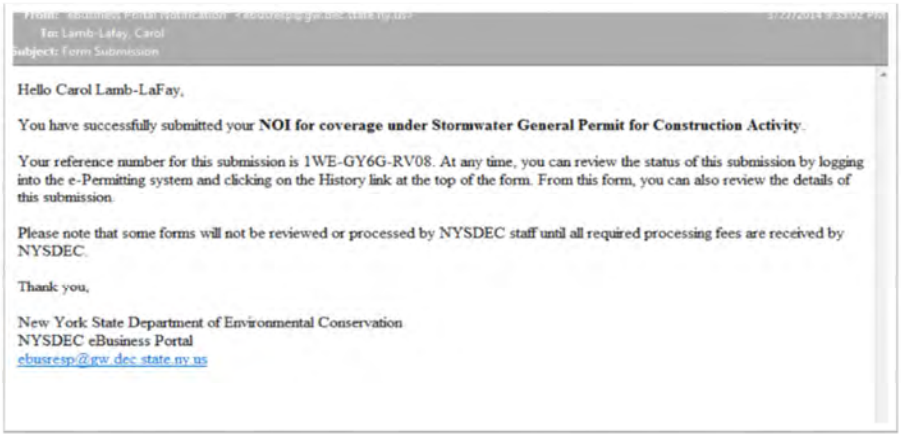
The eNOI preparer must attach a scanned version of the completed and signed Owner/Operator certification form. Once the Owner/Operator Certification Form has been uploaded, click the "Next Step" button to move to the eNOI Preparer certification statement page.

Certify and Submit Form



The eNOI preparer should read the certification statement and click on the “Submit Form” button. This will forward the eNOI to the NYSDEC for review and processing. Clicking the submit button is deemed the equivalent of signing a paper copy of the form. In the future, EPA requirements for electronic reporting may require a more involved certification process that includes re-entering the user password and correctly answering a predefined challenge question.

Email Response on Successful eNOI Submission



To: Lamb-Lafay, Carol
Subject: Form Submission

Hello Carol Lamb-LaFay,

You have successfully submitted your **NOI for coverage under Stormwater General Permit for Construction Activity**.

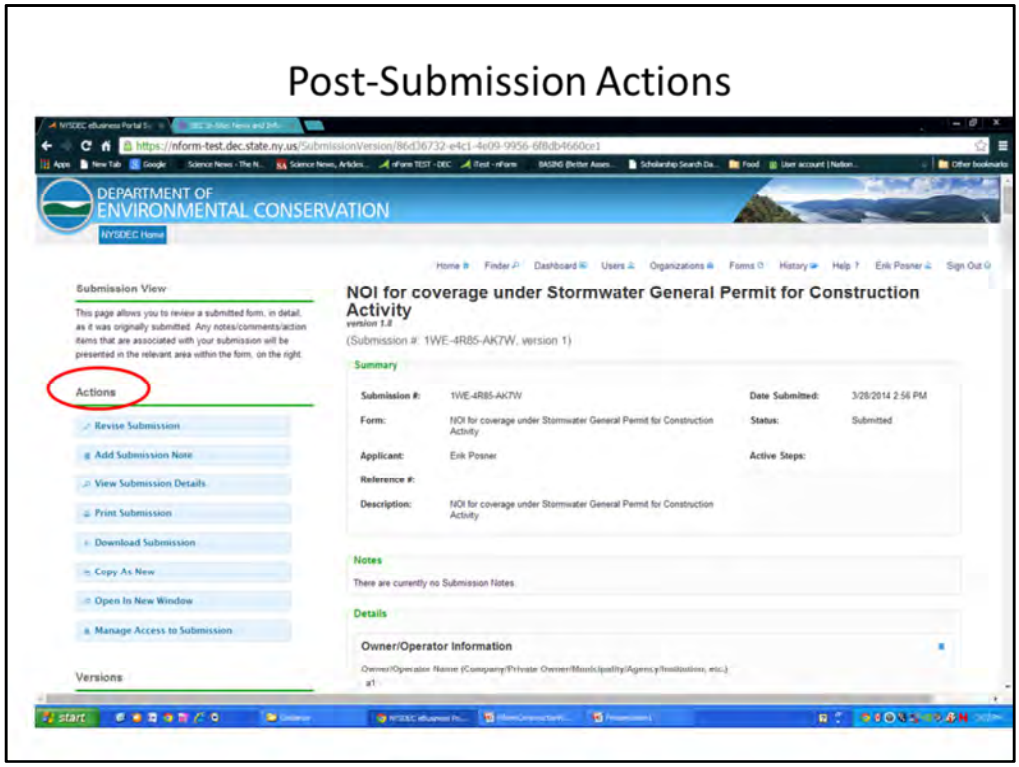
Your reference number for this submission is 1WE-GY6G-RV08. At any time, you can review the status of this submission by logging into the e-Permitting system and clicking on the History link at the top of the form. From this form, you can also review the details of this submission.

Please note that some forms will not be reviewed or processed by NYSDEC staff until all required processing fees are received by NYSDEC.

Thank you,

New York State Department of Environmental Conservation
NYSDEC eBusiness Portal
ebusresp@gw.dec.state.ny.us

The eNOI preparer will receive an email response from the eBusiness Portal indicating that the NOI was successfully submitted to NYSDEC. Submission of the eNOI to the department does not mean the project has received approval to begin construction. NYSDEC will review the submission and either deem it complete or e-mail the owner and SWPPP preparer if additional information is needed. NOIs that are deemed complete will be mailed a hard copy of the NOI Acknowledgement letter that provides the permit number and date that coverage will begin. Please be advised that you cannot commence construction until you have received and complied with the conditions in your letter of acknowledgement.



Once a completed form has been submitted, its data is encrypted and stored in a secure system. The submission can no longer be deleted. There are several additional actions that users can perform after the form submission by clicking on the "View" icon of the eNOI on the Submission History Page :

Revise Submission – Each submission has a revision number, which starts at 1 for the initial version. If changes need to be made to the submitted form, the "*Revise Submission*" button is clicked and a new revision of the form becomes active and the user is able to change any information within it. Each new revision must be submitted when complete, and the new data will replace that of earlier revisions.

Print Submission – A copy of the submitted form can be printed.

Download Submission – The submitted form can be downloaded in PDF format and saved.

Copy as New – A previously submitted form can be copied and used as a template for a new submission. This will create a copy of the form with of its data and a new, unique submission ID. This new copy can be modified and used as a new submission, and can be particularly useful when submitting a report on a regular basis (e.g. Annual reports).

Open In New Window – Opens a second copy of the form in a new window. Useful when you want to compare two copies of a submission.

Manage Access to Submission - If more than one user needs to be able to view or edit the form, additional registered users can be granted access by clicking the "Manage Access to Submission" button on the left side of the page. The next screen will display a box to enter the email address of the person to whom access will be granted. This user must currently be a registered user of the nForm system. Below this is a list of all users with access to the form.

Questions/Assistance

- Toni Cioffi
  - 518-402-8109
  - toni.Cioffi@dec.ny.gov
- Dave Gasper
  - 518-402-8114
  - david.gasper@dec.ny.gov

ATTACHMENT B-2

EROSION AND SEDIMENT CONTROLS

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

New York State Standards and Specifications for Erosion and Sediment Control

August 2005

New York State
Department of Environmental Conservation

George E. Pataki, Governor

STANDARD AND SPECIFICATIONS FOR TEMPORARY CRITICAL AREA PLANTINGS

Definition

Providing erosion control protection to a critical area for an interim period. A critical area is any disturbed, denuded slope subject to erosion.

Purpose

To provide temporary erosion and sediment control. Temporary control is achieved by covering all bare ground areas that exist as a result of construction or a natural event.

Conditions Where Practice Applies

Temporary seedings may be necessary on construction sites to protect an area, or section, where final grading is complete, when preparing for winter work shutdown, or to provide cover when permanent seedings are likely to fail due to mid-summer heat and drought. The intent is to provide temporary protective cover during temporary shutdown of construction and/or while waiting for optimal planting time.

Criteria

Water management practices must be installed as appropriate for site conditions. The area must be rough graded and slopes physically stable. Large debris and rocks are usually removed. Seedbed must be seeded within 24 hours of disturbance or scarification of the soil surface will be necessary prior to seeding.

Fertilizer or lime are not typically used for temporary seedings.

IF: Spring or summer or early fall, then seed the area with ryegrass (annual or perennial) at 30 lbs. per acre (Approximately 0.7 lb./1000 sq. ft. or use 1 lb./1000 sq. ft.).
IF: Late fall or early winter, then seed Certified 'Aroostook' winter rye (cereal rye) at 100 lbs. per acre (2.5 lbs./1000 sq. ft.).

Any seeding method may be used that will provide uniform application of seed to the area and result in relatively good soil to seed contact.

Mulch the area with hay or straw at 2 tons/acre (approx. 90 lbs./1000 sq. ft. or 2 bales). Quality of hay or straw mulch allowable will be determined based on long term use and visual concerns. Mulch anchoring will be required where wind or areas of concentrated water are of concern. Wood fiber hydromulch or other sprayable products approved for erosion control (nylon web or mesh) may be used if applied according to manufacturers' specification. Caution is advised when using nylon or other synthetic products. They may be difficult to remove prior to final seeding.

STANDARD AND SPECIFICATIONS FOR MULCHING

Definition

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/ acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

Table 3.7
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7”	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2”	9 cu. yds.	405 cu. yds.	3”	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/ yd. 60-90 lbs./roll	48” x 50 yds. or 48” x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	8” x 100” 2-sided plastic, 48” x 180” 1-sided plastic	—	—	Use without additional mulch. Excellent for seeding establishment. Tie down as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Compost	Up to 3” pieces, moderately to highly stable	3-9 cu. yds.	134-402 cu. yds.	1-3”	Coarser textured mulches may be more effective in reducing weed growth and wind erosion.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

Table 3.8
Mulch Anchoring Guide

Anchoring Method or Material	Kind of Mulch to be Anchored	How to Apply
1. Peg and Twine	Hay or straw	After mulching, divide areas into blocks approximately 1 sq. yd. in size. Drive 4-6 pegs per block to within 2" to 3" of soil surface. Secure mulch to surface by stretching twine between pegs in criss-cross pattern on each block. Secure twine around each peg with 2 or more tight turns. Drive pegs flush with soil. Driving stakes into ground tightens the twine.
2. Mulch netting	Hay or straw	Staple the light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations. Should be biodegradable. Most products are not suitable for foot traffic.
3. Wood cellulose fiber	Hay or straw	Apply with hydroseeder immediately after mulching. Use 500 lbs. wood fiber per acre. Some products contain an adhesive material ("tackifier"), possibly advantageous.
4. Mulch anchoring tool	Hay or straw	Apply mulch and pull a mulch anchoring tool (blunt, straight discs) over mulch as near to the contour as possible. Mulch material should be "tucked" into soil surface about 3".
5. Tackifier	Hay or straw	Mix and apply polymeric and gum tackifiers according to manufacturer's instructions. Avoid application during rain. A 24-hour curing period and a soil temperature higher than 45^0 Fahrenheit are required.

STANDARD AND SPECIFICATIONS FOR TEMPORARY SWALE

Definition

A temporary excavated drainage way.

Purpose

The purpose of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device.

Conditions Where Practice Applies

Temporary swales are constructed:

1. to divert flows from entering a disturbed area.

2. intermittently across disturbed areas to shorten overland flow distances.

3. to direct sediment laden water along the base of slopes to a trapping device.

4. to transport offsite flows across disturbed areas such as rights-of-way.

Swales collecting runoff from disturbed areas shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 5A.2 on page 5A.5 for details.

	Swale A	Swale B
Drainage Area	<5 Ac	5-10 Ac
Bottom Width of Flow Channel	4 ft	6 ft
Depth of Flow Channel	1 ft	1 ft
Side Slopes	2:1 or flatter	2:1 or flatter
Grade	0.5% Min. 20% Max.	0.5% Min. 20% Max.

For drainage areas larger than 10 acres, refer to the Standard and Specification for Waterways on page 5B.11.

Stabilization

Stabilization of the swale shall be completed within 7 days of installation in accordance with the appropriate standard and specifications for vegetative stabilization or stabilization with mulch as determined by the time of year. The flow channel shall be stabilized as per the following criteria:

Type of Treatment	Channel Grade[1]	Flow Channel A (<5 Ac.)	Flow Channel B (5-10 Ac)
1	0.5-3.0%	Seed & Straw Mulch	Seed & Straw Mulch
2	3.1-5.0%	Seed & Straw Mulch	Seed and cover with RECP, Sod, or lined with plastic or 2 in. stone
3	5.1-8.0%	Seed and cover with RECP, Sod, or line with plastic or 2 in. stone	Line with 4-8 in. or stone or Recycled Concrete Equivalent[2] or geotextile
4	8.1-20%	Line with 4-8 in. stone or Recycled Concrete Equivalent[2] or geotextile	Site Specific Engineering Design

[1] In highly erodible soils, as defined by the local approving agency, refer to the next higher slope grade for type of stabilization.
[2] Recycled Concrete Equivalent shall be concrete broken into the required size, and shall contain no steel reinforcement.

Outlet

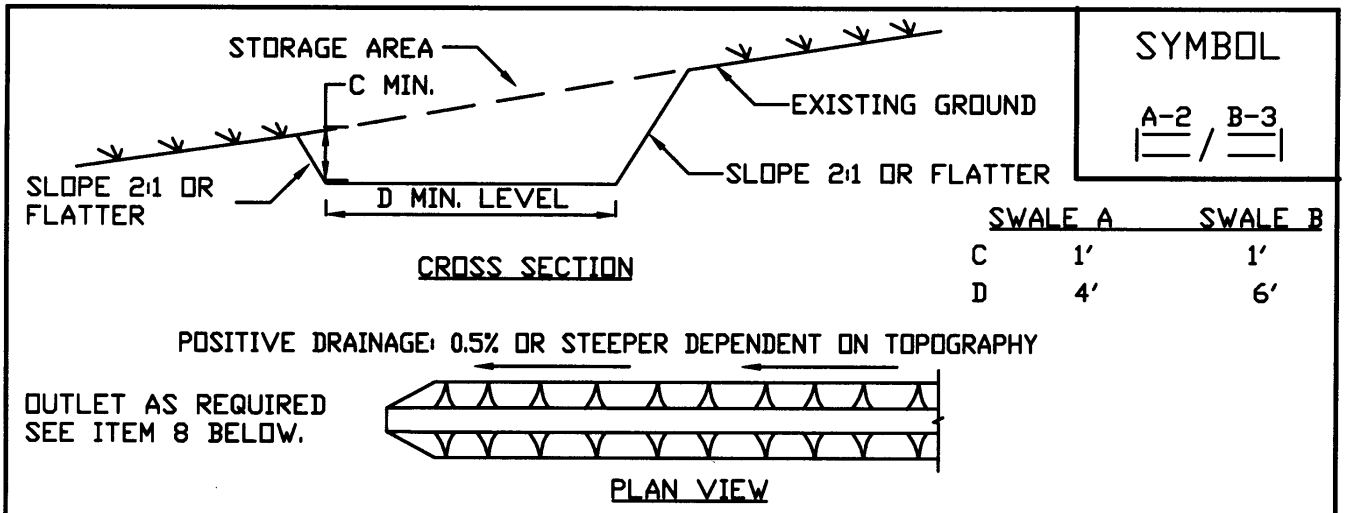
Swale shall have an outlet that functions with a minimum of erosion, and dissipates runoff velocity prior to discharge off the site.

Runoff shall be conveyed to a sediment trapping device such as a sediment trap or sediment basin until the drainage area above the swale is adequately stabilized.

The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet condition.

If a swale is used to divert clean water flows from entering a disturbed area, a sediment trapping device may not be needed.

Figure 5A.2
Temporary Swale



CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. STABILIZATION SHALL BE AS PER THE FLOW CHANNEL STABILIZATION CHART BELOW:

TYPE OF TREATMENT	CHANNEL GRADE	A(5 AC. OR LESS)	B(5 AC -10AC)
1	0.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED AND COVER USING RECP
3	5.1-8.0%	SEED AND COVER WITH RECP	LINED WITH 4-8" RIP-RAP OR GEOTEXTILE
4	8.1-20.%	LINED WITH 4-8" RIP-RAP OR GEOTEXTILE	ENGINEERED DESIGN

9. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

TEMPORARY SWALE

STANDARD AND SPECIFICATIONS FOR PERIMETER DIKE/SWALE

Definition

A temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area.

Purpose

The purpose of a perimeter dike/swale is to prevent off site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area.

Conditions Where Practice Applies

Perimeter dike/swale is constructed to divert flows from entering a disturbed area, or along tops of slopes to prevent flows from eroding the slope, or along base of slopes to direct sediment laden flows to a trapping device.

The perimeter dike/swale shall remain in place until the disturbed areas are permanently stabilized.

Design Criteria

See Figure 5A.3 on page 5A.8 for details.

The perimeter dike/swale shall not be constructed outside the property lines without obtaining legal easements from affected adjacent property owners. A design is not required for perimeter dike/swale. The following criteria shall be used:

Drainage area – Less than 2 acres (for drainage areas larger than 2 acres but less than 10 acres, see earth dike or temporary swale; for drainage areas larger than 10 acres, see standard and specifications for diversion).

Height – 18 inches minimum from bottom of swale to top of dike evenly divided between dike height and swale depth.

Bottom width of dike – 2 feet minimum.

Width of swale – 2 feet minimum.

Grade – Dependent upon topography, but shall have positive drainage (sufficient grade to drain) to an adequate outlet. Maximum allowable grade not to exceed 8 percent.

Stabilization – The disturbed area of the dike and swale shall be stabilized within 7 days of installation, in accordance with the standard and specifications for temporary swales.

Outlet

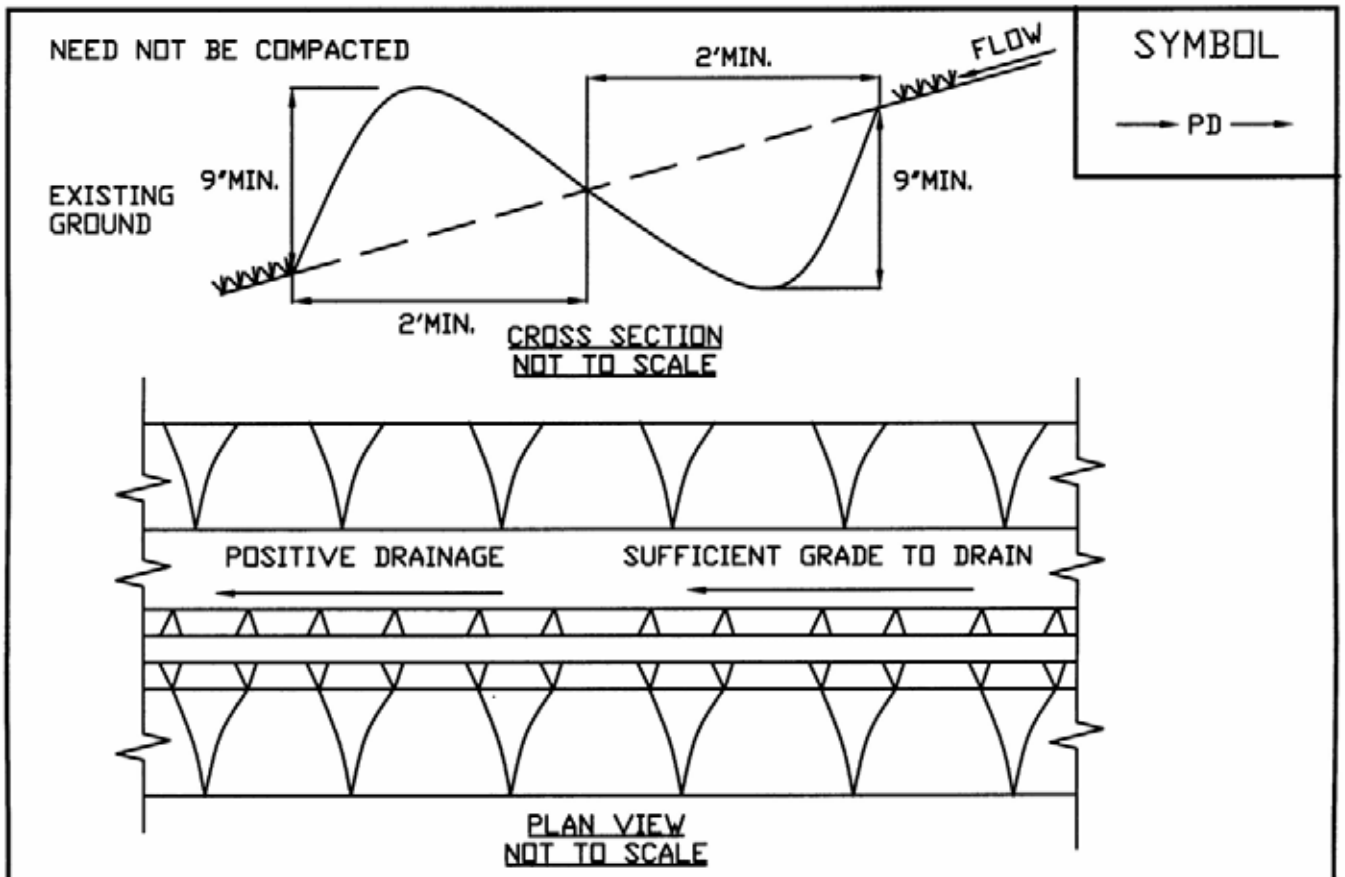
1. Perimeter dike/swale shall have a stabilized outlet.

2. Diverted runoff from a protected or stabilized upland area shall outlet directly onto an undisturbed stabilized area.

3. Diverted runoff from a disturbed or exposed upland area shall be conveyed to a sediment trapping device such as a sediment trap, sediment basin, or to an area protected by any of these practices.

4. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

Figure 5A.3
Perimeter Dike/Swale



CONSTRUCTION SPECIFICATIONS

1. ALL PERIMETER DIKE/SWALE SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSION VELOCITY.
4. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.
5. STABILIZATION OF THE AREA DISTURBED BY THE DIKE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATIONS FOR TEMPORARY SEEDING AND MULCHING, AND SHALL BE DONE WITHIN 10 DAYS.
6. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

MAX. DRAINAGE AREA LIMIT: 2 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

PERIMETER DIKE OR SWALE

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE

Definition

A temporary barrier of straw, or similar material, used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes have an estimated design life of three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits.

Constructed Slope	Percent Slope	Slope Length (ft.)
2:1	50	25
3:1	33	50
4:1	25	75

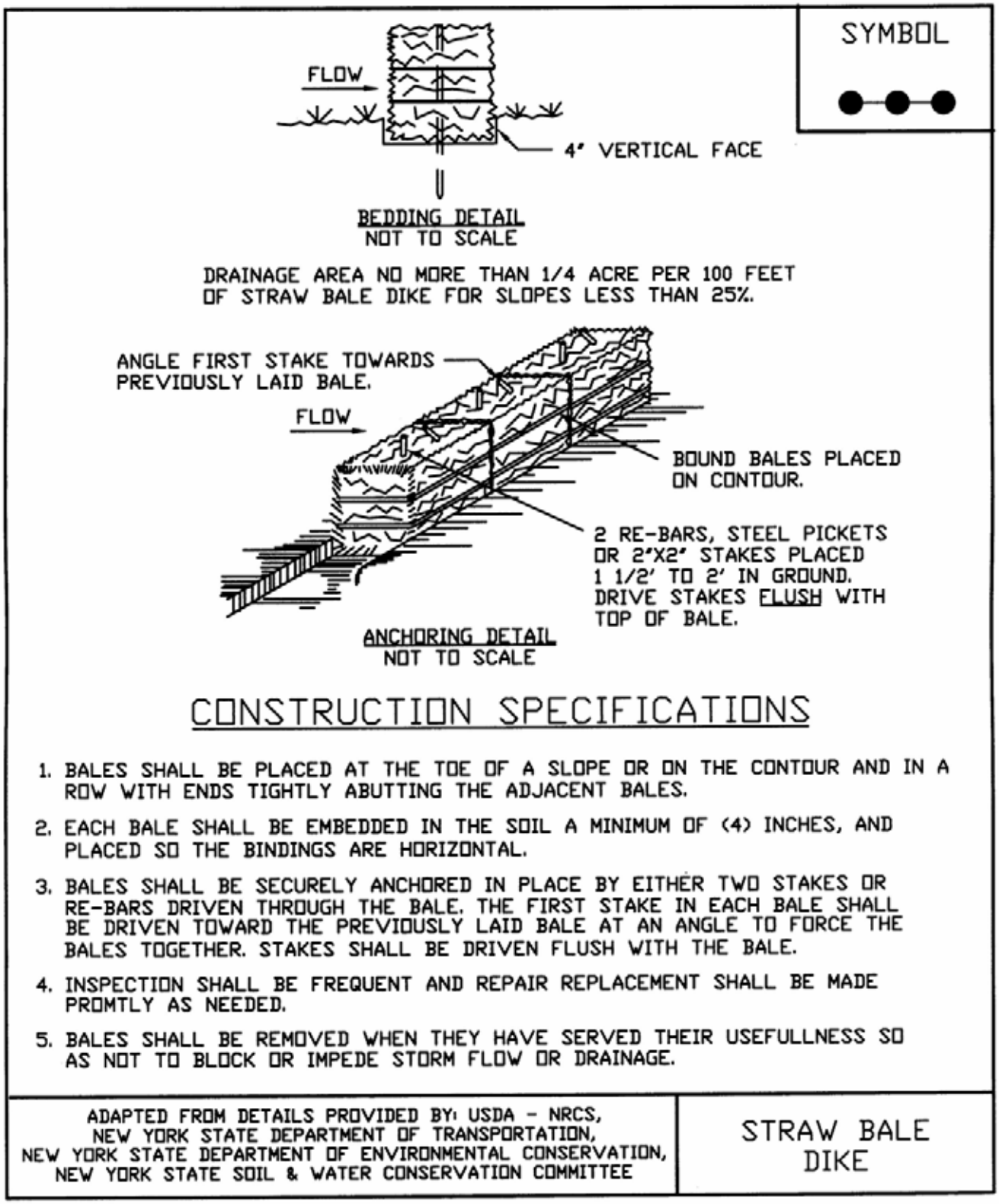
Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage areas in this instance shall be less than one quarter of an acre per 100 feet of fence and the length of slope above the dike shall be less than 200 feet.

Design Criteria

The above table is adequate, in general, for a one-inch rainfall event. Larger storms could cause failure of this practice. Use of this practice in sensitive areas for longer than one month should be specifically designed to store expected runoff. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 5A.7 on page 5A.18 or details.

Figure 5A.7
Straw Bale Dike



STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

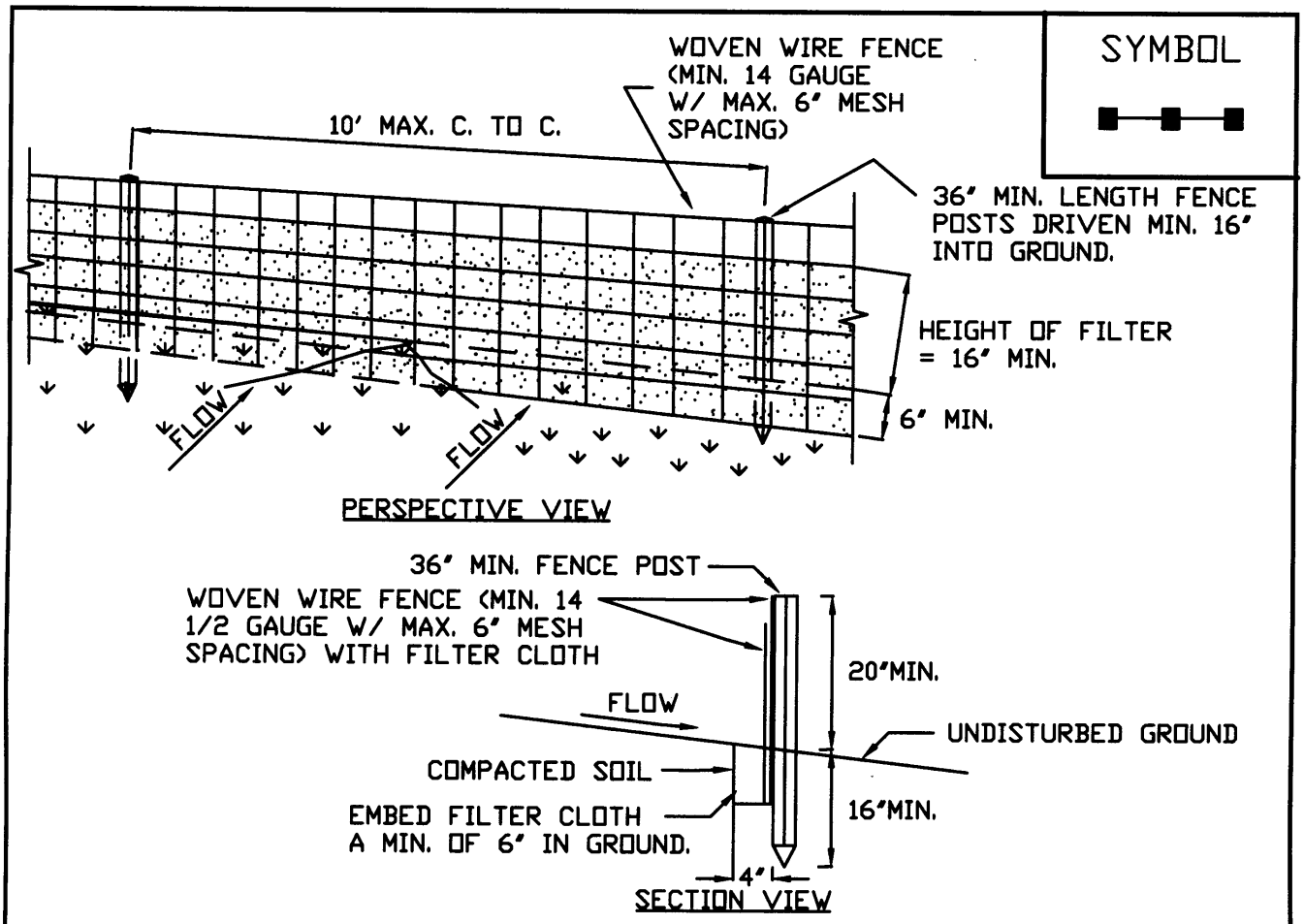
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in Figure 5A.8.

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS FOR SEDIMENT TRAP

Definition

A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and retain the sediment.

Purpose

The purpose of the structure is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation.

Conditions Where Practice Applies

A sediment trap is usually installed in a drainage way, at a storm drain inlet, or other points of collection from a disturbed area.

Sediment traps should be used to artificially break up the natural drainage area into smaller sections where a larger device (sediment basin) would be less effective.

Design Criteria

If any of the design criteria presented here cannot be met, see Standard and Specification for Sediment Basin on page 5A.49.

Drainage Area

The drainage area for sediment traps shall be in accordance with the specific type of sediment trap used (Type I through V).

Location

Sediment traps shall be located so that they can be installed prior to grading or filling in the drainage area they are to protect. Traps must not be located any closer than 20 feet from a proposed building foundation if the trap is to function during building construction. Locate traps to obtain maximum storage benefit from the terrain and for ease of cleanout and disposal of the trapped sediment.

Trap Size

The volume of a sediment trap as measured at the elevation of the crest of the outlet shall be at least 3,600 cubic feet per acre of drainage area. The volume of a constructed trap shall be calculated using standard mathematical procedures. The volume of a natural sediment trap may be approximated by the equation: Volume (cu.ft.) = 0.4 x surface area (sq.ft.) x maximum depth (ft.).

Trap Cleanout

Sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to ½ of the design depth of the trap. Sediment removed from the trap shall be deposited in a protected area and in such a manner that it will not erode.

Embankment

All embankments for sediment traps shall not exceed five (5) feet in height as measured at the low point of the original ground along the centerline of the embankment. Embankments shall have a minimum four (4) foot wide top and side slopes of 2:1 or flatter. The embankment shall be compacted by traversing with equipment while it is being constructed. The embankment shall be stabilized with seed and mulch as soon as it is completed

The elevation of the top of any dike directing water to any sediment trap will equal or exceed the maximum height of the outlet structure along the entire length of the trap.

Excavation

All excavation operations shall be carried out in such a manner that erosion and water pollution shall be minimal. Excavated portions of sediment traps shall have 1:1 or flatter slopes.

Outlet

The outlet shall be designed, constructed, and maintained in such a manner that sediment does not leave the trap and that erosion at or below the outlet does not occur.

Sediment traps must outlet onto stabilized (preferable undisturbed) ground, into a watercourse, stabilized channel, or into a storm drain system. Distance between inlet and outlet should be maximized to the longest length practicable.

Trap Details Needed on Erosion and Sediment Control Plans

Each trap shall be delineated on the plans in such a manner that it will not be confused with any other features. Each trap on a plan shall indicate all the information necessary to properly construct and maintain the structure. If the drawings are such that this information cannot be delineated on the drawings, then a table shall be developed. If a table is developed, then each trap on a plan shall have a number and the numbers shall be consecutive.

The following information shall be shown for each trap in a summary table format on the plans.

1. Trap number
2. Type of trap
3. Drainage area
4. Storage required
5. Storage provided (if applicable)
6. Outlet length or pipe sizes
7. Storage depth below outlet or cleanout elevation
8. Embankment height and elevation (if applicable)

Type of Sediment Traps

There are five (5) specific types of sediment traps which vary according to their function, location, or drainage area.

I. Pipe Outlet Sediment Trap
II. Grass Outlet Sediment Trap
III. Catch Basin Sediment Trap
IV. Stone Outlet Sediment Trap
V. Riprap Outlet Sediment Trap

I. Pipe Outlet Sediment Trap

A Pipe Outlet Sediment Trap consists of a trap formed by embankment or excavation. The outlet for the trap is through a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of steel, corrugated metal or other suitable material. The top of the embankment shall be at least 1 ½ feet above the crest of the riser. The top 2/3 of the riser shall be perforated with one (1) inch nominal diameter holes or slits spaced six (6) inches vertically and horizontally placed in the concave portion of the corrugated pipe.

No holes or slits will be allowed within six (6) inches of the top of the horizontal barrel. All pipe connections shall be watertight. The riser shall be wrapped with ½ to ¼ inch hardware cloth wire then wrapped with filter cloth with a sieve size between #40-80 and secured with strapping or connecting band at the top and bottom of the cloth. The cloth shall cover an area at least six (6) inches above the highest hole and six (6) inches below the lowest hole. The top of the riser pipe shall not be covered with filter cloth. The riser shall have a base with sufficient weight to prevent flotation of the riser. Two approved bases are:

1. A concrete base 12 in. thick with the riser embedded 9 in. into the concrete base, or

2. One quarter inch, minimum, thick steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2.5 feet of stone, gravel, or earth placed on it to prevent flotation. In either case, each side of the square base measurement shall be the riser diameter plus 24 inches.

Pipe outlet sediment traps shall be limited to a five (5) acre maximum drainage area. Pipe outlet sediment traps may be interchangeable in the field with stone outlet or riprap sediment traps provided that these sediment traps are constructed in accordance with the detail and specifications for that trap.

Select pipe diameter from the following table:

Minimum Sizes

Barrel Diameter[1] (in.)	Riser Diameter[1] (in.)	Maximum Drainage Area (ac.)
12	15	1
15	18	2
18	21	3
21	24	4
21	27	5

[1] Barrel diameter may be same size as riser diameter.

See details for Pipe Outlet Sediment Trap ST-I in Figure 5A.16 (1) and 5A.16 (2) on pages 5A.38 and 5A.39.

II. Grass Outlet Sediment Trap

A Grass Outlet Sediment Trap consists of a trap formed by excavating the earth to create a holding area. The trap has a discharge point over natural existing grass. The outlet crest width (feet) shall be equal to four (4) times the drainage area (acres) with a minimum width of four (4) feet. The outlet shall be free of any restrictions to flow. The outlet lip must remain undisturbed and level. The volume of this trap shall be computed at the elevation of the crest of the outlet. Grass outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Grass Outlet Sediment Trap ST-II in Figure 5A.17 on page 5A.40.

III. Catch Basin Sediment Trap

A Catch Basin Sediment Trap consists of a basin formed by excavation on natural ground that discharges through an opening in a storm drain inlet structure. This opening can either be the inlet opening or a temporary opening made by omitting bricks or blocks in the inlet.

A yard drain inlet or an inlet in the median strip of a dual highway could use the inlet opening for the type outlet. The trap should be out of the roadway so as not to interfere with future compaction or construction. Placing the trap on the opposite side of the opening and diverting water from the roadway to the trap is one means of doing this. Catch basin sediment traps shall be limited to a three (3) acre maximum drainage area. The volume of this trap is measured at the elevation of the crest of the outlet (invert of the inlet opening).

See details for Catch Basin Sediment Trap ST-III in Figure 5A.18 on page 5A.41.

IV. Stone Outlet Sediment Trap

A Stone Outlet Sediment Trap consists of a trap formed by an embankment or excavation. The outlet of this trap is over a stone section placed on level ground. The minimum length (feet) of the outlet shall be equal to four (4) times the drainage area (acres).

Required storage shall be 3,600 cubic feet per acre of drainage area.

The outlet crest (top of stone in weir section) shall be level, at least one (1) foot below top of embankment and no more than one (1) foot above ground beneath the outlet. Stone used in the outlet shall be small riprap (4 in. x 8 in.). To provide more efficient trapping effect, a layer of filter cloth should be embedded one (1) foot back into the upstream face of the outlet stone or a one (1) foot thick layer of two (2) inch or finer aggregate shall be placed on the upstream face of the outlet.

Stone Outlet Sediment Traps may be interchangeable in the field with pipe or riprap outlet sediment traps provided they are constructed in accordance with the detail and specifications for those traps. Stone outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

See details for Stone Outlet Sediment Trap ST-IV in Figure 5A.19 on page 5A.42.

V. Riprap Outlet Sediment Trap

A Riprap Outlet Sediment Trap consists of a trap formed by an excavation and embankment. The outlet for this trap shall be through a partially excavated channel lined with riprap. This outlet channel shall discharge onto a stabilized area or to a stable watercourse. The riprap outlet sediment trap may be used for drainage areas of up to a maximum of 15 acres.

Design Criteria for Riprap Outlet Sediment Trap

1. The total contributing drainage area (disturbed or undisturbed either on or off the developing property) shall not exceed 15 acres.
2. The storage needs for this trap shall be computed using 3600 cubic feet of required storage for each acre of drainage area. The storage volume provided can be figured by computing the volume of storage area available behind the outlet structure up to an elevation of one (1) foot below the level weir crest.
3. The maximum height of embankment shall not exceed five (5) feet.
4. The elevation of the top of any dike directing water to a riprap outlet sediment trap will equal or exceed the minimum elevation of the embankment along the entire length of this trap.

Riprap Outlet Sediment Trap ST-V
(for Stone Lined Channel)

Contributing Drainage Area (ac.)	Depth of Channel (a) (ft.)	Length of Weir (b) (ft.)
1	1.5	4.0
2	1.5	5.0
3	1.5	6.0
4	1.5	10.0
5	1.5	12.0
6	1.5	14.0
7	1.5	16.0
8	2.0	10.0
9	2.0	10.0
10	2.0	12.0
11	2.0	14.0
12	2.0	14.0
13	2.0	16.0
14	2.0	16.0
15	2.0	18.0

See details for Riprap Outlet Sediment Trap ST-V on Figures 5A.20(1) and 5A.20(2) on pages 5A.43 and 5A.44.

Optional Dewatering Methods

Optional dewatering devices may be designed for use with sediment traps. Included are two methods, which may be used. See Figure 5A.21 on page 5A.45 for details.

Figure 5A.16(1)
Pipe Outlet Sediment Trap: ST-I

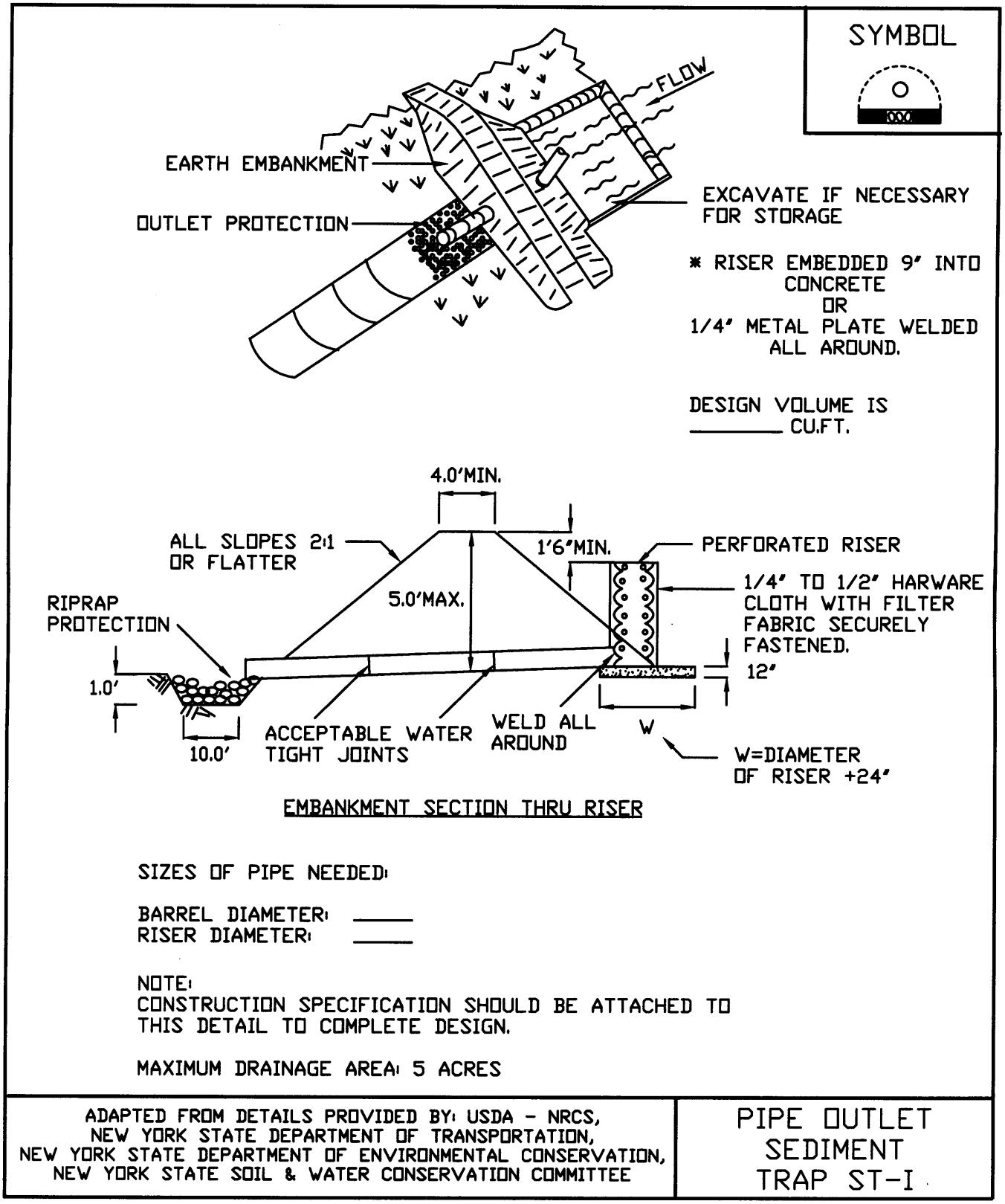


Figure 5A.16(2)
Pipe Outlet Sediment Trap: ST-I—Construction Specifications

SYMBOL

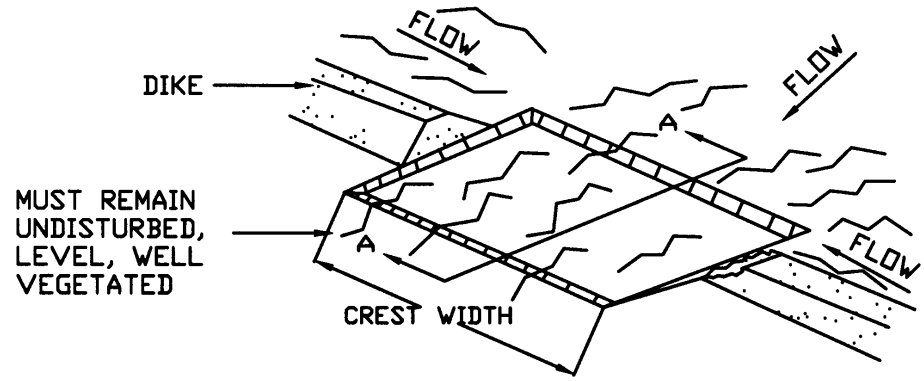
CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
4. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
5. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
6. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
7. THE STRUCTURE SHALL BE REMOVED AND AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
8. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER; CUT SLOPES 1:1 OR FLATTER.
9. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
10. THE TOP 2/3 OF THE RISER SHALL BE PERFORATED WITH ONE (1) INCH DIAMETER HOLES OR SLITS SPACED SIX (6) INCHES VERTICALLY AND HORIZONTALLY AND PLACED IN THE CONCAVE PORTION OF PIPE. NO HOLES WILL BE ALLOWED WITHIN SIX (6) INCHES OF THE HORIZONTAL BARREL.
11. THE RISER SHALL BE WRAPPED WITH 1/4 TO 1/2 INCH HARDWARE CLOTH WIRE THEN WRAPPED WITH FILTER CLOTH (HAVING AN EQUIVALENT SIEVE SIZE OF 40-80). THE FILTER CLOTH SHALL EXTEND SIX (6) INCHES ABOVE THE HIGHEST HOLE AND SIX (6) INCHES BELOW THE LOWEST HOLE. WHERE ENDS OF THE FILTER CLOTH COME TOGETHER, THEY SHALL BE OVER-LAPPED, FOLDED AND STAPLED TO PREVENT BYPASS.
12. STRAPS OR CONNECTING BANDS SHALL BE USED TO HOLD THE FILTER CLOTH AND WIRE FABRIC IN PLACE. THEY SHALL BE PLACED AT THE TOP AND BOTTOM OF THE CLOTH.
13. FILL MATERIAL AROUND THE PIPE SPILLWAY SHALL BE HAND COMPACTED IN FOUR (4) INCH LAYERS. A MINIMUM OF TWO (2) FEET OF HAND COMPACTED BACKFILL SHALL BE PLACED OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
14. THE RISER SHALL BE ANCHORED WITH EITHER A CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. FOR CONCRETE BASED THE DEPTH SHALL BE TWELVE (12) INCHES WITH THE RISER EMBEDDED NINE (9) INCHES. A 1/4 INCH MINIMUM THICKNESS STEEL PLATE SHALL BE ATTACHED TO THE RISER BY A CONTINUOUS WELD AROUND THE BOTTOM TO FORM A WATERTIGHT CONNECTION AND THEN PLACE TWO (2) FEET OF STONE, GRAVEL, OR TAMPED EARTH ON THE PLATE.

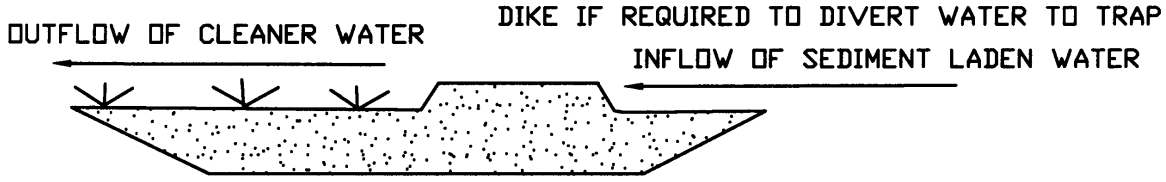
ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

PIPE OUTLET
SEDIMENT TRAP
ST-I

Figure 5A.17
Grass Outlet Sediment Trap: ST-II



SYMBOL



CREST WIDTH (FT)=4xDRAINAGE AREA (ACRES)

SECTION A - A
EXCAVATED GRASS OUTLET SEDIMENT TRAP

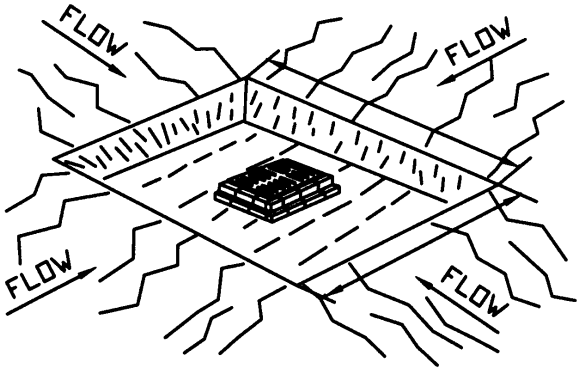
CONSTRUCTION SPECIFICATIONS

1. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE AREA.
2. MINIMUM CREST WIDTH SHALL BE 4 x DRAINAGE AREA
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
4. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
5. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
6. THE SEDIMENT TRAP SHALL BE REMOVED AND AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
7. ALL CUT SLOPES SHALL BE 1:1 OR FLATTER.

MAXIMUM DRAINAGE AREA: 5 ACRES

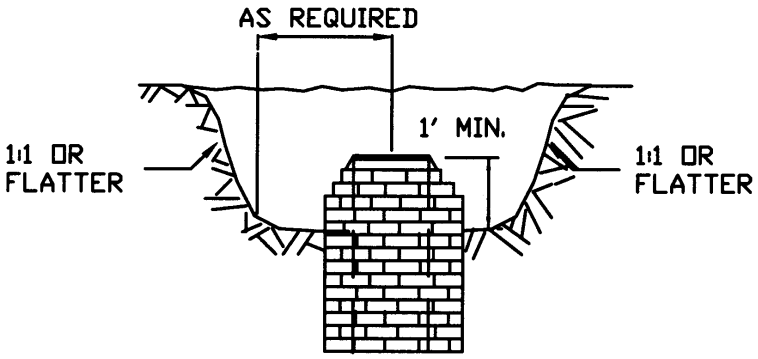
ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	GRASS OUTLET SEDIMENT TRAP ST-II

Figure 5A.18
Catch Basin Sediment Trap: ST-III



SYMBOL

YARD DRAIN



CROSS SECTION

CONSTRUCTION SPECIFICATIONS

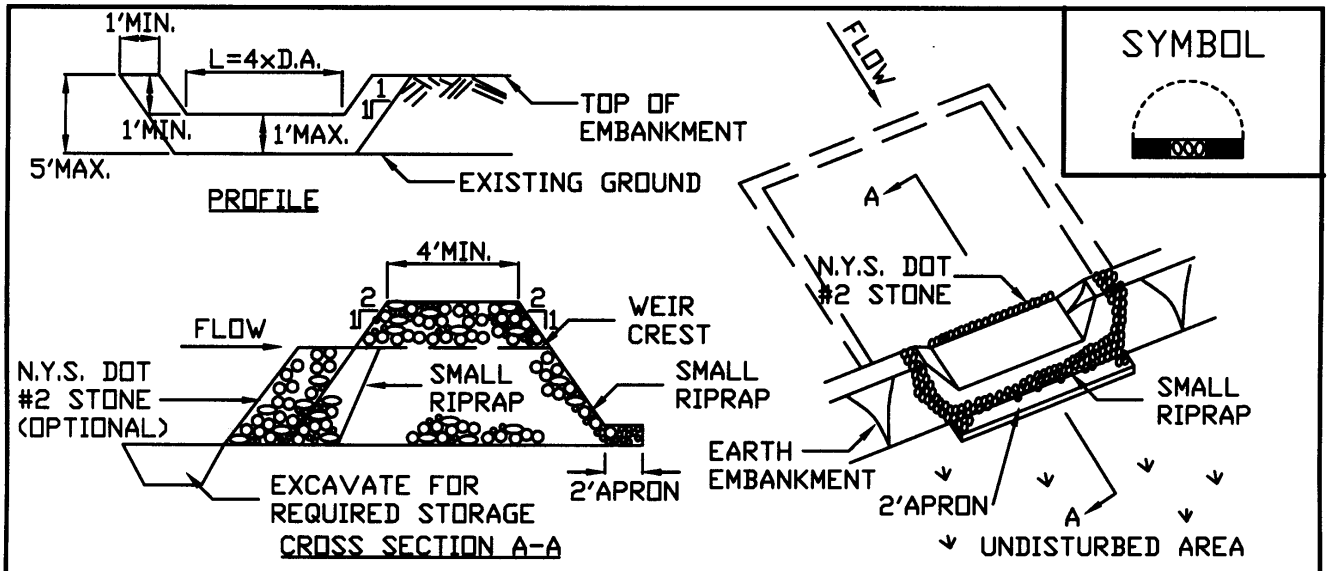
1. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
2. THE VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
3. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
5. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE CONSTRUCTED DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
6. ALL CUT SLOPES SHALL BE 1:1 OR FLATTER.

MAXIMUM DRAINAGE AREA: 3 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

CATCH BASIN
SEDIMENT TRAP
ST-III

Figure 5A.19
Stone Outlet Sediment Trap: ST-IV



OPTION: A ONE FOOT LAYER OF N.Y.S. DOT #2 STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIPRAP INPLACE OF THE EMBEDDED FILTER CLOTH.

CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP-GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. IT SHALL BE PLACED ON SITE AND STABILIZED.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

MAXIMUM DRAINAGE AREA 5 ACRES

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STONE OUTLET SEDIMENT TRAP ST-IV

Figure 5A.20(1)
Riprap Outlet Sediment Trap: ST-V

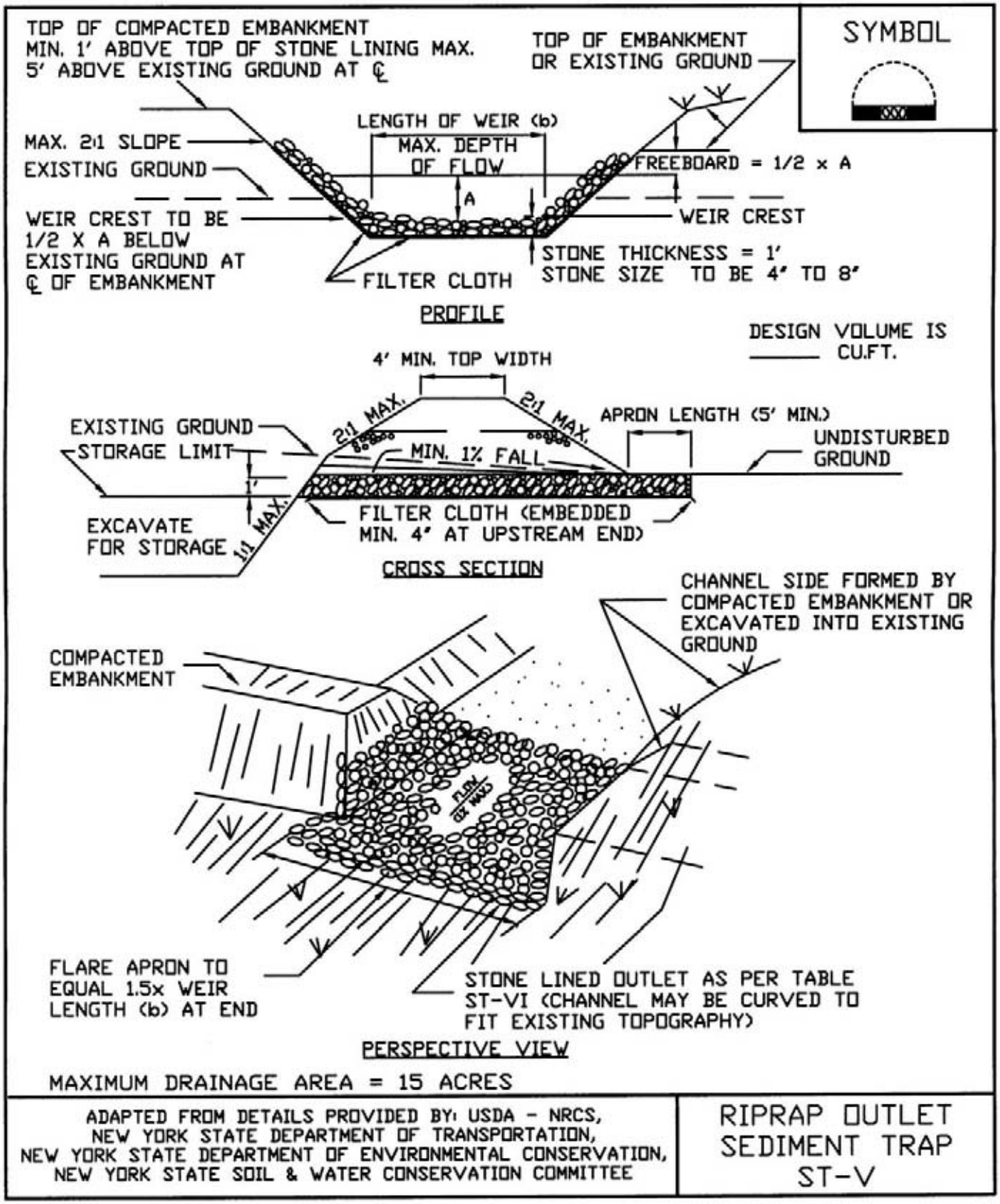


Figure 5A.202)
Riprap Outlet Sediment Trap: ST-V—Construction Specifications

SYMBOL

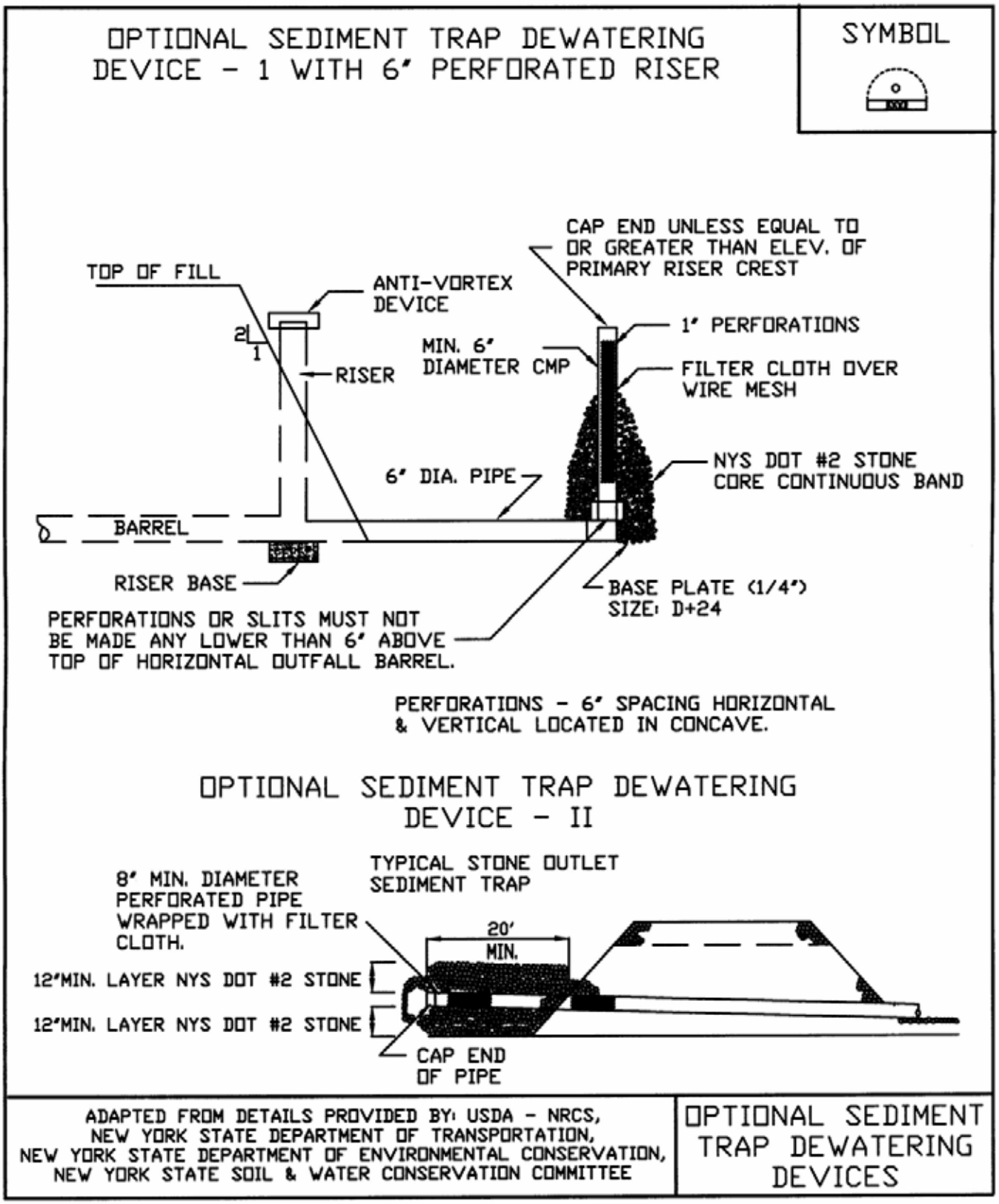
CONSTRUCTION SPECIFICATIONS

1. THE AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED. MAXIMUM HEIGHT OF OF EMBANKMENT SHALL BE FIVE (5) FEET, MEASURED AT CENTERLINE OF EMBANKMENT.
3. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER, CUT SLOPES 1:1 OR FLATTER.
4. ELEVATION OF THE TOP OF ANY DIKE DIRECTING WATER INTO TRAP MUST EQUAL OR EXCEED THE HEIGHT OF EMBANKMENT.
5. STORAGE AREA PROVIDED SHALL BE FIGURED BY COMPUTING THE VOLUME AVAILABLE BEHIND THE OUTLET CHANNEL UP TO AN ELEVATION OF ONE (1) FOOT BELOW THE LEVEL WEIR CREST.
6. FILTER CLOTH SHALL BE PLACED OVER THE BOTTOM AND SIDES OF THE OUTLET CHANNEL PRIOR TO PLACEMENT OF STONE. SECTIONS OF FABRIC MUST OVERLAP AT LEAST ONE (1) FOOT WITH SECTION NEAREST THE ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST SIX (6) INCHES INTO EXISTING GROUND AT ENTRANCE OUTLET CHANNEL.
7. STONE USED IN THE OUTLET CHANNEL SHALL BE FOUR (4) TO EIGHT (8) INCH RIPRAP. TO PROVIDE A FILTERING EFFECT, A LAYER OF FILTER CLOTH SHALL BE EMBEDDED ONE (1) FOOT WITH SECTION NEAREST ENTRANCE PLACED ON TOP. FABRIC SHALL BE EMBEDDED AT LEAST SIX (6) INCHES INTO EXISTING GROUND AT ENTRANCE OF OUTLET CHANNEL.
8. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
9. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRED AS NEEDED.
10. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
11. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
12. DRAINAGE AREA FOR THIS PRACTICE IS LIMITED TO 15 ACRES OR LESS.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

RIPRAP OUTLET
SEDIMENT TRAP
ST-V

Figure 5A.21
Optional Sediment Trap Dewatering Devices



ATTACHMENT B-3

COMMUNITY AIR MONITORING REQUIREMENTS

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^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

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

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

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

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

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

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

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

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

APPENDIX C

HEALTH & SAFETY PLAN
&
COMMUNITY AIR MONITORING PLAN

BROWNFIELD CLEANUP PROGRAM

APPENDIX C
HEALTH AND SAFETY PLAN

275 FRANKLIN STREET SITE, BCP SITE NO. C915208
AND
432 PEARL STREET SITE NO. C915237
BUFFALO, NEW YORK

July 2017 0156-016-002

Prepared for:
BUFFALO DEVELOPMENT CORPORATION

Prepared by:

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In Association With:

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2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
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275 Franklin Street & 432 Pearl Street Sites
Health and Safety Plan

Plan Reviewed by (initial):

Corporate Health and Safety Director: Thomas H. Forbes

Project Manager: Thomas H. Forbes

Designated Site Safety and Health Officer: Richard L. Dubisz

Acknowledgement:

I acknowledge that I have reviewed the information contained in this site-specific Health and Safety Plan, and understand the hazards associated with performance of the field activities described herein. I agree to comply with the requirements of this plan.

NAME (PRINT)	SIGNATURE	DATE

TurnKey Environmental Restoration, LLC

Benchmark Environmental Engineering & Science, PLLC

HEALTH AND SAFETY PLAN
275 FRANKLIN STREET & 432 PEARL STREET SITES

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1.0 INTRODUCTION

1.1 General

This Health and Safety Plan (HASP) is an appendix to the Site Management Plan (SMP), a required element of the remedial program for the 275 Franklin Street and 432 Pearl Street Sites (hereinafter referred to as the "BCP Sites") under the New York State (NYS) Brownfield Cleanup Program (BCP), administered by New York State Department of Environmental Conservation (NYSDEC). The BCP Sites were remediated in accordance with Brownfield Cleanup Agreement (BCA) Index Nos. B9-0722-06-07 (275 Franklin Street Site) executed in October 2006 andC915237-10-10 (432 Pearl Street Site) executed in May 2011

In accordance with OSHA requirements contained in 29 CFR 1910.120 and USEPA Standard Operating Safety Guidelines, this HASP describes the specific health and safety practices and procedures to be employed by Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC employees (referred to jointly hereafter as TurnKey-Benchmark) during redevelopment activities at the BCP Sites in Buffalo, New York (see Figure 1). This HASP presents information and procedures for TurnKey-Benchmark employees who will be involved with field activities, including the assignment of responsibilities, personnel protection requirements, work practices, and emergency response procedures. It is not intended to cover the activities of other contractors or subcontractors on the Site; these firms will be required to develop and enforce their own HASPs as discussed below. In order to ensure that proper coordination on such key issues as emergency notification and decontamination exists between TurnKey-Benchmark and other contractors or subcontractors, TurnKey-Benchmark will review all HASPs and coordinate procedures where appropriate.

This HASP presents information on known Site health and safety hazards using available historical information for previously investigated areas of the BCP Sites and identifies the equipment, materials, and procedures that will be used to eliminate or control these hazards. Environmental monitoring will be performed during the course of field activities to provide real-time data for on-going assessment of potential hazards. This HASP will be updated as new investigation data becomes available.

All TurnKey-Benchmark personnel involved with the field activities associated with these BCP Sites will be required to comply with this HASP and any field modifications as directed by the Site Safety and Health Officer (SSHO).

1.2 Site Location and Description

BDC owns or is a contract vendee to the four adjoining parcels that are part of a common proposed redevelopment project. The properties are collectively referred to throughout this document as the BCP Sites and are identified as follows:

- BCP Site No. C915208, identified as the 275 Franklin Street Site and encompassing the following parcels:
  - Parcel 111.38-2-22, addressed as 275-277 Franklin Street, (± 0.14 acres)
  - Parcel 111.38-2-23, addressed as 279 Franklin Street, (± 0.13 acres)
- BCP Site No. C915237, identified as the 432 Pearl Street Site and encompassing the following parcels:
  - Parcel 111.38-2-20.1, addressed as 267 Franklin Street, (± 0.25 acres)
  - Parcel 111.38-2-4.1, addressed as 432 Pearl Street, (± 0.45 acres)

The Sites are improved with an apartment building and parking lots. The BCP Sites are bounded by a restaurant and surface parking lot to the north; Pearl Street to the east; a mixed use building to the south; and Franklin Street to the west.

1.3 Site History

The BCP Sites have been used for various purposes since the late 1800s. From at least 1951 through the early 2000s, 275-277 Franklin Street was used as a dry cleaner. The property located at 279 Franklin Street was used for residential purposes from the late 1800s through at least 1951, and was a parking lot from at least 1981 to the present. In 1925, the 432 Pearl Street Site was used for residential and hot air heater manufacturing and by 1951 it was being used as residential and a parking lot. The property at 267 Franklin Street (part of the 432 Pearl Street Site) has been used as an apartment building since at least 1925.

1.4 Site Investigations and Remediation

A Limited Environmental Investigation was performed at 275-277 Franklin Street by Nature's Way Environmental Consultants & Contractors, Inc. in September 2004. The results of that investigation indicated that Site soils and groundwater have been impacted by tetrachloroethene (PCE), a chlorinated volatile organic compound (VOC), typically associated with dry cleaning operations.

In March 2006, Benchmark performed a Preliminary Site Investigation at 275-277 Franklin Street, 279 Franklin Street, 432 Pearl Street, and 470 Pearl Street. The Preliminary Site Investigation was performed to assess soil/fill materials and soil vapor on-site and to ascertain if subsurface environmental conditions on these parcels were likely to impact Site redevelopment. The results of the investigation indicate that Site soils have been impacted by semi-volatile organic compounds (SVOCs), mercury, and lead. In addition, soil vapor samples collected from 279 Franklin Street and 432 Pearl Street contained several chlorinated VOCs.

Benchmark completed RI activities in November 2006, December 2006, and January 2007, and a supplement RI in April 2008 in order to fill in data gaps and investigate the quality of deeper groundwater on the BCP Sites.

An interim remedial measure (IRM) was conducted on the 275 Franklin Street Site from summer 2008 through fall 2009. Following submittal of the RI/AA/IRM Report in April 2010, NYSDEC required additional groundwater remedial measures beyond the proposed in-situ HRC injections in the vicinity of MW-5 "source area" on the 275 Franklin Street Site in order to mitigate off-site migration of cVOCs. In September 2011, BDC submitted an Additional IRM Work Plan to NYSDEC expanding the proposed IRM to include both the 275 Franklin Street BCP Site and the 267 Franklin Street parcel of the 432 Pearl Street Site. The Additional IRM Work Plan specifically proposed in-situ groundwater treatment at the source area and downgradient property boundary to mitigate off-site cVOC plume migration. NYSDEC required further assessment of deep groundwater on-site; therefore, BDC installed an additional deep groundwater well (MW-7) on the 267 Franklin Street parcel of the 432 Pearl Street Site in May 2012 and completed a round of comprehensive groundwater sampling, which included certain off-site wells as requested by NYSDEC.

The Revised RI/AA/IRM Report was submitted in January 2013. Following review of the report, NYSDEC provided additional comments in July 2013 and prepared draft Proposed Decision Documents for each BCP Site. The final RI/AA.IRM Report was submitted to NYSDEC in July 2013 and approved September 30, 2013. In April 2014 and March/April 2016, additional in-situ groundwater treatment was performed. In December 2016, source area soil/fill was excavated and a chemical oxidant was added to the excavation bottom to address residual impact. Two rounds of post-injection groundwater monitoring was performed in January and April 2017.

1.5 Overview of Field Activities

Potential field activities include:

- Subsurface soil sampling from borings completed using both direct-push and hollow-stem auger drilling techniques.
- Sub-grade vapor sampling using a hand-held drill and Summa canisters.
- Subsurface soil boring and field characterization during piezometer and monitoring well installations.
- Development and sampling of monitoring wells and piezometers including measurement of field parameters.

2.0 ORGANIZATIONAL STRUCTURE

This chapter of the HASP describes the lines of authority, responsibility, and communication as they pertain to health and safety functions at the Site. The purpose of this chapter is to identify the personnel who will impact the development and implementation of the HASP and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations and establishes the lines of communication among them for heath and safety matters. The organizational structure described in this chapter is consistent with the requirements of 29 CFR 1910.120(b)(2). This section will be reviewed by the Project Manager and updated as necessary to reflect the current organizational structure at this Site.

2.1 Roles and Responsibilities

All TurnKey-Benchmark personnel on the Site must comply with the minimum requirements of this HASP. The specific responsibilities and authority of management, safety, and health, and other personnel on this Site are detailed in the following paragraphs.

2.1.1 Corporate Health and Safety Director

The TurnKey-Benchmark Corporate Health and Safety Director is **Mr. Thomas H. Forbes**. The Corporate Health and Safety Director is responsible for developing and implementing the Health and Safety program and policies for TurnKey-Benchmark, and consulting with corporate management to ensure adequate resources are available to properly implement these programs and policies. The Corporate Health and Safety Director coordinates TurnKey-Benchmark's Health and Safety training and medical monitoring programs, and assists project management and field staff in developing site-specific health and safety plans.

2.1.2 Project Manager

The Project Manager for this Site is **Mr. Michael Lesakowski**. The Project Manager has the responsibility and authority to direct all TurnKey-Benchmark work operations at the Site. The Project Manager coordinates safety and health functions with the Site Safety and

Health Officer (SSHO), and bears ultimate responsibility for proper implementation of this HASP. He may delegate authority to expedite and facilitate any application of the program, including modifications to the overall project approach as necessary to circumvent unsafe work conditions. Specific duties of the Project Manager include:

- Preparing and coordinating the Site Work Plan.
- Providing TurnKey-Benchmark workers with work assignments and overseeing their performance.
- Coordinating health and safety efforts with the SSHO.
- Reviewing the emergency response coordination plan to assure its effectiveness.
- Serving as the primary liaison with Site contractors and the property owner.

2.1.3 Site Safety and Health Officer

The SSHO is **Mr. Richard L. Dubisz**. The SSHO reports to the Project Manager. The SSHO is on-site or readily accessible to the Site during all work operations and has the authority to halt work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

- Managing the safety and health functions for TurnKey-Benchmark personnel on the Site.
- Serving as the point of contact for safety and health matters.
- Ensuring that TurnKey-Benchmark field personnel working on the Site have received proper training (per 29 CFR Part 1910.120(e)), that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134), and that they are properly trained in the selection, use and maintenance of personal protective equipment, including qualitative respirator fit testing.
- Performing or overseeing Site monitoring as required by the HASP.
- Assisting in the preparation and review of the HASP.
- Maintaining site-specific safety and health records as described in this HASP.
- Coordinating with the Project Manager, Site Workers, and Contractor's SSHO as necessary for safety and health efforts.

2.1.4 Site Workers

Site workers are responsible for: complying with this HASP or a more stringent HASP, if appropriate (i.e., Contractor and Subcontractor's HASP); using proper PPE; reporting unsafe acts and conditions to the SSHO; and following the safety and health instructions of the Project Manager and SSHO.

2.1.5 Other Site Personnel

Other Site personnel who will have health and safety responsibilities in the work zone will include subcontractors and governmental agencies performing Site inspection work (i.e., NYSDEC and/or its designated oversight contractor) who will be responsible for developing, implementing and enforcing a Health and Safety Plan equally stringent or more stringent than TurnKey-Benchmark's HASP. TurnKey-Benchmark assumes no responsibility for the health and safety of anyone outside its direct employ. During activities involving subcontractors, the subcontractor's HASP shall cover all non-TurnKey-Benchmark Site personnel. The subcontractor(s) shall assign a SSHO who will coordinate with TurnKey-Benchmark's SSHO as necessary to ensure effective lines of communication and consistency between contingency plans.

3.0 HAZARD EVALUATION

The possibility exists that workers will be exposed to hazardous substances during subsurface soil sampling, well development, and groundwater monitoring. The principal points of exposure would be through direct contact with impacted media or vapors during sample collection and handling activities. In addition, the use of large equipment will also present conditions for potential physical injury to workers. Adherence to the medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, establishment work zones and site control, appropriate decontamination procedures and contingency planning outlined herein will reduce the potential for chemical exposures and physical injuries.

3.1 Chemical Hazards

Table 1 identifies known constituents of potential concern and ranges of concentrations, by media, observed during previous investigations. Based on this work, the constituents of potential concern include specific chlorinated organics, polyaromatic hydrocarbons, mercury, and lead. Table 2 lists toxicity and exposure data for these constituents of potential concern. Brief descriptions of the toxicology of these materials and related health and safety guidance and criteria are provided below.

- **Tetrachloroethene (PCE)** is used a solvent for greases, waxes and rubbers. It is harmful by ingestion inhalation and skin absorption. Exposure can cause dermatitis, dizziness, nausea, liver, and kidney damage. This compound is a suspected carcinogen.
- **Trichloroethene** (**TCE)** was formally widely used in dry cleaning operations and metal degreasing. It is toxic by inhalation and skin absorption. It is an irritant to the skin, eyes, and mucous membranes. Symptoms of exposure may include headache, dizziness, and nausea. Exposure may cause liver and kidney damage. TCE is a suspected human carcinogen.
- **1,1,1-Trichloroethane (1,1,1-TCA)** is a colorless liquid with a characteristic odor. The substance can be absorbed into the body by inhalation of its vapor and by ingestion. It is an irritant to the eyes, skin, and respiratory tract. Symptoms of exposure may include headache, dizziness, and nausea.
- **Polycyclic Aromatic Hydrocarbons (PAHs)** are formed as a result of the pyrolysis and incomplete combustion of organic matter such as fossil fuel. PAH aerosols

formed during the combustion process disperse throughout the atmosphere, resulting in the deposition of PAH condensate in soil, water and on vegetation. In addition, several products formed from petroleum processing operations (e.g., roofing materials and asphalt) also contain elevated levels of PAHs. Hence, these compounds are widely dispersed in the environment. PAHs are characterized by a molecular structure containing three or more fused, unsaturated carbon rings. Seven of the PAHs are classified by USEPA as probable human carcinogens (USEPA Class B2). These are: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The primary route of exposure to PAHs is through incidental ingestion and inhalation of contaminated particulates. PAHs are characterized by an organic odor, and exist as oily liquids in pure form. Acute exposure symptoms may include acne-type blemishes in areas of the skin exposed to sunlight.

- **Lead** can affect almost every organ and system in our bodies. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed. Lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect memory. Lead may cause anemia.
- **Mercury** is used in industrial applications for the production of caustic and chlorine, and in electrical control equipment and apparatus. Over-exposure to mercury may cause coughing, chest pains, bronchitis, pneumonia, indecision, headaches, fatigue, and salivation. Mercury is a skin and eye irritant.

With respect to the anticipated activities defined in Section 1.4, possible routes of exposure to the above-mentioned contaminants are presented in Table 3. The use of proper respiratory equipment, as outlined in Section 7.0, will minimize the potential for exposure to airborne contamination. Further, exposure to contaminants through dermal and other routes will also be minimized through the use of protective clothing (Section 7.0), safe work practices (Section 6.0), and proper decontamination procedures (Section 12.0).

3.2 Physical Hazards

Field activities at the BCP Sites may present the following physical hazards:

- The potential for physical injury during heavy equipment use, such as drill rigs.
- The potential for slip and fall injuries due to slippery terrain.

These hazards represent only some of the possible means of injury that may be present during investigation and sampling activities at the Sites. Since it is impossible to list

all potential sources of injury, it shall be the responsibility of each individual to exercise proper care and caution during all phases of the work.

4.0 TRAINING

4.1 Site Workers

All personnel performing site investigation activities (such as, but not limited to, equipment operators and general laborers) and who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors/managers responsible for the site shall receive training in accordance with 29 CFR 1910.120(e) before they are permitted to engage in operations in the exclusion zone or contaminant reduction zone. This training includes an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor. Additional site-specific training shall also be provided by the SSHO prior to the start of field activities. A description of topics to be covered by this training is provided below.

4.1.1 Initial and Refresher Training

Initial and refresher training is conducted by a qualified instructor as specified under OSHA 29 CFR 1910.120(e)(5), and is specifically designed to meet the requirements of OSHA 29 CFR 1910.120(e)(3) and 1910.120(e)(8). The training covers, as a minimum, the following topics:

- OSHA HAZWOPER regulations.
- Site safety and hazard recognition, including chemical and physical hazards.
- Medical monitoring requirements.
- Air monitoring, permissible exposure limits, and respiratory protection level classifications.
- Appropriate use of personal protective equipment (PPE), including chemical compatibility and respiratory equipment selection and use.
- Work practices to minimize risk.
- Work zones and Site control.
- Safe use of engineering controls and equipment.
- Decontamination procedures.
- Emergency response and escape.

- Confined space entry procedures.
- Heat and cold stress monitoring.
- Elements of a Health and Safety Plan.
- Spill containment.

Initial training also incorporates workshops for PPE and respiratory equipment use (Levels A, B and C), and respirator fit testing. Records and certification received from the course instructor documenting each employee's successful completion of the training identified above are maintained on file at Benchmark Environmental Engineering and Science, PLLC's Buffalo, NY office. Contractors and Subcontractors are required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not been certified as having received health and safety training in conformance with 29 CFR 1910.120(e) is prohibited from working in the exclusion and contamination reduction zones, or to engage in any on-site work activities that may involve exposure to hazardous substances or wastes.

4.1.2 Site Training

Site workers are given a copy of the HASP and provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with the HASP and the information and requirements it contains. The site briefing shall be provided by the SSHO prior to initiating field activities and shall include:

- Names of personnel and alternates responsible for Site safety and health.
- Safety, health and other hazards present on the Site.
- The Site lay-out including work zones and places of refuge.
- The emergency communications system and emergency evacuation procedures.
- Use of PPE.
- Work practices by which the employee can minimize risks from hazards.
- Safe use of engineering controls and equipment on the Site.
- Medical surveillance, including recognition of symptoms and signs of over-exposure (see Section 5).

- Decontamination procedures (see Section 12).
- The Emergency Response Plan (see Attachment 1).
- Confined space entry procedures, if required (see Section 13).
- The spill containment program (see Section 9).
- Site control (see Section 11).

Supplemental health and safety briefings will also be conducted by the SSHO on an as-needed basis during the course of the work. Supplemental briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during on-going Site characterization and analysis. Conditions for which the SSHO may schedule additional briefings include, but are not limited to: a change in Site conditions (i.e., based on monitoring results); changes in the work schedule/plan; newly discovered hazards; and safety incidents occurring during Site work.

4.2 Supervisor Training

On-site safety and health personnel who are directly responsible for or who supervise the safety and health of workers engaged in hazardous waste operations (i.e., SSHO) shall receive, in addition to the appropriate level of worker training described in Section 4.1, above, 8 additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

4.3 Emergency Response Training

Emergency response training is addressed in Attachment 1 of this HASP, Emergency Response Plan.

4.4 Site Visitors

TurnKey-Benchmark's SSHO will provide a site-specific briefing to all Site visitors and other non-TurnKey-Benchmark personnel who enter the Site beyond the Site entry point. The site-specific briefing will provide information about Site hazards, the Site lay-out including work zones and places of refuge, the emergency communications system and

emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

Site visitors will not be permitted to enter the exclusion zone or contaminant reduction zones unless they have received the level of training required for Site workers as described in Section 4.1.

5.0 MEDICAL MONITORING

Medical monitoring examinations are provided to TurnKey-Benchmark employees as stipulated under 29 CFR Part 1910.120(f). These exams include initial employment and termination physicals for all TurnKey-Benchmark employees involved in hazardous waste Site field operations. Annual exams are provided for those employees who are engaged in hazardous waste site field operations for more than 30 days per year, or who meet other specific criteria listed in 29 CFR 1910.120(f). Post-exposure examinations are also provided for employees who may have been injured, received a health impairment, or developed signs or symptoms of over-exposure to hazardous substances or were accidentally exposed to substances at concentrations above the permissible exposure limits without necessary personal protective equipment. Such exams are performed as soon as possible following development of symptoms or the known exposure event.

Medical evaluations are performed by Health Works WNY, an occupational health care provider under contract with TurnKey-Benchmark. Health Works WNY's local facility is located at 1900 Ridge Road, West Seneca, New York 14224. The facility can be reached at (716) 823-5050 to schedule routine appointments or post-exposure examinations.

Medical evaluations are conducted according to the TurnKey-Benchmark Medical Monitoring Program and include an evaluation of the workers' ability to use respiratory protective equipment. The examinations include:

- Occupational/medical history review.
- Physical exam, including vital sign measurement.
- Spirometry testing.
- Eyesight testing.
- Audio testing (minimum baseline and exit, annual for employees routinely exposed to greater than 85db).
- EKG (for employees >40 yrs age or as medical conditions dictate).
- Chest X-ray (baseline and exit, and every 5 years).
- Blood biochemistry (including blood count, white cell differential count, serum multiplastic screening).
- Medical certification of physical requirements (i.e., sight, musculoskeletal, cardiovascular) for safe job performance and to wear respiratory protection

equipment.

The purpose of the medical evaluation is to determine an employee's fitness for duty on hazardous waste sites; and to establish baseline medical data.

In conformance with OSHA regulations, TurnKey-Benchmark will maintain and preserve medical records for a period of 30 years following termination of employment. Employees are provided a copy of the physician's post-exam report, and have access to their medical records and analyses.

6.0 SAFE WORK PRACTICES

All TurnKey-Benchmark employees shall conform to the following safe work practices during all on-site work activities conducted within the exclusion and contamination reduction zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth contact is strictly prohibited.
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Respiratory protective equipment and clothing must be worn by all personnel entering the Site as required by the HASP or as modified by the Site Safety Officer. Excessive facial hair (i.e., beards, long mustaches, or sideburns) that interferes with the satisfactory respirator-to-face seal is prohibited.
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross contamination and need for decontamination.
- Due to possible contraindications, use of prescribed drugs should be reviewed with the TurnKey-Benchmark occupational physician.
- Alcoholic beverage and illegal drug intake are strictly forbidden during the work day.
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.
- On-site personnel shall use the "buddy" system. No one may work alone (i.e., out of earshot or visual contact with other workers) in the exclusion zone.
- Personnel and equipment in the contaminated area shall be minimized, consistent with effective Site operations.
- All employees have the obligation to immediately report and if possible, correct unsafe work conditions.
- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for TurnKey-Benchmark employees, as requested and required.

The recommended specific safety practices for working around the subcontractor's equipment (e.g., drill rig, site truck.) are as follows:

- Although the subcontractors are responsible for their equipment and safe

operation of the Site, TurnKey-Benchmark personnel are also responsible for their own safety.

- Subsurface work will not be initiated without first clearing underground utility services.
- Heavy equipment should not be operated within 20 feet of overhead wires. This distance may be increased if windy conditions are anticipated or if lines carry high voltage. The Site should also be sufficiently clear to ensure the project staff can move around the heavy machinery safely.
- Care should be taken to avoid overhead wires when moving heavy-equipment from location to location.
- Hard hats, safety boots, and safety glasses should be worn at all times in the vicinity of heavy equipment. Hearing protection is also recommended.
- The work Site should be kept neat. This will prevent personnel from tripping and will allow for fast emergency exit from the Site.
- Proper lighting must be provided when working at night.
- Investigation activities should be discontinued during an electrical storm or severe weather conditions.
- The presence of combustible gases should be checked before igniting any open flame.
- Personnel shall stand upwind of any investigation activity when not immediately involved in sampling/logging/observing activities.
- Personnel will not approach the edge of an unsecured trench/excavation closer than two feet.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 Equipment Selection

Personal protective equipment (PPE) will be donned when work activities may result in exposure to physical or chemical hazards beyond acceptable limits, and when such exposure can be mitigated through appropriate PPE. The selection of PPE will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the Site, the task-specific conditions and duration, and the hazards and potential hazards identified at the Site.

Equipment designed to protect the body against contact with known or suspect chemical hazards are grouped into four categories according to the degree of protection afforded. These categories, designated A through D consistent with United States Environmental Protection Agency (USEPA) Level of Protection designation, are:

- **Level A:** Should be selected when the highest level of respiratory, skin and eye protection is needed.
- **Level B:** Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required. Level B (or Level A) is also necessary for oxygen-deficient atmospheres.
- **Level C:** Should be selected when the types of airborne substances are known, the concentrations have been measured, and the criteria for using air-purifying respirators are met. In atmospheres where no airborne contaminants are present, Level C provides dermal protection only.
- **Level D:** Should not be worn on any site with elevated respiratory or skin hazards. This is generally a work uniform providing minimal protection.

OSHA requires the use of certain PPE under conditions where an immediate danger to life and health (IDLH) may be present. Specifically, OSHA 29 CFR 1910.120(g)(3)(iii) requires use of a positive pressure self-contained breathing apparatus, or positive pressure air-line respirator equipped with an escape air supply when chemical exposure levels present a substantial possibility of immediate serious injury, illness or death, or impair the ability to escape. Similarly, OSHA 29 CFR 1910.120(g)(3)(iv) requires donning totally-encapsulating chemical protective suits (with a protection level equivalent to Level A protection) in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate serious illness, injury or death, or impair the ability to escape.

In situations where the types of chemicals, concentrations, and possibilities of contact are unknown, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the personal protective gear itself. Ensemble components are detailed below for levels A/B, C, and D protection.

7.2 Protection Ensembles

7.2.1 Level A/B Protection Ensemble

Level A/B ensembles include similar respiratory protection, however Level A provides a higher degree of dermal protection than Level B. Use of Level A over Level B is determined by: comparing the concentrations of identified substances in the air with skin toxicity data, and assessing the effect of the substance (by its measured air concentrations or splash potential) on the small area of the head and neck unprotected by Level B clothing.

The recommended PPE for level A/B is:

- Pressure-demand, full-face piece self-contained breathing apparatus (MSHA/-NIOSH approved) or pressure-demand supplied-air respirator with escape self-contained breathing apparatus (SCBA).
- Chemical-resistant clothing. For Level A, clothing consists of totally-encapsulating chemical resistant suit. Level B incorporates hooded one-or two-piece chemical splash suit.
- Inner and outer chemical resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

7.2.2 Level C Protection Ensemble

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions permit wearing an air-purifying device. The device (when required) must be an air purifying respirator (MSHA/NIOSH approved) equipped with filter cartridges. Cartridges must be able to remove the substances

encountered. Respiratory protection will be used only with proper fitting, training, and the approval of a qualified individual. In addition, an air-purifying respirator can be used only if: oxygen content of the atmosphere is at least 19.5% in volume; substances are identified and concentrations measured; substances have adequate warning properties; the individual passes a qualitative fit-test for the mask; and an appropriate cartridge/canister is used, and its service limit concentration is not exceeded.

Recommended PPE for Level C conditions includes:

- Full-face piece, air-purifying respirator equipped with MSHA and NIOSH approved organic vapor/acid gas/dust/mist combination cartridges or as designated by the SSHO.
- Chemical-resistant clothing (hooded, one or two-piece chemical splash suit or disposable chemical-resistant one-piece suit).
- Inner and outer chemical-resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

An air monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators. Continual surveillance using direct-reading instruments is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

7.2.3 Level D Protection Ensemble

As indicated above, Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated, where there are no inhalable toxic substances and where the atmospheric contains at least 19.5% oxygen.

Recommended PPE for Level D includes:

- Coveralls.
- Safety boots/shoes.
- Safety glasses or chemical splash goggles.
- Hardhat.
- Optional gloves; escape mask; face shield.

7.2.4 Recommended Level of Protection for Site Tasks

Based on current information regarding both the contaminants suspected to be present at the Site and the various tasks that are included in the investigation, the minimum required Levels of Protection for these tasks shall be as identified in Table 4.

8.0 EXPOSURE MONITORING

8.1 General

Based on the results of historic sample analysis and the nature of the proposed work activities at the Site, the possibility exists that particulates may be released to the air during intrusive sampling activities. Ambient breathing zone concentrations may at times, exceed the permissible exposure limits (PEL) established by OSHA for the individual compounds (see Table 2), in which case respiratory protection will be required. Respiratory and dermal protection may be modified (upgraded or downgraded) by the SSHO based upon real-time field monitoring data.

8.1.1 Work Area Monitoring

Routine, real-time monitoring of the atmosphere within the work area will be conducted by TurnKey-Benchmark during all intrusive investigation phases such as drilling, well development, etc. The work area will be monitored at regular intervals using a photo-ionization detector (PID), combustible gas meter and a particulate meter. Observed values will be recorded and maintained as part of the permanent field record.

Additional air monitoring measurements may be made by TurnKey-Benchmark personnel to verify field conditions during subcontractor oversight activities. Monitoring instruments will be protected from surface contamination during use. Additional monitoring instruments may be added if the situations or conditions change.

8.1.2 Off-Site Community Monitoring

In addition to on-site monitoring within the work zone(s), monitoring at the down-wind portion of the site perimeter will be conducted when any intrusive activities are performed outdoors of the facility. This will provide a real-time method for determination of substantial vapor and/or particulate releases to the surrounding community as a result of intrusive investigation work.

The monitoring will be performed at the downwind perimeter location at regular intervals and at a minimum of once per half hour during times when organic vapors, explosive gases or particulates exceed established limits for five minutes or longer until such

time as work zone concentrations decrease to below the perimeter monitoring action levels. If sustained concentrations of organic vapors, explosive gas, or particulates are detected in excess of the threshold values identified in Section 7.2.2 at the downwind perimeter location for a period of ***5*** minutes or longer, the actions identified in Section 7.2.2 shall be taken. Pertinent emergency response information including the telephone number and address of the Fire Department are included in Attachment 1 - Emergency Response Plan.

8.2 Monitoring Action Levels

8.2.1 On-Site Levels

The PID or other appropriate instrument(s) will be used as specified in this Health and Safety Plan. Methane gas will be monitored with the "combustible gas" option on the combustible gas meter or other appropriate instrument(s) in accordance with this plan. In addition, fugitive dust/particulate concentrations will be monitored using a real-time particulate monitor as specified in this plan. Readings obtained in the breathing zone may be interpreted (with regard to other site conditions) as follows for on-site TurnKey-Benchmark personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to background on the PID) - Continue operations under Level D.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings above background to *5* ppm on the PID (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue operations under Level C.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of *5* to 50 ppm above background on the PID - Continue operations under Level B, re-evaluate and alter (if possible) construction methods to achieve lower vapor concentrations.
- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the PID - Discontinue operations and exit the work zone immediately.

The explosimeter will be used to monitor levels of both combustible gases and oxygen during construction activities. Action levels based on the instrument readings shall be as follows:

- Less than 10% LEL - Continue engineering operations with caution.

- 10-25% LEL - Continuous monitoring with extreme caution, determine source/cause of elevated reading.
- Greater than 25% LEL - Explosion hazard, evaluate source and leave the Work Zone.
- 19.5% - 21% oxygen - Proceed with extreme caution; attempt to determine potential source of oxygen displacement.
- Less than 19.5% oxygen - Leave work zone immediately.
- 21-25% oxygen - Continue engineering operations with caution.
- Greater than 25% oxygen - Fire hazard potential, leave Work Zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities. Action levels based on the instrument readings shall be as follows:

- Less than 50 µg/m^3 - Continue field operations.
- 50-150 µg/m^3 - Don dust/particulate mask or equivalent
- Greater than 150 µg/m^3 - Don dust/particulate mask or equivalent. Initiate engineering controls to reduce respirable dust concentration (i.e., wetting of excavated soils or tools at discretion of SSHO).

Readings with the combustible gas meter, particulate monitor, and organic vapor analyzers will be recorded and documented in the Health and Safety Logbook. All instruments will be calibrated before use and the procedure will be documented in the Health and Safety Logbook.

8.2.2 Community Air Monitoring

In addition to the action levels prescribed in Section 8.2.1 for TurnKey-Benchmark personnel on-site, the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Program shall also be adhered to for the protection of the nearby community (see Attachment 2).

9.0 SPILL RELEASE/RESPONSE

This chapter of the HASP describes the potential for and procedures related to spills or releases of known or suspected petroleum and/or hazardous substances on the Site. The purpose of this Section of the HASP is to plan appropriate response, control, counter-measures and reporting, consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii). The spill containment program addresses the following elements:

- Potential hazardous material spills and available controls.
- Initial notification and evaluation.
- Spill response.
- Post-spill evaluation.

9.1 Potential Spills and Available Controls

An evaluation was conducted to determine the potential for hazardous material and oil/petroleum spills at this Site. For the purpose of this evaluation, hazardous materials posing a significant spill potential are considered to be:

- CERCLA Hazardous Substances as identified in 40 CFR Part 302, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Extremely Hazardous Substances as identified in 40 CFR Part 355, Attachment 1, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Hazardous Chemicals as defined under Section 311(e) of the Emergency Planning and Community Right-To-Know Act of 1986, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Toxic Chemicals as defined in 40 CFR Part 372, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Chemicals regulated under 6NYCRR Part 597, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).

Oil/petroleum products are considered to pose a significant spill potential whenever the following situations occur:

- The potential for a "harmful quantity" of oil (including petroleum and non-petroleum-based fuels and lubricants) to reach navigable waters of the U.S. exists

(40 CFR Part 112.4). Harmful quantities are considered by USEPA to be volumes of 1,000 gallons or more, or lesser quantities that either form a visible sheen on the water or violate applicable water quality standards.

- The potential for any amount of petroleum to reach any waters of NY State, including groundwater, exists. Petroleum, as defined by NY State in 6NYCRR Part 612, is a petroleum-based heat source, energy source, or engine lubricant/maintenance fluid.
- The potential for any release, to soil or water, of petroleum from a bulk storage facility regulated under 6NYCRR Part 612. A regulated petroleum storage facility is defined by NY State as a Site having stationary tank(s) and intra-facility piping, fixtures and related equipment with an aggregate storage volume of 1100 gallons or greater.

The evaluation indicates that, based on Site history and the scope of work, a hazardous material spill is not likely to occur during investigation efforts. However, the procedures identified below will be followed in the event of an unanticipated release.

9.2 Initial Spill Notification and Evaluation

Any worker who discovers a hazardous substance or oil/petroleum spill will immediately notify the Project Manager and SSHO. The worker will, to the best of his/her ability, report the material involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, if any, and any associated injuries. The Emergency Response Plan presented in Attachment 1 of this HASP will immediately be implemented if an emergency release has occurred.

Following initial report of a spill, the Project Manager will make an evaluation as to whether the release exceeds RQ levels. If an RQ level is exceeded, the Project Manager will notify the Site owner who will in turn notify NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies are to be contacted regarding the release, and will follow-up with written reports as required by the applicable regulations.

9.3 Spill Response

For all spill situations, the following general response guidelines will apply:

- Only those personnel involved in overseeing or performing containment operations will be allowed within the spill area. If necessary, the area will be roped, ribboned, or otherwise blocked off to prevent unauthorized access.
- Appropriate PPE, as specified by the SSHO, will be donned before entering the spill area.
- Ignition points will be extinguished/removed if fire or explosion hazards exist.
- Surrounding reactive materials will be removed.
- Drains or drainage in the spill area will be blocked to prevent inflow of spilled materials or applied materials.

For minor spills, the TurnKey-Benchmark will maintain a Spill Control and Containment Kit in the Field Office or other readily accessible storage location. The kit will consist of, at a minimum, a 50 lb. bag of "speedy dry" granular absorbent material, absorbent pads, shovels, empty 5-gallon pails and an empty open-top 55-gallon drum. Spilled materials will be absorbed, and shoveled into a 55-gallon drum for proper disposal (USEPA approval will be secured for on-site treatment of the impacted soils/absorbent materials, if applicable). Impacted soils will be hand-excavated to the point that no visible signs of contamination remains, and will be drummed with the absorbent.

In the event of a major release or a release that threatens surface water, a spill response contractor will be called to the Site. The response contractor may use heavy equipment (e.g., excavator, backhoe, etc.) to berm the soils surrounding the spill site or create diversion trenching to mitigate overland migration or release to navigable waters. Where feasible, pumps will be used to transfer free liquid to storage containers. Spill control/cleanup contractors in the Western New York area that may be contacted for assistance (in order of preference) include:

- The Environmental Service Group Inc. (NY): (716) 695-0161
- Op-Tech: (716) 525-1962
- Environmental Products and Services of Vermont, Inc.: (716) 597-0001

9.4 Post-Spill Evaluation

If a reportable quantity of hazardous material or oil/petroleum is spilled as determined by the Project Manager, a written report will be prepared as indicated in Section 9.2. The report will identify the root cause of the spill, type and amount of material released,

date/time of release, response actions, agencies notified and/or involved in cleanup, and procedures to be implemented to avoid repeat incidents. In addition, all re-useable spill cleanup and containment materials will be decontaminated, and spill kit supplies/disposable items will be replenished.

10.0 HEAT/COLD STRESS MONITORING

Although most Site Investigation activities will occur in a climate controlled environment, measures will be taken to minimize heat/cold stress to TurnKey-Benchmark employees working outdoors. The SSHO and/or his or her designee will be responsible for monitoring TurnKey-Benchmark field personnel for symptoms of heat/cold stress.

10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, a common and potentially serious illnesses often encountered at construction, landfill, waste disposal, industrial or other unsheltered sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning, and age. Personal protective equipment may severely reduce the body's normal ability to maintain temperature equilibrium (via evaporation and convection), and require increased energy expenditure due to its bulk and weight.

Proper training and preventive measures will mitigate the potential for serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat (i.e., eight fluid ounces must be ingested for approximately every 1 lb of weight lost). The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost perspiration. When heavy sweating occurs, workers should be encouraged to drink more.
- Train workers to recognize the symptoms of heat related illness.

Heat-Related Illness - Symptoms:

- 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, moist skin; heavy sweating; dizziness; nausea; fainting.
- 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 and death occur. Competent medical help must be obtained. Signs and symptoms are: red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 100 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest periods stay the same. If the pulse rate is 100 beats per minute at the beginning of the nest rest period, the following work cycle should be further shortened by 33%.
- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period remains the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the work cycle may be further shortened by 33%. Oral temperature should be measured at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No TurnKey-Benchmark employee will be permitted to continue wearing semi-permeable or impermeable garments when his/her oral temperature exceeds 100.6 degrees Fahrenheit.

10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frostnip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102 to 108 degrees Fahrenheit), and drinking a warm beverage. Do not rub skin to generate friction/ heat.

  2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish gray area of tissue which will be firm to the touch but will yield little pain. The treatment is identical for Frostnip.

  3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard and will yield little to no pain. Treatment is identical to that for Frostnip.

- **Hypothermia** is a serious cold stress condition occurring when the body loses heat at a rate faster than it is produced. If untreated, hypothermia may be fatal. The stages of hypothermia may not be clearly defined or visible at first, but generally include:

  1) Shivering
  2) Apathy (i.e., a change to an indifferent or uncaring mood)
  3) Unconsciousness
  4) Bodily freezing

Employees exhibiting signs of hypothermia should be treated by medical professionals. Steps that can be taken while awaiting help include:

1) Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)
2) Perform active re-warming with hot liquids for drinking (Note: do not give the victim any liquid containing alcohol or caffeine) and a warm water bath (102 to 108 degrees Fahrenheit).
3) Perform passive re-warming with a blanket or jacket wrapped around

the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Education of workers to recognize the symptoms of frostbite and hypothermia.
- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in heated areas, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if hypothermia has set in).
- For monitoring the body's recuperation from excess cold, oral temperature recordings should occur:
    - At the Site Safety Technicians discretion when suspicion is based on changes in a worker's performance or mental status.
    - At a workers request.
    - As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind chill less than 20 degrees Fahrenheit or wind chill less than 30 degrees Fahrenheit with precipitation).
    - As a screening measure whenever anyone worker on Site develops hypothermia.

Any person developing moderate hypothermia (a core body temperature of 92 degrees Fahrenheit) will not be allowed to return to work for 48 hours without the recommendation of a qualified medical doctor.

11.0 WORK ZONE AND SITE CONTROL

Work zones around the areas designated for investigation activities will be established by TurnKey-Benchmark on a daily basis and communicated to all employees and other Site users by the SSHO. It shall be the SSHO's responsibility to ensure that all Site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- Exclusion Zone ("Hot Zone") - The area where contaminated materials may be exposed, excavated, or handled and all areas where contaminated equipment or personnel may travel. The zone will be delineated by flagging tape. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.
- Contaminant Reduction Zone - The zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment, and samples must remain in the Contaminant Reduction Zone until decontaminated.
- Support Zone - The part of the Site that is considered non-contaminated or "clean." Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

In the absence of other task-specific work zone boundaries established by the SSHO, the following boundaries will apply to all investigation activities involving disruption or handling of Site soils, sediment, or groundwater:

- Exclusion Zone: 50 foot radius from the outer limit of the sampling activity.
- Contaminant Reduction Zone: 100 foot radius from the outer limit of the sampling activity.
- Support Zone: Areas outside the Contaminant Reduction Zone.

Access of non-essential personnel to the Exclusion and Contaminant Reduction Zones will be strictly controlled by TurnKey-Benchmark. Only personnel who are essential to the completion of the task will be allowed access to these areas and only if they are wearing the prescribed level of protection. Entrance of all personnel must be approved by the SSHO.

The Contractor will maintain a Health and Safety Logbook containing the names of workers and their level of protection. The zone boundaries may be changed by the SSHO as

environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

12.0 Decontamination

12.1 Decontamination for TurnKey-Benchmark Employees

The degree of decontamination required is a function of a particular task and the environment within which it occurs. The following decontamination procedure will remain flexible, thereby allowing the decontamination crew to respond appropriately to the changing environmental conditions which may arise at the Site. All TurnKey-Benchmark personnel on-site shall follow the procedure below.

Station 1 - Equipment Drop: Deposit visibly contaminated (if any) re-useable equipment used in the contamination reduction and exclusion zones (tools, containers, monitoring instruments, radios, clipboards, etc.) on plastic sheeting.

Station 2 - Boots and Gloves Wash and Rinse: Scrub outer boots and outer gloves. Deposit tape and gloves in waste disposal container.

Station 3 - Tape, Outer Boot, and Glove Removal: Remove tape, outer boots, and gloves. Deposit tape and gloves in waste disposal container.

Station 4 - Canister or Mask Change: If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot cover donned, and worker returns to duty.

Station 5 - Outer Garment/Face Piece Removal: Protective suit removed and deposited in separate container provided by Contractor. Face piece or goggles are removed if used. Avoid touching face with fingers. Face piece and/or goggles deposited on plastic sheet. Hard hat removed and placed on plastic sheet.

Station 6 - Inner Glove Removal: Inner gloves are the last personal protective equipment to be removed. Avoid touching the outside of the gloves with bare fingers. Dispose of these gloves in waste disposal container.

Following PPE removal, personnel shall wash hands, face, and forearms with absorbent wipes. If field activities proceed for a duration of 6 consecutive months or longer, shower facilities will be provided for worker use in accordance with OSHA 29 CFR 1910.120(n).

12.2 Decontamination For Medical Emergencies

In the event of a minor, non-life threatening injury, personnel should follow the decontamination procedures as defined, and then administer first-aid.

In the event of a major injury or other serious medical concern (e.g., heat stroke), immediate first-aid is to be administered and the victim transported to the hospital in lieu of further decontamination efforts unless exposure to a Site contaminant would be considered "Immediately Dangerous to Life or Health."

12.3 Decontamination Of Field Equipment

Decontamination of heavy equipment will be conducted by the subcontractor in accordance with his approved Health and Safety Plan in the Contamination Reduction Zone. As a minimum, this will include manually removing heavy soil clods, followed by high pressure water and detergent or steam cleaning.

Decontamination of all tools used for sample collection purposes will be conducted by TurnKey-Benchmark personnel. It is expected that all tools will be constructed of nonporous, nonabsorbent materials (i.e., metal) which will aid in the decontamination effort. Any tool or part of a tool made of porous, absorbent material (i.e., wood) will be placed into suitable containers and prepared for disposal.

13.0 CONFINED SPACE ENTRY

OSHA 29 CFR 1910.146 identifies a confined space as a space which is large enough and so configured that an employee can physically enter and do assigned work, has limited or restricted means for entry and exit, and is not intended for continuous employee occupancy. Confined spaces include, but are not limited to, trenches, storage tanks, process vessels, pits, sewers, tunnels, underground utility vaults, pipelines, sumps, wells, and excavations.

Confined space entry by TurnKey-Benchmark employees is not anticipated to be necessary to complete the Site investigation activities identified in Section 1.4. In the event that the scope of work changes or confined space entry appears necessary, the Project Manager will be consulted to determine if feasible engineering alternatives to confined space entry can be implemented. If confined space entry by TurnKey-Benchmark employees cannot be avoided through reasonable engineering measures, task-specific confined space entry procedures will be developed and a confined-space entry permit will be issued through TurnKey-Benchmark's corporate Health and Safety Director. TurnKey-Benchmark employees shall not enter a confined space without these procedures and permits in place.

14.0 FIRE PREVENTION AND PROTECTION

14.1 General Approach

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper Site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

14.2 Equipment and Requirements

Fire extinguishers will be provided by TurnKey-Benchmark and are required to be provided by the subcontractor on all heavy equipment brought on-site. Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary. Recharge or replacement shall be mandatory immediately after each use.

14.3 Flammable and Combustible Substances

All storage, handling, or use of flammable and combustible substances will be under the supervision of qualified persons. All tanks, containers and pumping equipment, whether portable or stationary, which are used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the National Fire Protection Association.

14.4 Hot Work

If the scope of work necessitates welding or blow torch operation, the hot work permit presented in Attachment 3 will be completed by the SSHO and reviewed/issued by the Project Manager.

15.0 EMERGENCY INFORMATION

In accordance with OSHA 29 CFR Part 1910, an Emergency Response Plan is attached to this HASP as Attachment 1.

16.0 REFERENCES

1. Nature's Way Environmental Consultants & Contractors, Inc. *Limited Environmental Investigation, 275 Franklin Street, Buffalo, NY*. September 15, 2004.

2. Benchmark Environmental Engineering & Science, PLLC. *Preliminary Site Investigation Letter Report, 275 & 277 Franklin Street and 470 Pearl Street parcels, Buffalo, NY*. March 10, 2006.

3. Benchmark Environmental Engineering & Science, PLLC. *Addendum to March 2006 Preliminary Site Investigation, 432 Pearl Street, Buffalo, NY*. June 26, 2006.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

CONSTITUENTS OF CONCERN & OBSERVED CONCENTRATIONS BY MEDIA [1]

Health and Safety Plan
275 Franklin Street & 432 Pearl Street Sites
Buffalo, New York

Parameter	Soil (mg/kg)	Soil Vapor (µg/m3)	Groundwater (µg/L)
Volatile Organic Compounds			
Tetrachloroethene	ND - 12.7	ND - 14,000	0.81 J - 5,600
Trichloroethene	ND - 0.014 J	ND - 70	0.71 J - 470 J
1,1,1-Trichloroethane	ND	ND - 71	ND

Parameter	Soil (mg/kg)	Soil Vapor (µg/m3)	Groundwater (µg/L)
Semi-Volatile Organic Compounds			
Benzo(a)anthracene	ND - 7.7 J	NA	NA
Benzo(b)fluoranthene	ND - 12	NA	NA
Benzo(k)fluoranthene	ND - 4.4 J	NA	NA
Benzo(a)pyrene	ND - 8.3	NA	NA
Chrysene	ND - 8.4 J	NA	NA
Dibenz(a,h)anthracene	ND - 1.3 J	NA	NA
Indeno(1,2,3-cd)pyrene	ND - 4.3 J	NA	NA
Inorganic Compounds			
Lead	3.8 J - 507	NA	NA
Mercury	ND - 1.1	NA	NA

Notes:

(1) Concentration ranges based on post-remedial data.

J = Estimated concentration
ND = Not detected
NA = Not analyzed

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2

TOXICITY AND EXPOSURE DATA FOR CONSTITUENTS OF CONCERN

Health and Safety Plan
275 Franklin Street & 432 Pearl Street Sites
Buffalo, New York

Constituents of Concern	Inhalation Hazard		IDLH
	PEL	TLV	
Volatile Organic Compounds (ppm):			
Tetrachloroethene	100	25	150, Ca
Trichloroethene	50	50	1000, Ca
1,1,1-Trichloroethane	350	350	700
Semi-Volatile Organic Compounds (ppm):			
Chrysene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA
Inorganic Compounds: (mg/m^3)			
Mercury	0.1	0.025	10
Lead	0.05	0.05	100

Notes:

PEL - Permissible Exposure Limit, established by OSHA, equals the maximium exposure concentration allowable for 8 hours per day @ 40 hours per week.

TLV - Threshold Limit Value, established by ACGIH, equals the maximum exposure concentration allowable for 8 hours per day @ 40 hours per week.

IDLH - Immediately Dangerous to Life or Health

Ca - NIOSH considers constituent to be a potential carcinogen.

ND - IDLH has not yet been established.

NA - Not Available. Exposure should be minimized to the extent feasible through appropriate engineering controls & PPE.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 3

POTENTIAL ROUTES OF EXPOSURE TO CONSTITUENTS OF CONCERN

Health and Safety Plan
275 Franklin Street & 432 Pearl Street Sites
Buffalo, New York

Activity	Direct Contact with Surface and Subsurface Soils	Direct Contact with Groundwater	Inhalation of Vapors or Dust
Subsurface Soil Borings & Sampling	X		X
Soil Vapor Sampling	X		X
Development and Sampling of Monitoring Wells		X	

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 4

REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE) LEVELS[1]

Health and Safety Plan
275 Franklin Street and 432 Pearl Street Sites
Buffalo, New York

Activity	Respiratory Protection[2]	Clothing	Gloves	Boots	Other Required PPE/Modifications[3]
Subsurface Soil Borings & Sampling	Level D; upgrade to Level C if necessary	Work Uniform or Tyvek	L	L outer, steel-toed safety boot inner	Hardhat, Safety glasses w/ side-shields
Soil Vapor Sampling	Level D; upgrade to Level C if necessary	Work Uniform or Tyvek	L	L outer, steel-toed safety boot inner	Safety glasses w/ side-shields
Development and Sampling of Monitoring Wells	Level D; upgrade to Level C if necessary	Work Uniform or Tyvek	L	L outer, steel-toed safety boot inner[3]	Safety glasses w/ side-shields

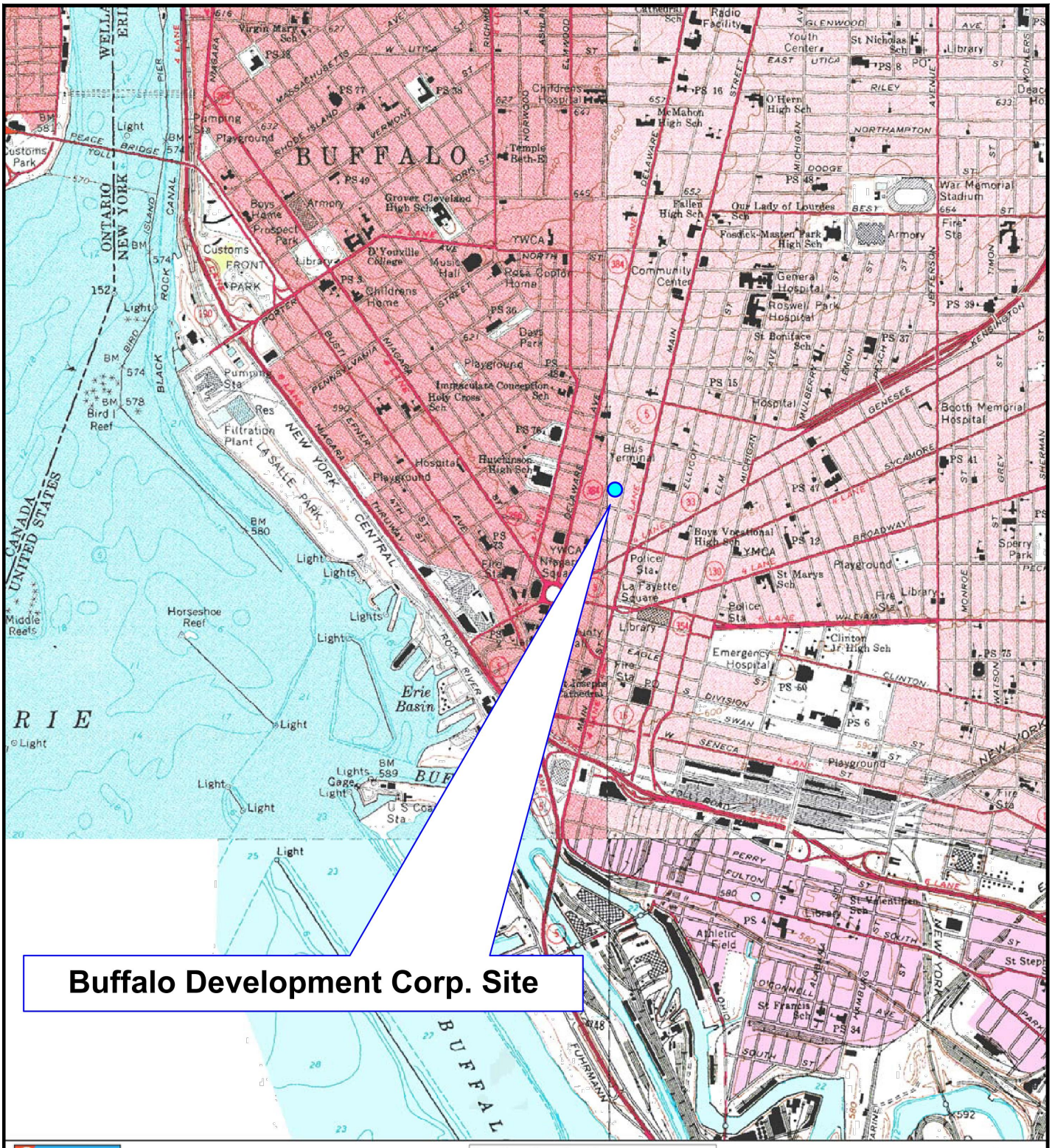
Notes:

1. T = Tyvek; L= Latex; N = Nitrile; S = Saranex
2. Respiratory equipment shall conform to guidelines presented in Section 8. The Level C requirement is an air-purifying respirator equipped with organic compound/acid gas/dust cartridge.
3. Dust masks shall be donned as directed by the site health and safety officer or site safety technician whenever potentially contaminated airborne particulates (i.e., dust) are present in significant amounts in the breathing zone. Goggles may be substituted with safety glasses w/side-shields whenever contact with contaminated liquids is not anticipated.

FIGURES

F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\APPENDIX C\Figure 1; Site Location and Vicinity Map.dwg

FIGURE 1



BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0156-016-002

DATE: MAY 2017

DRAFTED BY: CMC

SITE LOCATION AND VICINITY MAP

HEALTH AND SAFETY PLAN

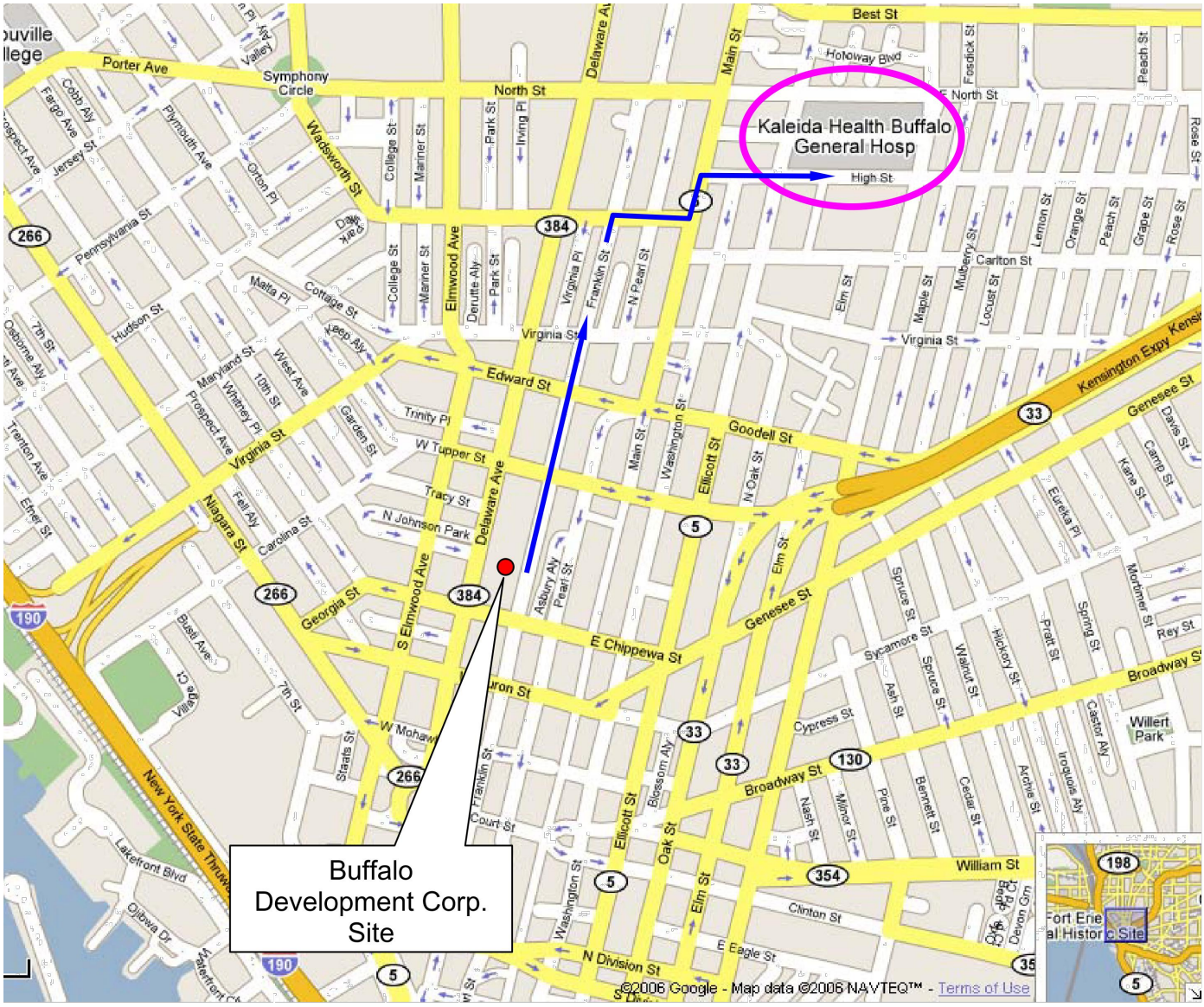
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK
BCP NO. C915208 & C915237

PREPARED FOR

BUFFALO DEVELOPMENT CORPORATION

F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\Site Management Plan\APPENDIX C\Figure C-1; Map of Route from Site to Hospital.dwg

FIGURE C-1



Kaleida Health: Buffalo General Hospital
100 High Street
Buffalo, New York 14203
(716) 859-5600

1. Leave site going north on Franklin Street.
2. Turn right on Wadsworth Street.
3. Turn left on Main Street.
4. Turn right on High Street, the hospital is on your left.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
726 EXCHANGE STREET
SUITE 624
BUFFALO, NEW YORK 14210
(716) 856-0599

PROJECT NO.: 0156-016-002
DATE: MAY 2017
DRAFTED BY: CMC

EMERGENCY HOSPITAL ROUTE MAP

EMERGENCY RESPONSE PLAN

275 FRANKLIN STREET & 432 PEARL STREET SITES
BCP NO. C915208 & C915237
BUFFALO, NEW YORK
PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

ATTACHMENT 1

EMERGENCY RESPONSE PLAN

ATTACHMENT 1

EMERGENCY RESPONSE PLAN

Personnel Exposure

- Skin Contact: Use copious amounts of soap and water. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide medical attention. Eyewash stations will be provided on site. If necessary, transport to Buffalo General Hospital.

- Inhalation: Move to fresh air and, if necessary, transport to Buffalo General Hospital.

- Ingestion: Decontaminate and transport to Buffalo General Hospital.

Personal Injury

Minor first-aid will be applied on-site as deemed necessary. In the event of a life threatening injury, the individual should be transported to Buffalo General Hospital via ambulance. The Site Safety and Health Officer (SSHO) and/or the subcontractor's Health and Safety Officer will supply available chemical specific information to appropriate medical personnel as requested.

First aid kits will conform to Red Cross and other applicable good health standards, and shall consist of a weatherproof container with individually sealed packages for each type of item. First aid kits will be fully equipped before being sent out on each job and will be checked weekly by the SSHO to ensure that the expended items are replaced.

Communications

Internal emergency communication systems are used to alert workers to danger, convey safety information, and maintain site control. Any effective system can be employed. Two-way radio headsets or field telephones are often used when work teams are far from the command post. Hand signals and air-horn blasts are also commonly

used. Every system must have a backup. It shall be the responsibility of the SSHO and/or the subcontractor's Health and Safety Officer to ensure that an adequate method of internal communication is understood by all personnel entering the site. Unless all personnel are otherwise informed, the following signals shall be used.

1) Emergency signals by portable air horn, siren, or whistle: two short blasts, personal injury; continuous blast, emergency requiring site excavation.

2) Visual signals: hand gripping throat, out of air/cannot breathe; hands on top of head, need assistance; thumbs up, affirmative/ everything is OK; thumbs down, no/negative; grip partner's wrist or waist, leave area immediately.

Evacuation

In the event that an area must be evacuated due to an emergency, such as a chemical spill or a fire, workers shall exit upwind, if possible. Since work conditions and work zones within the site may be changing on daily basis, it shall be the responsibility of the SSHO and/or the subcontractor's Health and Safety officer to review evacuation routes and procedures as necessary and to inform all site workers of any changes.

Adverse Weather Conditions

In the event of adverse weather conditions, the SSHO in conjunction with the subcontractor's Health and Safety Officer will determine if engineering operations can continue without sacrificing the health and safety of site personnel. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat/cold stress
- Inclement weather – related working conditions
- Limited visibility
- Potential for electrical storms

ATTACHMENT 1

EMERGENCY RESPONSE PLAN

Emergency Telephone Numbers

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE PROJECT & CORPORATE HEALTH AND SAFETY MANAGER: **Thomas H. Forbes, P.E.**

(716) 856-0599 (Work)
(716) 864-1730 (Mobile)

BENCHMARK SITE HEALTH AND SAFETY OFFICER: **Richard L. Dubisz**

(716) 998-4334 (Mobile)
(716) 856-0599 (Work)

BUFFALO GENERAL HOSPITAL (100 High Street)	(716) 859-5600
FIRE	911
AMBULANCE	911
CITY OF BUFFALO POLICE	911
STATE EMERGENCY RESPONSE HOTLINE	(800) 457-7362
NATIONAL RESPONSE HOTLINE	(800) 424-8802

NYSDEC
Regional Hazardous Waste Engineer
270 Michigan Street
Buffalo, New York 14203

NYSDOH
Public Health Specialist
Bureau of Environmental Exposure Investigation
584 Delaware Avenue
Buffalo, NY 14202

The Site location is: 275/277 & 279 Franklin, 267 Franklin, and 432 Pearl Streets
Buffalo, NY 14202

ATTACHMENT 1

EMERGENCY RESPONSE PLAN

Directions to Hospital

The following directions describe the best route to **Buffalo General Hospital** and Figure C-1 identifies the hospital route:

- Start out going NORTH on Franklin Street.
- Turn RIGHT on Wadsworth Street.
- Turn LEFT on Main Street.
- Turn RIGHT on High Street; **Buffalo General Hospital** is located on the left.
- Follow signs to Emergency Room.

Records and Reporting

It shall be the responsibility of each employer to establish and assure adequate records of all:

- Occupational injuries and illnesses.
- Accident investigations.
- Reports to insurance carrier or State compensation agencies.
- Reports required by client.
- Records/reports required by local, state, federal and/or international agencies.
- Property or equipment damage.
- Third party injury or damage claims.
- Environmental testing logs.
- Explosive and hazardous substances inventories and records.
- Records of inspections and citations.
- Related correspondence.
- Safety training.

ATTACHMENT 2

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

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^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

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

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

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

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

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

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

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

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

ATTACHMENT 3

HOT WORK PERMIT FORM

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

HOT WORK PERMIT

PART 1 - INFORMATION

Issue Date:	
Date Work to be Performed: Start:	Finish (permit terminated):
Performed By:	
Work Area:	
Object to be Worked On:	

PART 2 - APPROVAL

(for 1, 2 or 3: mark Yes, No or NA)*

Will working be on or in:	Finish (permit terminated):	
1. Metal partition, wall, ceiling covered by combustible material?	yes	no
2. Pipes, in contact with combustible material?	yes	no
3. Explosive area?	yes	no

* = If any of these conditions exist (marked "yes"), a permit will not be issued without being reviewed and approved by Thomas H. Forbes (Corporate Health and Safety Director). Required Signature below.

PART 3 - REQUIRED CONDITIONS**

(Check all conditions that must be met)

	PROTECTIVE ACTION		PROTECTIVE EQUIPMENT
	Specific Risk Assessment Required		Goggles/visor/welding screen
	Fire or spark barrier		Apron/fireproof clothing
	Cover hot surfaces		Welding gloves/gauntlets/other:
	Move movable fire hazards, specifically		Wellintons/Knee pads
	Erect screen on barrier		Ear protection: Ear muffs/Ear plugs
	Restrict Access		B.A.: SCBA/Long Breather
	Wet the ground		Respirator: Type:
	Ensure adequate ventilation		Cartridge:
	Provide adequate supports		Local Exhaust Ventilation
	Cover exposed drain/floor or wall cracks		Extinguisher/Fire blanket
	Fire watch (must remain on duty during duration of permit)		Personal flammable gas monitor
	Issue additional permit(s):		

Other precautions:

** Permit will not be issued until these conditions are met.

SIGNATURES

Orginating Employee:	Date:
Project Manager:	Date:
Part 2 Approval:	Date:

Prepared By: _____

APPENDIX D

MONITORING WELL & PIEZOMETER BORING & CONSTRUCTION LOGS

NATURE'S WAY
ENVIRONMENTAL CONSULTANTS & CONTRACTORS, INC.

CRITTENDEN
(716) 937-6527
SYRACUSE
(315) 635-9818

Hole Number: B 1

DATE: 9/07/04 ELEVATION:

PROJECT: Subsurface Investigation at the Property Located at
275 Franklin Street, Buffalo, New York

PREPARED FOR: Knoer, Crawford & Bender

BORING LOCATION: See Map

SN	0/6	6/12	12/18	18/24	N	OVM	LITH	DESCRIPTION AND CLASSIFICATION	REC	COMMENTS
1						0.0		Moist, dark gray and gray, gravelly (SILTY-SAND) fill with 15 to 30% gravel, very fine to fine size sand	1.8'	Sandy fill to 2.0 feet over water sorted and deposited sand with little silt to end of boring
2						0.0		2.5	1.8'	
								Moist, distinctly mottled, brown (SILTY-SAND) with very fine to fine size sand, little silt, thinly bedded		
3						0.0			2.0'	
								6.0		
4						0.0		Wet, faintly mottled, brown (SILTY-SAND) with very fine to fine size sand, little silt, thinly bedded	2.0'	
5						0.0			2.0'	
6						0.0			2.0'	
								12.0		
								Earthprobe Boring Completed at 12.0 feet		

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ENVIRONMENTAL CONSULTANTS & CONTRACTORS, INC.

CRITTENDEN
(716) 937-6527
SYRACUSE
(315) 635-9818

Hole Number: B 2

DATE: 9/07/04 ELEVATION:

PROJECT: Subsurface Investigation at the Property Located at 275 Franklin Street, Buffalo, New York

PREPARED FOR: Knoer, Crawford & Bender

BORING LOCATION: See Map

SN	0/6	6/12	12/18	18/24	N	OVM	LITH	DESCRIPTION AND CLASSIFICATION	REC	COMMENTS
1						0.0		Asphalt 0.3 Moist, dark gray to black, gravelly (SAND) fill with 20 to 40% gravel, cinders and red brick fragments	1.4'	Asphalt to 0.3 foot over sandy fill with some gravel, cinders and bricks to 4.5 feet over water sorted and deposited sand with little silt to end of boring
2						3.0			1.5'	
3						11.0		4.5 Moist becoming wet below 8.5 feet (SILTY-SAND) with very fine to fine size sand, little silt, thinly bedded	2.0'	
4						0.0			2.0'	
5						0.0			2.0'	
6						0.0		12.0 Earthprobe Boring Completed at 12.0 feet	2.0'	

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NATURE'S WAY
ENVIRONMENTAL CONSULTANTS & CONTRACTORS, INC.

CRITTENDEN
(716) 937-6527
SYRACUSE
(315) 635-9818

Hole Number: BMW 3

DATE: 9/07/04 ELEVATION:

PROJECT: Subsurface Investigation at the Property Located at 275 Franklin Street, Buffalo, New York

PREPARED FOR: Knoer, Crawford & Bender

BORING LOCATION: See Map

SN	0/6	6/12	12/18	18/24	N	OVM	LITH	DESCRIPTION AND CLASSIFICATION	REC	COMMENTS
1						0.0		Moist, dark brown, gravelly (SILTY-SAND) fill with 5 to 15% gravel, very fine to medium size sand, little silt (1.0)	1.7'	Sandy fill with little gravel and silt to 1.0 feet over sandy fill with trace gravel to 2.0 feet over sandy fill with brick to 4.0 feet over water sorted and deposited sand to end of boring
2						0.0		Moist, brown (SAND) with 3 to 5% gravel, very fine to fine size sand, trace silt (2.0)	1.8'	
								Moist, light brown (SAND) fill iwth brick cobbles and fragments (4.0)		
3						0.0		Moist, light brown (SAND) with very fine size sand, trace silt, thinly bedded (6.0)	1.4'	
4						0.0		Extremely moist to wet below 8.0 feet, brown (SAND) with very fine to fine size sand, little silt, thinly bedded	1.6'	
5						0.0			1.7'	
6						80.0			1.8'	
								Earthprobe Boring Completed at 12.0 feet (12.0)		

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ENVIRONMENTAL CONSULTANTS & CONTRACTORS, INC.

CRITTENDEN
(716) 937-6527
SYRACUSE
(315) 635-9818

Hole Number: B 4

DATE: 9/07/04 ELEVATION:

PROJECT: Subsurface Investigation at the Property Located at 275 Franklin Street, Buffalo, New York

PREPARED FOR: Knoer, Crawford & Bender

BORING LOCATION: See Map

SN	0/6	6/12	12/18	18/24	N	OVM	LITH	DESCRIPTION AND CLASSIFICATION	REC	COMMENTS
1						0.0		Black and dark brown (SILTY-SAND) fill with 5 to 15% gravel and occasional brick fragments	1.4'	Sandy fill with some gravel and brick to 2.0 feet over apparent water sorted and deposited sand with trace silt to 8.0 feet over water sorted and deposited sand with trace gravel and little silt to end of boring
								2.0		
2						0.0		Moist, light brown (SILTY-SAND) with very fine to fine size sand, trace silt, thinly bedded	1.6'	
3						0.0			1.8'	
								6.0		
4						0.0		Extremely moist to wet below 8.0 feet, brown (SILTY-SAND) with 3 to 5% gravel, very fine to fine size sand, little silt, thinly bedded	1.5'	
5						0.0			1.7'	
6						0.0			1.7'	
								12.0		
								Earthprobe Boring Completed at 12.0 feet		

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ENVIRONMENTAL CONSULTANTS & CONTRACTORS, INC.

CRITTENDEN
(716) 937-6527
SYRACUSE
(315) 635-9818

Hole Number: BMW 5

DATE: 9/07/04 ELEVATION:

PROJECT: Subsurface Investigation at the Property Located at 275 Franklin Street, Buffalo, New York

PREPARED FOR: Knoer, Crawford & Bender

BORING LOCATION: See Map

SN	0/6	6/12	12/18	18/24	N	OVM	LITH	DESCRIPTION AND CLASSIFICATION	REC	COMMENTS
1						8.0		Asphalt pavement 0.2 Moist, grayish brown and brown, gravelly (SILTY-SAND) fill with 20 to 40% gravel, and red brick fragments	1.4'	Asphalt pavement to 0.2 foot over sandy fill with some gravel and bricks to 4.5 feet over water sorted and deposited sand with litlte silt to end of boring
2						0.0			1.6'	
3						0.0		4.5	1.6'	
4						0.0		Moist becoming extremely moist below 7.5 feet (SILTY-SAND) with very fine size sand, little silt	1.7'	
5						0.0			1.8'	
6						82.0		12.0 Earthprobe Boring Completed at 12.0 feet	1.7'	

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ENVIRONMENTAL CONSULTANTS & CONTRACTORS, INC.

CRITTENDEN
(716) 937-6527
SYRACUSE
(315) 635-9818

Hole Number: B 6

DATE: 9/07/04 ELEVATION:

PROJECT: Subsurface Investigation at the Property Located at 275 Franklin Street, Buffalo, New York

PREPARED FOR: Knoer, Crawford & Bender

BORING LOCATION: See Map

SN	0/6	6/12	12/18	18/24	N	OVM	LITH	DESCRIPTION AND CLASSIFICATION	REC	COMMENTS
1						0.0		Moist, dark brown (SANDY-SILT) fill with little to some very fine size sand,	1.5'	Coarse silty fill to 1.5 fet over water sorted and deposited sand with little silt to end of boring
								1.5		
2						0.0		Moist, brown (SILTY-SAND) with very fine to fine size sand, weakly thinly bedded	1.5'	
3						0.0			2.0'	
4						0.0			2.0'	
								8.0		
5						0.0		Wet, brown (SILTY-SAND) with very fine to fine size sand, little silt, thinly bedded	2.0'	
6						0.0			2.0'	
								12.0		
								Earthprobe Boring Completed at 12.0 feet		

0 5 10 15 20

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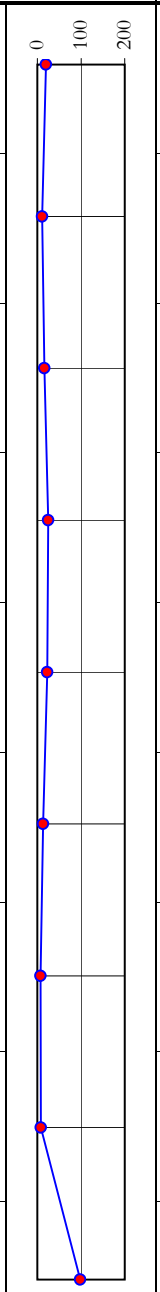
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE/MONITORING INSTALLATION LOG

Project Name: Buffalo Development Corp
BORING NUMBER: **MW-1**
Project Number: 0099-003-100
Location: 275-279 Franklin St
Client: Knoer Crawford & Bender, LLP
Start Date/Time: 11/27/2006 / 08:00 AM
Drilling Company: Earth Dimensions, Inc
End Date/Time: 11/28/2006 / 10:30 AM
Driller: Brian.B
Logged By: RLD
Helper: Harold
Drilling Method: Hollow Stem Auger
Rig Type: Truck Mounted CME
Weather: Pt Cloudy 55*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery (feet)	SAMPLE DESCRIPTION (USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
0	0	S1	2, 10, 10, 6	20	1.0	FILL, brick, fine gravel, wood debris, asphalt, dry, loose,	FILL	10.1	N	N	
-2	2	S2	4, 5, 6, 6	11	1.0	FILL, As above, some fine white sand, dry, loose	FILL	10.0	N	N	
-4	4	S3	20, 10, 6, 11	16	1.5	0-1' FILL, as above 1-2' Fine Tan/Brown SAND, loose, dry,	FILL/SP	455	N	N	
-6	6	S4	15, 12, 13, 16	25	1.5	Fine Tan/Brown SAND as above, loose, dry, Collected soil sample from 6-10' interval + blind duplicate	SP	1589	N	Y	
-8	8	S5	9, 12, 11, 11	23	1.5	Fine Tan/Brown SAND as above, trace red clay, wet	SP-SC	3000	N	Y	
-10	10	S6	6, 8, 5, 5	13	2.0	Fine Tan/Brown SAND as above, uniformly graded, trace red clay, wet	SP-SC	200 @10' / <10 @12'	N	N	
-12	12	S7	6, 3, 4, 7	7	2.0	0-1.5' Fine Tan/Brown SAND as above, 1.5-2' Medium Grey/Brown SAND, soft, wet	SP	0.0	N	N	
-14	14	S8	2, 4, 4, 7	8	2.0	Medium Grey/Brown SAND as above	SP	0.0	N	N	
-16	16	S9	17, 28, 70	98	2.0	Medium Grey/Brown SAND as above	SP	0.0	N	N	
-18	18										



Well Construction Details: concrete; curbbox; seal; 2" Sch. 40 PVC riser

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

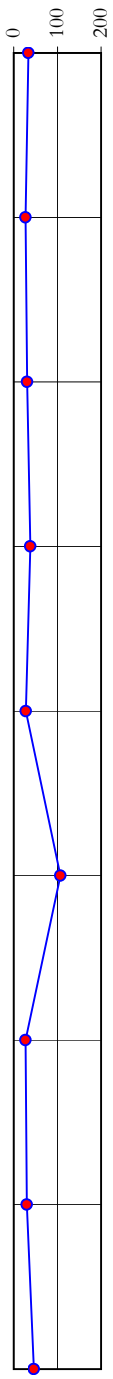
FIELD BOREHOLE/MONITORING INSTALLATION LOG

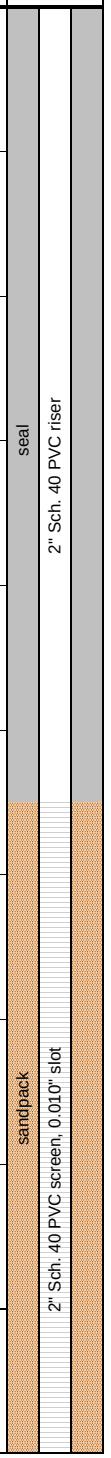
Project Name: Buffalo Development Corp **BORING NUMBER:** **MW-1**

Project Number: 0099-003-100 **Location:** 275-279 Franklin St

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery (feet)	SAMPLE DESCRIPTION (USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
-18	18	S1	5, 14, 20, 22	34	2.0	Medium Grey/Brown SAND as above	SP	O	N	N	
-20	20	S2	5, 16, 11, 11	27	1.5	Medium to coarse grey/brown SAND, with fine subrounded gravel, well graded, loose, wet	SW	0.0	N	N	
-22	22	S3	11, 13, 18, 21	31	1.5	Well graded fine to coarse SAND, with fine subrounded gravel up to 3/4" diameter, loose, wet	SW	0.0	N	N	
-24	24	S4	11, 15, 23, 22	38	1.5	Well graded fine to medium grey/brown SAND, wet	SW	0.0	N	N	
-26	26	S5	6, 9, 19, 44	28	2.0	Well graded fine to medium grey/brown SAND as above, some subrounded gravel, wet, loose	SW	0.0	N	N	
-28	28	S6	3, 23, 84, 100	107	2.0	Well graded fine to medium grey/brown SAND as above, wet	SW	0.0	N	N	
-30	30	S7	8, 13, 14, 31	27	2.0	Well graded fine to medium grey/brown SAND as above, wet	SW	0.0	N	N	
-32	32	S8	6, 10, 20, 20	30	2.0	Fine grain grey/brown SAND, with trace of silty clay, poorly graded, soft, wet	SP-SC	0.0	N	N	
-34	34	S9	2, 5, 11, 18	16	2.0	Fine grain grey/brown SAND as above, poorly graded, soft, wet	SP	0.0	N	N	
-36	36	S10	5, 13, 33, 100	46	1.5	Fine grain grey/brown SAND as above, poorly graded, soft, wet	SP	0.0	N	N	
-38	38										





BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

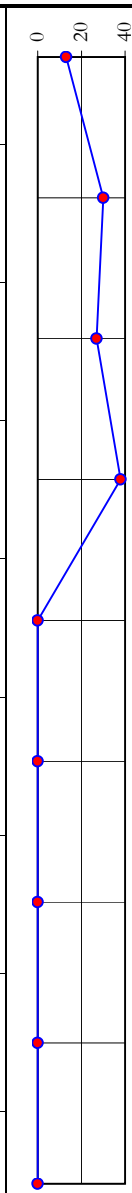
FIELD BOREHOLE/MONITORING INSTALLATION LOG

Project Name: Buffalo Development Corp **BORING NUMBER:** **MW-1**

Project Number: 0099-003-100 **Location:** 275-279 Franklin St

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery (feet)	SAMPLE DESCRIPTION (USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
-38	38	S1	2, 5, 8, 10	13	2.0	Fine grain grey/brown SAND as above, poorly graded, soft, wet	SP	0.0	N	N		
-40	40	S2	3, 10, 20, 27	30	2.0	Fine grain grey/brown SAND as above, poorly graded, soft, wet	SP	0.0	N	N		
-42	42	S3	4, 8, 19, 74	27	2.0	Fine grain grey/brown SAND as above, poorly graded, soft, wet	SP	0.0	N	N		
-44	44	S4	8, 14, 24, 36	38	2.0	Fine grain grey/brown SAND as above, poorly graded, soft, wet	SP	0.0	N	N		
-46	46	S5		0		*Augered to 52.5'*						
-48	48	S6		0								
-50	50	S7		0								
-52	52	S8		0		*Auger and Split spoon sample refusal at 52.5'. Pulled augers to 38', check boring depth in morning. Depth of boring at 39'. Set bottom of well at 39' with 10' of slotted screen.*						
-54	54	S9		0								
-56	56											



MONITORING WELL GROUTING:

Volume of cement/bentonite grout required:	V = pr2 x 7.48 =	62.0 gallons	borehole depth =	39.0 feet
Volume of cement/bentonite grout installed:		60.0 gallons	borehole diameter =	0.52 feet
Has bridging of grout occurred?	☐ yes ☑ no		borehole radius =	0.26 feet
If yes, explain resolution:				
Method of installation:	tremie grouted from bottom to top of borehole			

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE/MONITORING INSTALLATION LOG

Project Name: Buffalo Development Corp
BORING NUMBER: **MW-2**
Project Number: 0099-003-100
Location: 432 Pearl St
Client: Knoer Crawford & Bender, LLP
Start Date/Time: 11/28/2006 / 11:00 AM
Drilling Company: Earth Dimensions, Inc
End Date/Time: 11/28/2006 / 04:00 PM
Driller: Brian.B
Logged By: RLD
Helper: Harold
Drilling Method: Hollow Stem Auger
Rig Type: Truck Mounted CME
Weather: Pt Cloudy 55*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery (feet)	SAMPLE DESCRIPTION (USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
0	0	S1	6, 3, 22	25	1.5	FILL, brick, fine gravel, fine gravel, asphalt, dry, loose,	FILL	0.0	N	N		concrete / curbbox
-2	2	S2	22, 9, 14, 15	23	2.0	Trace Fill material, Fine brown/tan SAND with silty lense at 3', slightly moist, loose	FILL/SP-SM	0.0	N	N		
-4	4	S3	8, 7, 10, 13	17	1.6	Fine brown/tan SAND, poorly graded, thinly bedded , dry, loose	SP	0.0	N	N		
-6	6	S4	22, 18, 24, 21	42	1.5	Fine brown/tan SAND as above, loose, dry,	SP	0.0	N	N		
-8	8	S5	19, 15, 14, 16	29	1.5	Fine brown/tan SAND as above, loose, moist at 10'	SP	0.0	N	N		seal
-10	10	S6	24, 13, 15, 17	28	1.5	Fine Tan/Brown SAND as above, with some medium sand, wet	SP	0.0	N	N		2" Sch. 40 PVC riser
-12	12	S7	10, 20, 21, 14	41	1.0	Fine brown/grey SAND, poorly graded, wet	SP	0.0	N	N		
-14	14	S8	4, 8, 10, 15	18	2.0	Fine brown/grey SAND, as above poorly graded, wet	SP	0.0	N	N		
-16	16	S9		0		Augered to 18', split spoon sample from 18'-20'						
-18	18											

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE/MONITORING INSTALLATION LOG

Project Name: Buffalo Development Corp **BORING NUMBER:** **MW-2**

Project Number: 0099-003-100 **Location:** 275-279 Franklin St

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery (feet)	SAMPLE DESCRIPTION USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
-18	18	S1	9 17 17 24	34	2.0	Fine brown/tan SAND, with silty clay lense from 19.5'- 20', soft, wet	SP-SM	0.0	N	N	
-20	20	S2		0		Augered to 23', split spoon sample from 23'-25'					
-23	23	S3	14 15 15 18	30	2.0	0-1.6' Fine brown SAND, trace silt, poorly graded, 1.6'-2.0' increasing medium sand, uniformly graded, thinly bedded, wet	SW	0.0	N	N	
-25	25	S4		0		Augered to 28', split spoon sample from 28'-30'					
-28	28	S5	8 10 15 28	25	1.5	Well graded fine to medium grey/brown SAND, trace fine gravel, wet, loose	SW	0.0	N	N	
-30	30	S6		0		Augered to 33', split spoon sample from 33'-35'					
-33	33	S7	6 6 21 29	27	1.6	Fine grey/brown SAND, poorly graded, thinly bedded, loose, wet	SP	0.0	N	N	
-35	35	S8		0		Augered to 38', split spoon sample from 38'-40'					
-38	38	S9	4 10 31 45	41	2.0	0-0.6' Fine Brown/tan SAND as above, 0.6'-1.3' Red sandy CLAY, dense, stiff, medium plasticity, 1.3'-2.0' Fine brown SAND, trace clay, wet	CL/SP	0.0	N	N	
-40	40	S10	5 13 33 100	46	1.5	Augered and set well at 40'					
-42	42										

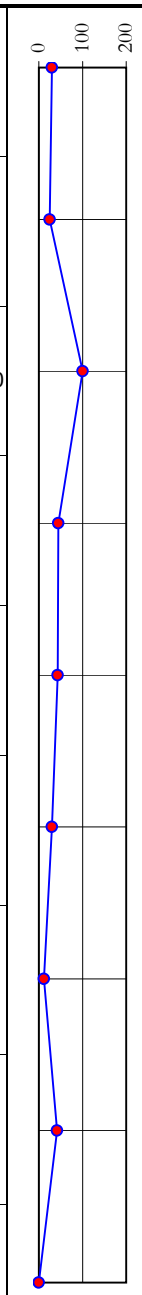
Well Construction Details: seal; 2" Sch. 40 PVC riser; sandpack; 2" Sch. 40 PVC screen, 0.010" slot

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE/MONITORING INSTALLATION LOG

Project Name: Buffalo Development Corp
BORING NUMBER: **MW-3**
Project Number: 0099-003-100
Location: 275-279 Franklin St
Client: Knoer Crawford & Bender, LLP
Start Date/Time: 11/29/2006 / 09:30 AM
Drilling Company: Earth Dimensions, Inc
End Date/Time: 11/29/2006 / 04:00 PM
Driller: Brian.B
Logged By: RLD
Helper: Harold
Drilling Method: Hollow Stem Auger
Rig Type: Truck Mounted CME
Weather: Pt Cloudy 60*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery (feet)	SAMPLE DESCRIPTION USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)
0	0	S1	10 12 18	30	1.0	FILL, brick, fine gravel, fine gravel, asphalt, dry, loose,	FILL	0.0	N	N	
-2	2	S2	19 15 10 53	25	1.0	Fill material, brick, white sand, fine gravel	FILL/SW	0.0	N	N	
-4	4	S3	68 100 0 0	100	1.0	Fill material, brick, white sand, fine gravel, as above	FILL/SW	0.0	N	N	
-6	6	S4	18 20 25 62	45	1.5	Fine brown/tan SAND w/ some silt at 8', moist at 8'	SW-SM	0.0	N	Y	
-8	8	S5	18 21 22 36	43	2.0	Fine brown silty SAND, loose, poorly graded, wet at 9'	SW-SM	0.0	N	N	
-10	10	S6	29 16 14 13	30	2.0	Fine Tan/Brown SAND, very soft, wet, trace medium and coarse sand at 12'.	SW	0.0	N	N	
-12	12	S7	8 6 6 9	12	2.0	Fine to medium brown/grey SAND, uniformly graded, loose,wet	SW	0.0	N	N	
-14	14	S8	15 17 25 20	42	<0.5	Fine brown SAND as above	SW	0.0	N	N	
-16	16	S9		0		*Augered to 18', split spoon sample from 18'-20'*					
-18	18										



Well Construction Details: concrete; curbbox; seal; 2" Sch. 40 PVC riser

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

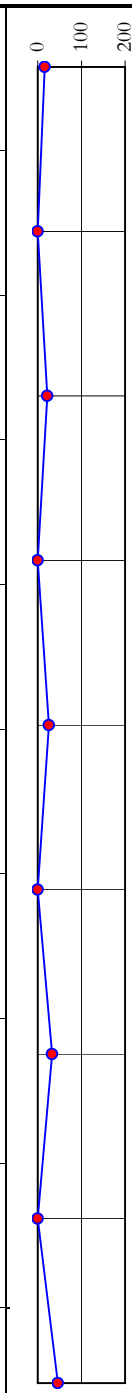
FIELD BOREHOLE/MONITORING INSTALLATION LOG

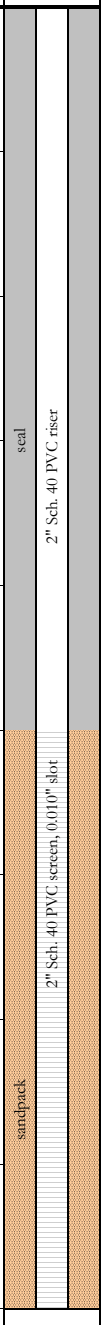
Project Name: Buffalo Development Corp **BORING NUMBER:** **MW-3**

Project Number: 0099-003-100 **Location:** 275-279 Franklin St

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery (feet)	SAMPLE DESCRIPTION USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type (<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
-18	18	S1	8 8 8 19	16	1.5	Fine to coarse brown/grey SAND, well graded, loose, wet	SW	0.0	N	N	
-20	20	S2		0		*Augered to 23', split spoon sample from 23'-25'*					
-23	23	S3	9 10 12 15	22	1.5	Fine to medium brown/grey SAND, as above, well graded, loose, wet	SW	0.0	N	N	
-25	25	S4		0		*Augered to 28', split spoon sample from 28'-30'*					
-28	28	S5	10 11 15 12	26	1.8	Fine to medium brown/grey SAND, as above, well graded, loose, wet, increasing clay fines at 1.7'	SW	0.0	N	N	
-30	30	S6		0		*Augered to 33', split spoon sample from 33'-35'*					
-33	33	S7	18 14 19 30	33	1.5	Fine brown/grey SAND, poorly graded, thinly bedded, soft, wet	SP	0.0	N	N	
-35	35	S8		0		*Augered to 38', split spoon sample from 38'-40'*					
-38	38	S9	9 12 34 47	46	1.5	0-0.6' Fine Brown/grey SAND as above, 0.6'-1.0' Red sandy CLAY, soft, medium plasticity, 1.0'-1.5' Fine brown/grey SAND, wet, loose	SP/CL	0.0	N	N	
-40	40	S10	5 13 33 100	46	1.5	*Augered and set well at 40'*					
-42	42										





Project No: 0156-001-700

Borehole Number: MW - 4

Project: 275-277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

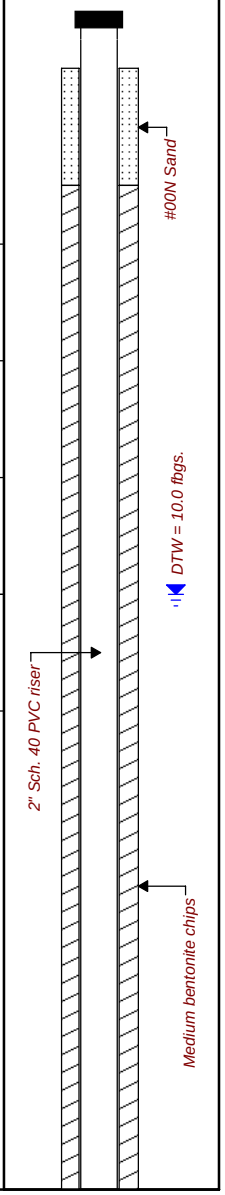
Site Location: 275-277 Franklin Street

Checked By: BCH

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							
	0.0	***Asphalt***							
		Fill Medium Brown, moist, fill, fine sand with fine gravel with some silt with red brick fragments, loose when disturbed (LWD), medium dense.	1	0	0.0		0.0		
	-2.2 / 2.2	Granite Cobble.							
		Fine Sand Tan/ light brown, moist, fine sand, with few silt, medium dense, loose when disturbed.	2	26	1.4		56.4		
	-4.0 / 4.0	As above with trace coarse gravel.							
5.0	-5.0 / 5.0	As above, more grey color with trace silt no coarse gravel	3	18	1.5		122.0	TCL 8260 VOC	
	-6.0 / 6.0	As above.	4	18	1.6		33.4		
	-8.0 / 8.0	As above, moist to wet, slightly laminated, slow dilatancy	5	23	2.0		388.0	TCL 8260 VOC	
	-9.5 / 9.5	***Silty Clay*** Reddish brown, moist, silty clay, with some fine sand, stiff.							
10.0	-10.0 / 10.0	***Fine Sand*** Brown, wet, fine sand, with trace fine gravel and coarse sand, little silt, slightly laminated, rapid dilatancy, medium dense.	6	16	1.5		37.9	TCL 8260 VOC	
	-12.0 / 12.0	As above.	7	14	1.9		67.3		
	-14.0 / 14.0	As Above, with few silt, no laminations	8	14	1.4		9.4		
15.0	-16.0 / 16.0	As above, no fine gravel and trace silt.	9	25	1.3		20.3		
	-18.0 / 18.0	As above.	10	18	1.3		3.2		
20.0	-20.0 / 20.0						3.6		



Drilled By: Earth Dimensions
Drill Rig Type: Diedrich D120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/14/08 - 4/15/08

Hole Size: 9-inch
Stick-up: Flush Mount
Datum: Site Datum

Sheet: 1 of 3

Project No: 0156-001-700

Borehole Number: MW - 4

Project: 275-277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 250 / 500)	Lab Sample	Well Completion Details or Remarks
		As above.	11	22	1.4		3.6, 4.1		
	-22.0 22.0	As Above.	12	20	1.8		164.0		
	-23.0 23.0 -23.5 23.5	***Silty Clay*** Reddish brown, moist, silty clay, with some fine sand, stiff.							
	-24.0 24.0	***Fine Sand*** Brown, wet, fine sand, with trace gravel and coarse sand, little silt, rapid dilatancy, medium dense.							
25.0		As above, with some medium and coarse sands, with few fine gravel.	13	16	1.2		1.7		
	-26.0 26.0	As above.	14	21	1.6		1.2		
	-28.0 28.0	As above with trace fine gravel.	15	90	1.4		1.7		
30.0	-30.0 30.0	As above.	16	25	1.2		1.7		
	-32.0 32.0	As above.	17	24	1.7		1.2		
	-33.0 33.0 -34.0	***Silty Clay*** Reddish brown, moist, silty clay, with some fine sand, stiff.							
35.0	34.0	***Fine Sand*** Dark grey, wet, fine sand, with trace silt and trace fine gravel, rapid dilatancy, with orange staining at 36.5 fbgs, loose.	18	6	0.8		0.5		
	-36.0 36.0	As above.	19	12	1.2		0.4		
	-37.0 37.0 -38.0	Grey Brown, wet, fine sand with some medium sand, medium dense, loose when disturbed.							
	38.0	As above with trace fine gravel.	20	72	0.5		1.2, 1.9		
40.0	-40.0 40.0								

Well Completion Details: *2" Sch 40 PVC riser*; *Medium bentonite chips*; *2" Sch 40 PVC 0.010 slot screen*; *#00N sandpack*

Drilled By: Earth Dimensions
Drill Rig Type: Diedrich D120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/14/08 - 4/15/08

Hole Size: 9-inch
Stick-up: Flush Mount
Datum: Site Datum

Sheet: 2 of 3

Project No: 0156-001-700

Borehole Number: MW - 4

Project: 275-277 Franklin Street Investigation

Client: Buffalo Development Corporation

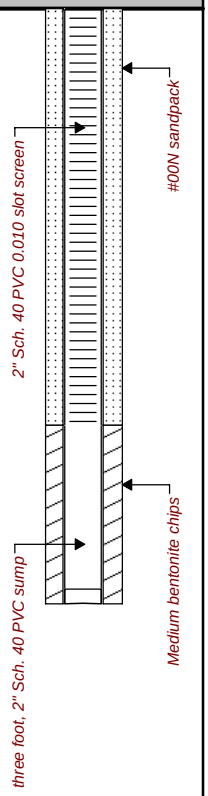
Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 250 / 500)	Lab Sample	Well Completion Details or Remarks
		As above trace coarse gravel.					1.9		
	-41.0 / 41.0	***Silty Clay*** Reddish brown, moist, silty clay, with some fine sand, stiff.	21	42	1.1		2.5		
	-42.0 / 42.0	***Fine Sand*** Brown grey, wet, fine sand, with trace coarse sand, very dense	22	52	1.0		29.7		
	-44.0 / 44.0	As Above.							
	-44.5 / 44.5	***Silty Clay*** Reddish brown, wet, silty clay with sand and some fine gravel, firm.	23	85	1.3		10.6		
45.0	-46.0 / 46.0	***Sandy Silt*** Reddish brown moist, sandy silt (till), with reddish brown silty clay filled fractures horizontial, stiff.	24	81	1.5		0.7		
	-48.0 / 48.0	As above, with few coarse sands, with veiny grey fine sand filled fractures, blocky.	25	52	1.1		0.6		
50.0	-50.0 / 50.0	As above, with no fine sand filled fractures.	26	44	1.0		0.0		
	-52.0 / 52.0	As above, top of rock 52.2 fbgs	27	100	0.2				
		End of Borehole		.2					
55.0									
60.0									



Drilled By: Earth Dimensions
Drill Rig Type: Diedrich D120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/14/08 - 4/15/08

Hole Size: 9-inch
Stick-up: Flush Mount
Datum: Site Datum

Sheet: 3 of 3

Project No: 0156-001-102

Borehole Number: MW - 5

Project: 275-277 Franklin Strteet Investigation

Client: Buffalo Development Corporation

Logged By: TAB

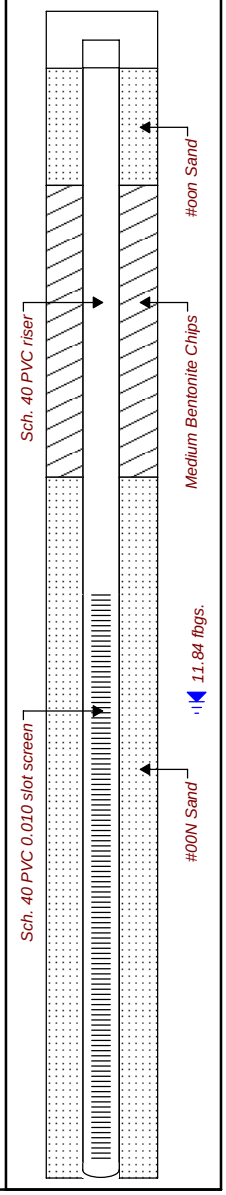
Site Location: 275-277 Franklin Street

Checked By: BCH

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 50 – 100)	Lab Sample	Well Completion Details or Remarks
0.0	0.0 / 0.0	Ground Surface ***Augered to 20.0 fbgs*** For Detailed soil descriptions see borehole log MW-4 (0.0-20.0 fbgs)							
5.0									
10.0									
15.0									
20.0									



Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA

Drill Date(s): 4/15/08

Hole Size: 9-inch
Stick-up: Flush Mount
Datum: Site Datum

Sheet: 1 of 1

Project No: 0156-001-700

Borehole Number: MW - 6

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

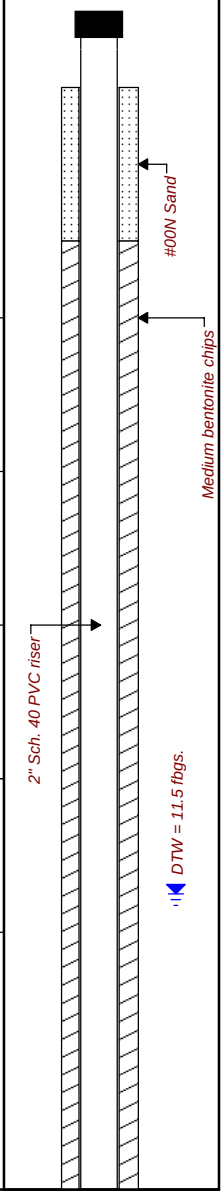
Logged By: TAB

Site Location: 275 - 277 Franklin St.

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 5000 / 10000)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							
	0.0 / -0.4	***Asphalt***							
	0.4	***Fill*** Dark brown, moist, fill, silt with some fine sand and coarse sand, with some fine gravel, medium dense, loose when disturbed.	1	0	0.0		0.0		
	-2.0 / 2.0	***Fine Sand*** Medium brown, moist, fine sand with few silt, loose, loose when disturbed	2	7	1.6		35.7		
	-4.0 / 4.0	As above, but with trace fine gravel, with iron banding.	3	5	1.8		570.0	TCL 8260 VOC	
5.0	-6.0 / 6.0	As above, with trace fine gravel, medium dense, with no iron banding.	4	10	1.0		453.0		
	-8.0 / 8.0	As above.	5	27	1.6		9999.0	TCL 8260 VOC	
10.0	-10.0 / 10.0	As above.	6	14	1.6		8192.0	TCL 8260 VOC	
	-11.5 / 11.5	As above, but wet,slow dilatancy,with very faint laminations.							
	-12.0 / 12.0	As above, with rapid dilatancy.	7	10	1.2		115.0		
	-14.0 / 14.0	As above.	8	9	1.4		10.4 / 9.6		
15.0									



Drilled By: Earth Dimensions
Drill Rig Type: Diedrich D120
Drill Method: 4.2-inch HSA, 2" ss and HQ core barrel

Drill Date(s): 4/16/08 - 4/17/08

Hole Size: 9 inch
Stick-up: Flush Mount
Datum: Site Datum

Sheet: 1 of 4

Project No: 0156-001-700

Borehole Number: MW - 6

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275 - 277 Franklin St.

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
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Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 5000 / 10000)	Lab Sample	Well Completion Details or Remarks
	-16.0 / 16.0	As above.	9	34	1.1		9.6; 2.0		
	-18.0 / 18.0	As Above, with iron banding, no laminations, coarse gravel in shoe.	10	22	0.9		1.2		
20.0	-20.0 / 20.0	As above, with few fine gravel, with no iron banding.	11	13	0.6		3.9		
	-22.0 / 22.0	As above, with trace fine gravel	12	20	1.1		1.4		
25.0	-24.0 / 24.0	As above.	13	14	1.1		1.6		
	-26.0 / 26.0	As above.	14	20	1.5		1.6		
	-28.0 / 28.0	As above, with some coarse sand and some fine gravel, trace silt.	15	12	1.1		1.4		
30.0	-30.0 / 30.0	As above, with some silt with trace fine sand and coarse gravel, slightly laminated.					1.7		2" Sch. 40 PVC riser; Medium bentonite chips

Drilled By: Earth Dimensions
Drill Rig Type: Diedrich D120
Drill Method: 4.2-inch HSA, 2" ss and HQ core barrel

Drill Date(s): 4/16/08 - 4/17/08

Hole Size: 9 inch
Stick-up: Flush Mount
Datum: Site Datum

Project No: 0156-001-700

Borehole Number: MW - 6

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275 - 277 Franklin St.

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 5000 / 10000)	Lab Sample	Well Completion Details or Remarks
	-31.5 / 31.5	***Silty Clay*** Reddish brown, wet silty clay, with trace fine sand, and little coarse sand, slight laminations.	16	7	1.4		1.7, 1.9		
	-32.0 / 32.0	***Fine Sand*** Brown, wet, fine sand, with trace fine gravel, loose.	17	WR	0.6		2.2		
	-34.0 / 34.0	As above, with few silt, and trace coarse sand, with iron staining, medium dense.	18	10	1.0		1.4		
35.0	-36.0 / 36.0	As above, with no iron staining.	19	18	1.3		0.9		
	-38.0 / 38.0	As above.	20	6	1.5		1.0		
40.0	-40.0 / 40.0	As above, with trace silt, very dense.	21	74	1.5		60.3		
	-42.0 / 42.0	***Silty Clay*** Reddish brown, moist, silty clay, with some fine sand, stiff.							
	-42.5 / 42.5	***Fine Sand*** Brown, wet, fine sand with few silt, and trace coarse sand, medium dense.	22	50	0.7		5.7		
	-44.0 / 44.0	As above.							
45.0			23	61	1.5		1.9, 1.9		2" Sch 40 PVC riser; 2" Sch. 40 PVC 0.010 slot screen; #00N sandpack

Drilled By: Earth Dimensions
Drill Rig Type: Diedrich D120
Drill Method: 4.2-inch HSA, 2" ss and HQ core barrel

Drill Date(s): 4/16/08 - 4/17/08

Hole Size: 9 inch
Stick-up: Flush Mount
Datum: Site Datum

Sheet: 3 of 4

Project No: 0156-001-700

Borehole Number: MW - 6

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

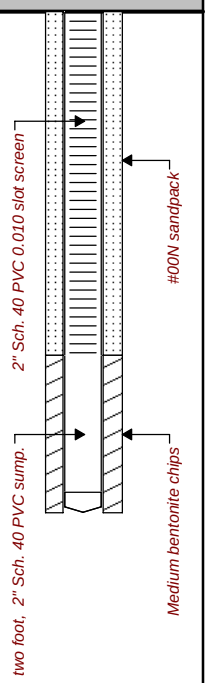
Logged By: TAB

Site Location: 275 - 277 Franklin St.

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm 0 5000 10000	Lab Sample	Well Completion Details or Remarks
	-46.0						1.9		
	46.0	As above.		100 .4					
			24		1.7		1.8		
	-48.0								
	48.0	As above.							
	-49.0						0.5		
	49.0	***Silty Clay*** Reddish brown, wet, silty clay, with trace fine sand, with little coarse sand, soft.	25	26	0.6				
	-50.0								
50.0	50.0	As above. ***Sandy Silt*** Reddish brown, wet, sandy silt, with few fine gravels, soft.	26	61	0.5		0.9		
	-52.0								
	52.0	Augered to bedrock at 52.5							
	-52.5								
	52.5	***Limestone*** Onandaga Limestone, dark blue grey, strong, fossiliferous, thickly bedded, moderatly disentigrated, Blocky, Fracture density;0.4', 0.75', 1.4 - 2.05' (fractured zone), 2.3', 2.9', 3.1', 3.85', 4.6', 4.9,' vertical fractures; 0.2', 1.4'. Recovery (feet) 5.8/6.0 = 96% RQD = 4.3/5.8 = 79% good.	Run #1						
55.0									
	-58.5								
	58.5	End of Borehole							
60.0									



Drilled By: Earth Dimensions
Drill Rig Type: Diedrich D120
Drill Method: 4.2-inch HSA, 2" ss and HQ core barrel

Drill Date(s): 4/16/08 - 4/17/08

Hole Size: 9 inch
Stick-up: Flush Mount
Datum: Site Datum

Sheet: 4 of 4

Project No: 0156-001-102

Borehole Number: MW - 7

Project: 275 Franklin Street Investigation

A.K.A.:

Client: Buffalo Development Corporation

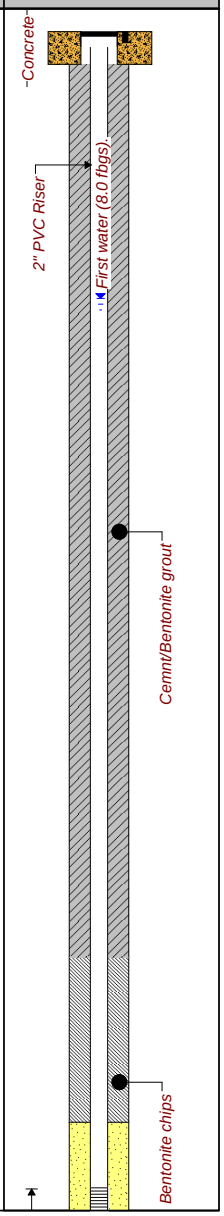
Logged By: TAB

Site Location: 275 Franklin St., Buffalo, NY.

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample
0.0	498.0 / 0.0	Ground Surface						
	0.0	***Asphalt***	1	0	0.0		0.0	
		Poorly Graded Sand with Fill Dark brown, moist, mostly fine sand, few non-plastic fines, few fine gravels, lose, orange brick.	2	8	0.5		0.0	
	494.0 / 4.0		3	10	1.0		2.0	
5.0		***Poorly Graded Sand*** As above, no fill.	4	16	0.4		0.0	
	492.0 / 6.0	As above, no gravel.	5	29	1.6		0.0	
	490.0 / 8.0	As above, wet (8.0 fbgs).	6	25	1.7		0.0	
10.0	488.0 / 10.0	Began standard sampling (Augered to 13.0 fbgs.)						
	485.0 / 13.0	Brown, wet, mostly medium fine sand, trace non-plastic fines, medium dense, loose when disturbed, rapid dilatancey. (Augered to 18.0 fbgs.)	7	15	1.7		0.0	
15.0	483.0 / 15.0							
	480.0 / 18.0	As above, trace fine gravel. (Augered to 23.0 fbgs.)	8	56	2.0		0.0	
20.0	478.0 / 20.0							
	475.0 / 23.0	As Above. (Augered to 28.0 fbgs.)	9	11	0.8		0.0	
25.0	473.0 / 25.0							
	470.0 / 28.0	As above, mostly fine sand, no fine gravel	10	9	2.0		7.2	
	469.0 / 29.0	***Sandy Lean Clay*** Reddish brown, wet, mostly medium plastic fines, some fine sand, trace fine gravel, soft, medium dry strength, medium toughness. (Augered to 33.0 fbgs.)						
30.0	468.0 / 30.0							
	465.0 / 33.0		11	33	1.7		0.0	
35.0							0.0	



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Diedrich D120
Drill Method: 4.2-inch HSA, 2" ss
Comments:
Drill Date(s): 5/30/12

Hole Size: 8 inch
Stick-up: Flush Mount
Datum: Site Datum of 500 fmsl.

Sheet: 1 of 2

Project No: 0156-001-102

Borehole Number: MW - 7

Project: 275 Franklin Street Investigation

A.K.A.:

Client: Buffalo Development Corporation

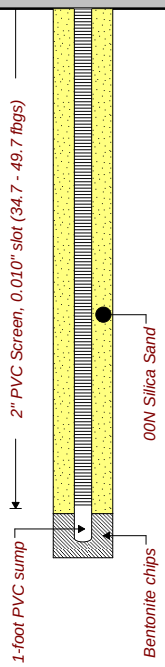
Logged By: TAB

Site Location: 275 Franklin St., Buffalo, NY.

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample
	460.0	***Poorly Graded Sand*** Brown, wet, mostly fine sand, trace non-plastic fines, dense, loose when disturbed, rapid dilatancey. (Augered to 38.0 fbgs.)					0.0	
	38.0 459.0	As above.	12	NA	2.0		0.0	
	39.0 458.0	As above.						
40.0	40.0	***Silty Sand*** Reddish brown, wet, mostly fine sand, little non-plastic fines, hard, low toughness, no dry strength, slow dilatancey.	13	39	2.0		0.0	
	456.0 42.0	***Poorly Graded Sand*** As above (33.0 - 35.0 fbgs).	14	44	1.8		0.0	
	454.0 44.0	As above.	15	83	1.8		0.0	
45.0	452.0 46.0	As above. As above	16	32	2.0		0.0	
	450.0 48.0	As above, trace fine gravel	17	58	1.7		0.0	
	449.0 49.0	***Silty Sand*** Reddish brown, wet, mostly fine sand, little non-plastic fines, few fine gravel, hard, auger refusal (51.2 fbgs), suspected top of bedrock.	18	NA	0.7		0.0	
50.0	446.8 51.2	End of Borehole						
55.0								
60.0								
65.0								
70.0								



Drilled By: Earth Dimensions, Inc.
Drill Rig Type: Diedrich D120
Drill Method: 4.2-inch HSA, 2" ss
Comments:
Drill Date(s): 5/30/12

Hole Size: 8 inch
Stick-up: Flush Mount
Datum: Site Datum of 500 fmsl.

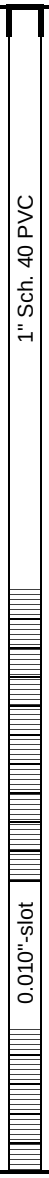
Sheet: 2 of 2

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-1**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/14/06 / 08:00 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/14/06 / 08:30 AM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, blocky, lensed, massive) Consistency/Density (Standard Penetration Test, SPT), Weathering/Fracturing, Odor, Fill Materials (if present), Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-1' Fine Brown Sand/gravel -FILL, dry, loose					
-2	2	S1	2.0	1'-2' Crushed Red Brick/Sand FILL, dry, loose	**FILL**	0.0	N/A	Y	
-4	4								
-6	6	S2	2.5	0-0.5' Red Brick, FILL, dry, loose 0.5'-2.5' light brown, Fine SAND, uniformly- poorly graded, dry, loose	**SP**	0.0	N/A	N	
-8	8								
-10	10	S3	4.0	0.0-4.0' light brown, Fine SAND, uniformly- poorly graded, dry to slightly moist, loose	**SP**	0.0	N/A	N	
-12	12								
-14	14	S4	4.0	0.0-4.0' light brown, Fine SAND As Above, uniformly- poorly graded, wet at bottom of core, loose	**SP**	0.0	N/A	N	
-16	16								
-18	18	S5	4.0	0.0-4.0' light brown, Fine SAND As Above, uniformly- poorly graded, wet, soft	**SP**	0.0	N/A	N	
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

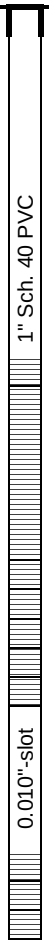
COMMENTS: Collected soil samples for TCL VOCs from 1-4' (fbgs) interval

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-2**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/14/06 / 09:00 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/14/06 / 10:00 AM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.9' Asphalt, crushed stone, FILL, dry 0.9'-1.8' Olive brown sandy silt with trace clay, soft, moist					
-2	2	S1	3.0	1.8'-3' Light brown Fine SAND, uniformly-poorly graded, dry, loose	**FILL/ SP**	1.1	N/A	N	
-4	4								
-6	6	S2	3.0	0-3' Light brown Fine SAND as above, uniformly-poorly graded, dry, loose	**SP**	4.2 ppm at 6-8'	N/A	Y	
-8	8								
-10	10	S3	4.0	0-3.8' Light brown Fine SAND as above, uniformly-poorly graded, moist at 10.5' (fbgs), loose 3.8-4.0' red sandy clay lense, soft, wet	**SP**	0.3	N/A	N	
-12	12								
-14	14	S4	4.0	0.0-4.0' light brown, Fine SAND As Above, uniformly- poorly graded, wet, loose	**SP**	0.0	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

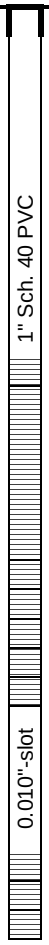
COMMENTS: Collected soil samples for TCL VOCs from 6-8' (fbgs) interval

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-3**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/14/06 / 03:00 PM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/14/06 / 04:00 PM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION USCS Classification: Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-1.5' Black dry silt, some clay/gravel Fill					
-2	2	S1	2.5	1.5'-2.5' Light brownish tan Dry Fine SAND, mostly fine size, loose	**FILL/ SP**	5-47	N/A	Y	
-4	4								
-6	6	S2	3.0	3' Light brown to gray dry SAND, fine to medium size with little coarse sand, loose	**SP**	5-18.5 ppm at 6-8'	N/A	N	
-8	8								
-10	10	S3	4.0	4.0' Light brownish tan moist grading to wet Fine SAND, poorly graded, with one 2"-reddish clay seam at 11 fbg	**SP**	13 ppm 8-10', <5ppm 10-12'	N/A	N	
-12	12								
-14	14	S4	4.0	4.0' Light brown Wet Fine SAND, poorly graded, loose	**SP**	0.7-1.9 ppm	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

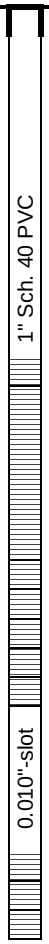
COMMENTS: Collected soil samples for TCL VOCs, Metals, SVOCs, PCBs, and Pesticides from 2-4' (fbgs) interval

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-4**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/14/06 / 10:30 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/14/06 / 11:00 AM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-2.0' Black SAND, well graded, soft, moist					
-2	2	S1	2.5	2.0'-2.5' Light brown Fine SAND, uniformly-poorly graded, dry, loose	**FILL/ SP**	2.1-4.3 ppm	N/A	N	
-4	4								
-6	6	S2	3.0	0-3' Light brown Fine SAND as above, uniformly-poorly graded, dry, loose	**SP**	15 ppm at 6-8'	N/A	Y	
-8	8								
-10	10	S3	4.0	0-3.8' Light brown Fine SAND as above, uniformly-poorly graded, moist/wet at 10.0-11.0' (fbgs), loose	**SP**	4ppm at 9'	N/A	N	
-12	12								
-14	14	S4	4.0	0.0-4.0' Light brown, Fine SAND as above, uniformly- poorly graded, wet, loose	**SP**	0.0	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

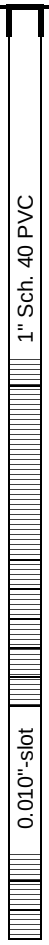
COMMENTS: Collected soil samples for TCL VOCs from 6-8' (fbgs) interval

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-5**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/14/06 / 11:30 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/14/06 / 12:00 PM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-1.5' Dark brown/olive grey sandy silt, soft moist					
-2	2	S1	3.0	1.5'-3.0' Light brown Fine SAND, uniformly-poorly graded, dry, loose	**FILL/ SP**	5-20 ppm	N/A	N	
-4	4								
-6	6	S2	3.0	0-3' Light brown/tan Fine SAND as above, uniformly-poorly graded, dry, loose Slight solvent odor detected	**SP**	35 ppm at 6-8'	N/A	N	
-8	8								
-10	10	S3	4.0	0-3.8' Light brown/tan Fine SAND as above, uniformly-poorly graded, moist/wet at 10.0-11.0' (fbgs), loose Strong solvent odor detected	**SP**	3200 ppm at 8-9'	N/A	Y	
-12	12								
-14	14	S4	4.0	0-1' Light brown/tan Fine SAND as above, uniformly-poorly graded, wet, loose 1-4' Grey/brown medium grain size SAND, wet	**SP**	>250 ppm at 12-13'. <10 ppm at 13-16'	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

COMMENTS: Collected soil samples for TCL VOCs from 8-9' (fbgs) interval

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-6**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/14/06 / 13:00:00 PM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/14/06 / 14:00:00 PM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-2.0' White Fine sand with red brick pieces- FILL, dry					1" Sch. 40 PVC
-2	2	S1	2.0		**FILL/ SP**	18 ppm	N/A	N	
-4	4								
		S2	2.5	0-1' FILL material as above 1-2.5' Light brown Fine SAND, uniformly-poorly graded, dry loose	**FILL/SP**	53 ppm at 6-8'	N/A	Y	
-6	6								
-8	8								
		S3	4.0	0-1' Light brown/tan Fine SAND as above, uniformly-poorly graded, wet at 9.0' (fbgs), loose 1' -1.2' Red Clay lense, soft, high plasticity 1.2-4.0' Grey/Brown medium grain size sand, wet, loose	**SP**	53 ppm at 8'	N/A	N	
-10	10								
-12	12								
		S4	4.0	0-4' Grey/brown medium SAND, with trace of coarse sand, wet, loose	**SP**	1.5 ppm at 12-13'	N/A	N	0.010"-slot
-14	14								
-16	16								
-18	18								
-20	20								

PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

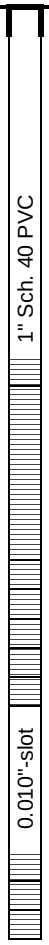
COMMENTS: Collected soil samples for TCL VOCs from 6-8' (fbgs) interval

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-7**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/15/06 / 12:30 PM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/15/06 / 13:00 PM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-1.8' Black fine sand and gravel, moist, loose					
-2	2	S1	2.5	1.8-2.0' Crushed red brick, FILL, dry, loose 2.0-2.5' White fine sand, fine subangular gravel, loose, dry	**FILL/ SP**	0	N/A	Y	
-4	4								
-6	6	S2	2.5	0-1.5' FILL, brick, dark grey fine sand, some fine white sand, dry, loose 1.5-2.5' Light brown/tan Fine SAND, uniformly-poorly graded, dry loose	**SP**	0	N/A	N	
-8	8								
-10	10	S3	2.5	0-2.5' Light brown/tan Fine SAND as above, uniformly-poorly graded, moist at 11.0' (fbgs), loose	**SP**	0	N/A	N	
-12	12								
-14	14	S4	4.0	0-3' Light brown/tan Fine SAND as above, wet 3-4' Light brown sand with increasing fine grain clay. Red clay lense < 2-inches thick at bottom of core (approx 16' fbgs)	**SP**	0	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

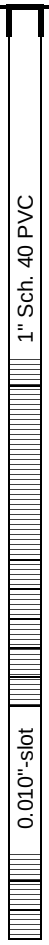
COMMENTS: Collected soil samples for TCL VOCs from 2-4' (fbgs) interval

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-8**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/15/06 / 10:00 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/15/06 / 10:40 AM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-2.6' Black sandy silt, trace clay, brick fragments, FILL, moist, loose					
-2	2	S1	3.0	2.6-3.0' Fine light brown/tan SAND, uniformly-poorly graded, moist, loose	**FILL/ SP**	0	N/A	Y	
-4	4								
-6	6	S2	3.5	0-3.5' Light brown/tan Fine SAND, uniformly-poorly graded, dry loose	**SP**	0	N/A	N	
-8	8								
-10	10	S3	4.0	0-4.0' Light brown/tan Fine SAND as above, uniformly-poorly graded, moist/wet at 11.0' (fbgs), loose	**SP**	0	N/A	N	
-12	12								
-14	14	S4	4.0	0-4.0' Light brown/tan Fine SAND as above, uniformly-poorly graded, wet, loose	**SP**	0	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

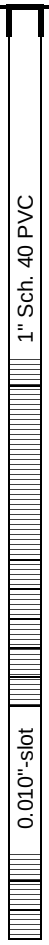
COMMENTS: Collected soil samples for TCL VOCs, SVOCs, PCBs, Pesticides/Herbicides and TAL Metals from 1-4' (fbgs) interval.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-9**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/15/06 / 07:30 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/15/06 / 08:00 AM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0			0-0.5' Asphalt, crushed stone, FILL, dry 0.5'-2.0' Black sandy SILT, non-cohesive, soft, dry					
-2	2	S1	3.0	2.0-3.0' Fine light brown/tan SAND, uniformly-poorly graded, dry, loose	**FILL/ SP**	0	N/A	Y	
-4	4								
-6	6	S2	3.5	0-3.5' Light brown/grey Fine SAND, uniformly-poorly graded, dry loose	**SP**	0	N/A	Y	
-8	8								
-10	10	S3	4.0	0-4.0' Light brown/grey Fine SAND as above, uniformly-poorly graded, moist/wet at 10.0' (fbgs), loose	**SP**	0	N/A	N	
-12	12								
-14	14	S4	4.0	0-4.0' Light brown/grey Fine SAND as above, uniformly-poorly graded, wet, loose	**SP**	0	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

COMMENTS: Collected soil samples for TCL VOCs plus MS/MSD from 2-4' (fbgs) interval.

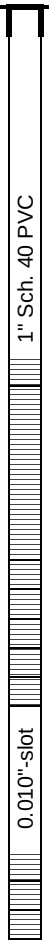
Collected soil samples for TCL SVOCs, PCBs, Pesticides/Herbicides,TAL Metals plus MS/MSD from 4-8' (fbgs) interval.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**PZ-10**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/15/06 / 09:00 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/15/06 / 09:40 AM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0								
-2	2	S1	2.0	0-2.0' Asphalt, crushed stone, brick, fine sand FILL, dry	**FILL/SP**	0	N/A	N	
-4	4								
-6	6	S2	4.0	0-4.0' Light brown/tan Fine SAND, uniformly-poorly graded, dry loose	**SP**	0	N/A	Y	
-8	8								
-10	10	S3	4.0	0-4.0' Light brown/tan Fine SAND as above, uniformly-poorly graded, moist/wet at 10.0' (fbgs), loose	**SP**	0	N/A	N	
-12	12								
-14	14	S4	4.0	0-4.0' Light brown/tan Fine SAND as above, uniformly-poorly graded, wet, loose	**SP**	0	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

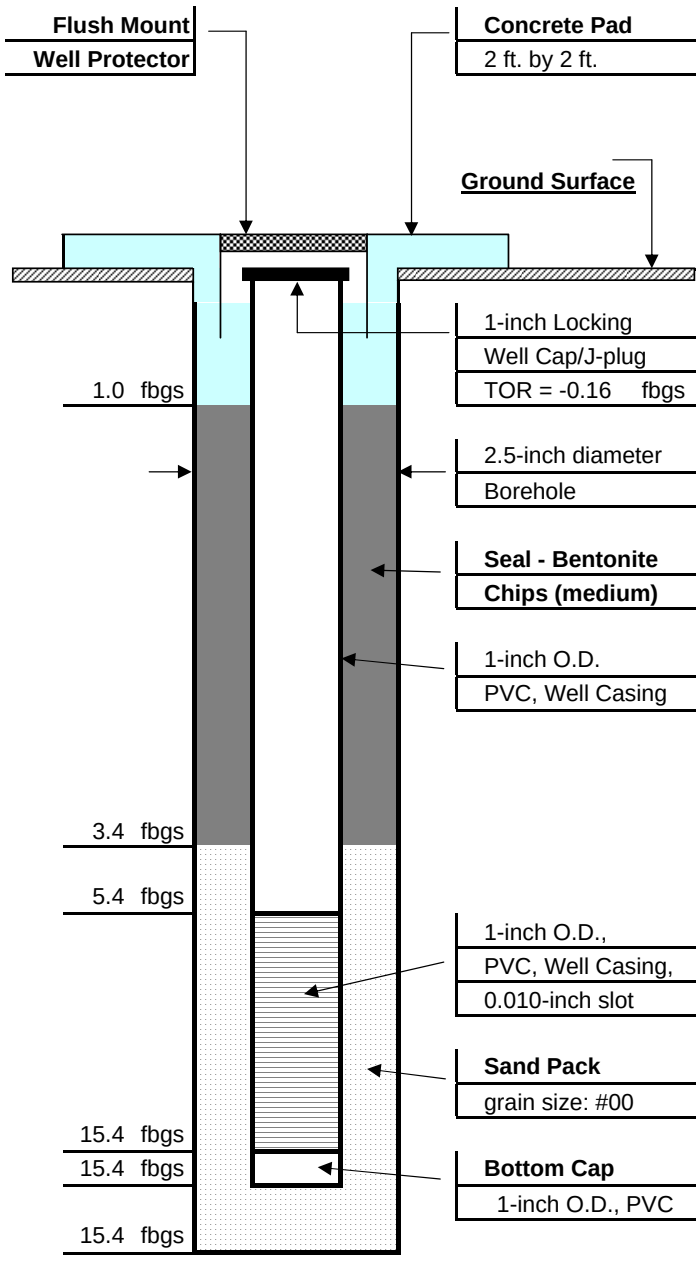
Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

COMMENTS: Collected soil samples for TCL VOCs from 4-8' (fbgs) interval.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT PIEZOMETER COMPLETION DETAIL

Project Name:	BDC - 267 Franklin Investigation	WELL NUMBER:	**PZ-11**
Client:	Buffalo Development Corporation	Date Installed:	12/27/06
Boring Location:	267 Franklin Street	Project Number:	0156-001-400



Driller Information

Company:	Trec Environmental, Inc.
Driller:	Jim
Helper:	NA
Permit Numbe	NA
Drill Rig Type:	Geoprobe 6620DT

Well Information

Land Surface Elevation:	498.18	fmsl (approximate)
Drilling Method:	direct-push technology	
Soil Sample Collection Method:	none	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	Schedule 40 PVC, 1-inch
Screen:	Schedule 40 PVC, 1-inch
Sump:	None
Sand Pack:	#00
Annular Seal:	Bentonit Chips (medium)

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	0.75" poly. Disp. Bailer via purge and surge	
Date Completed:	1/5/2007	
BM/TK Personnel:	TAB, PWW	
Total Volume Purge	20.0	gallons
Static Water Level:	10.55	fbTOR
Pump Depth:	NA	
Purge Duration:	25	minutes
Yeild:	0.8	gpm
Specific Capacity:	0.17	gpm/ft

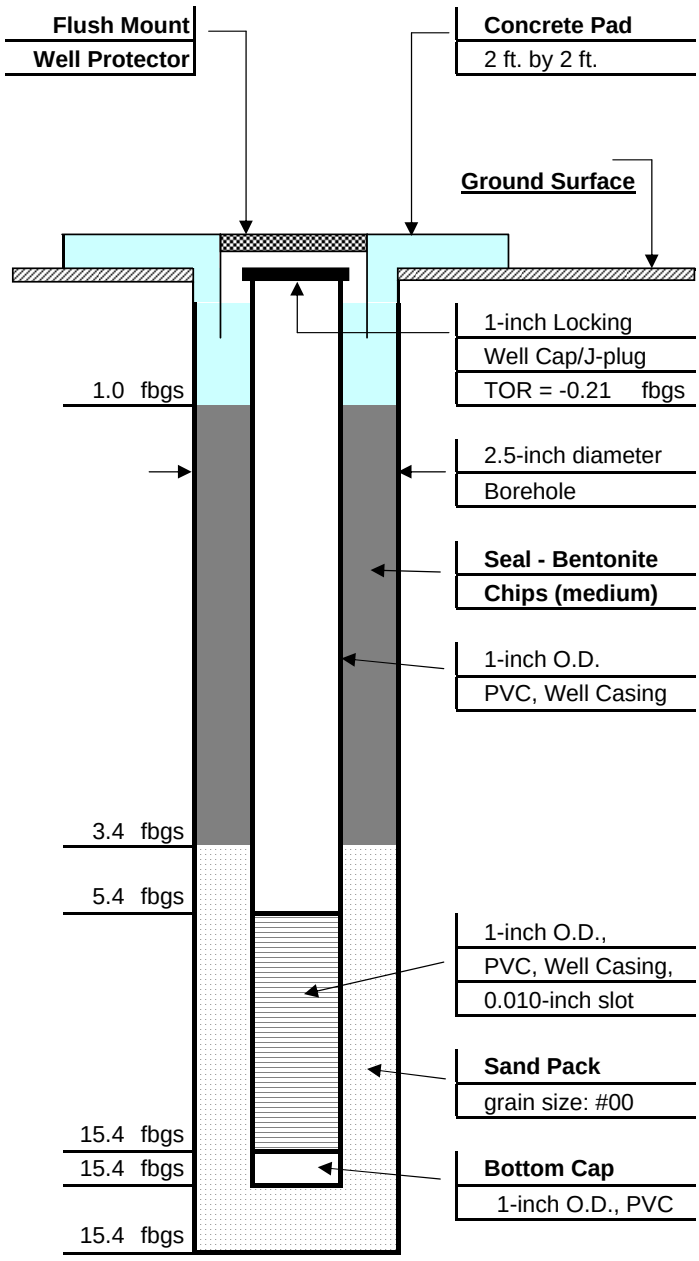
Comments:

PREAPRED BY: TAB DATE: 01/02/07

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT PIEZOMETER COMPLETION DETAIL

Project Name:	BDC - 267 Franklin Investigation	WELL NUMBER:	**PZ-12**
Client:	Buffalo Development Corporation	Date Installed:	12/27/06
Boring Location:	267 Franklin Street	Project Number:	0156-001-400



Driller Information

Company:	Trec Environmental, Inc.
Driller:	Jim
Helper:	NA
Permit Numbe	NA
Drill Rig Type:	Geoprobe 6620DT

Well Information

Land Surface Elevation:	498.14	fmsl (approximate)
Drilling Method:	direct-push technology	
Soil Sample Collection Method:	none	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	Schedule 40 PVC, 1-inch
Screen:	Schedule 40 PVC, 1-inch
Sump:	None
Sand Pack:	#00
Annular Seal:	Bentonit Chips (medium)

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	0.75" poly. Disp. Bailer via purge and surge	
Date Completed:	1/5/2007	
BM/TK Personnel:	TAB, PWW	
Total Volume Purge	20.0	gallons
Static Water Level:	10.57	fbTOR
Pump Depth:	NA	
Purge Duration:	22	minutes
Yeild:	0.9	gpm
Specific Capacity:	0.19	gpm/ft

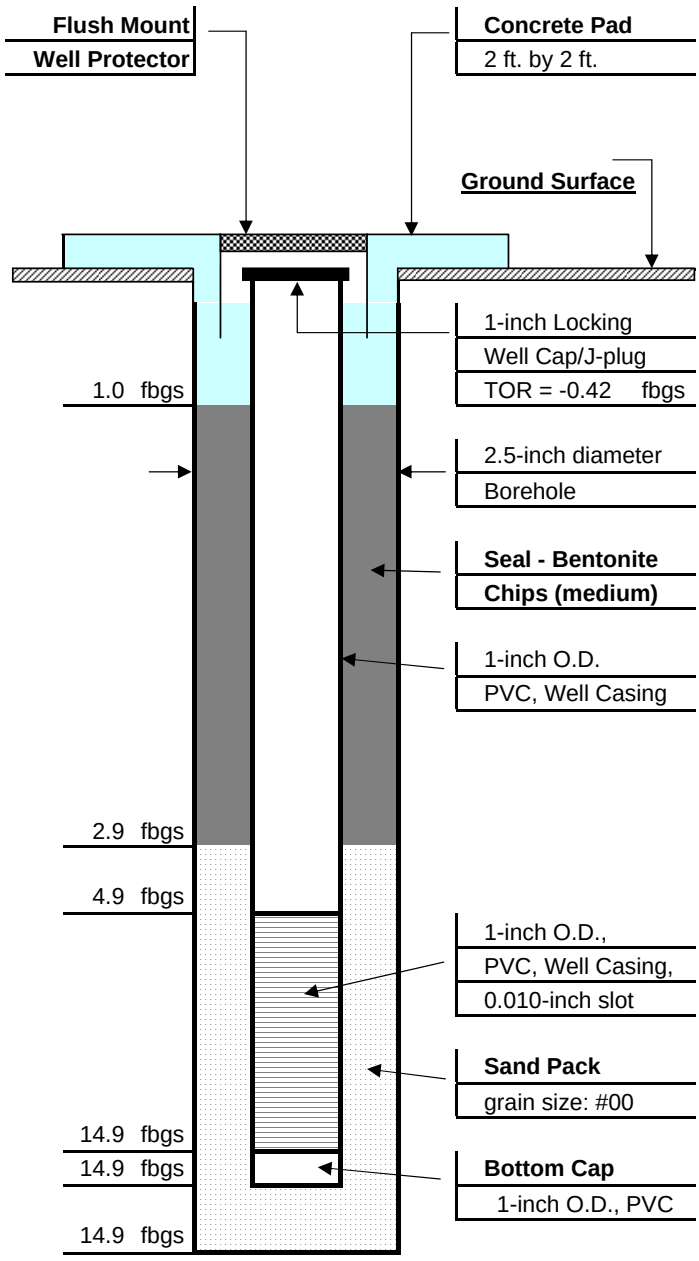
Comments:

PREAPRED BY: TAB DATE: 01/02/07

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT PIEZOMETER COMPLETION DETAIL

Project Name:	BDC - 267 Franklin Investigation	WELL NUMBER:	**PZ-13**
Client:	Buffalo Development Corporation	Date Installed:	12/27/06
Boring Location:	267 Franklin Street	Project Number:	0156-001-400



Driller Information

Company:	Trec Environmental, Inc.
Driller:	Jim
Helper:	NA
Permit Numbe	NA
Drill Rig Type:	Geoprobe 6620DT

Well Information

Land Surface Elevation:	498.47	fmsl (approximate)
Drilling Method:	direct-push technology	
Soil Sample Collection Method:	none	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	Schedule 40 PVC, 1-inch
Screen:	Schedule 40 PVC, 1-inch
Sump:	None
Sand Pack:	#00
Annular Seal:	Bentonit Chips (medium)

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	0.75" poly. Disp. Bailer via purge and surge	
Date Completed:	1/5/2007	
BM/TK Personnel:	TAB, PWW	
Total Volume Purge	18.0	gallons
Static Water Level:	10.53	fbTOR
Pump Depth:	NA	
Purge Duration:	28	minutes
Yeild:	0.6	gpm
Specific Capacity:	0.15	gpm/ft

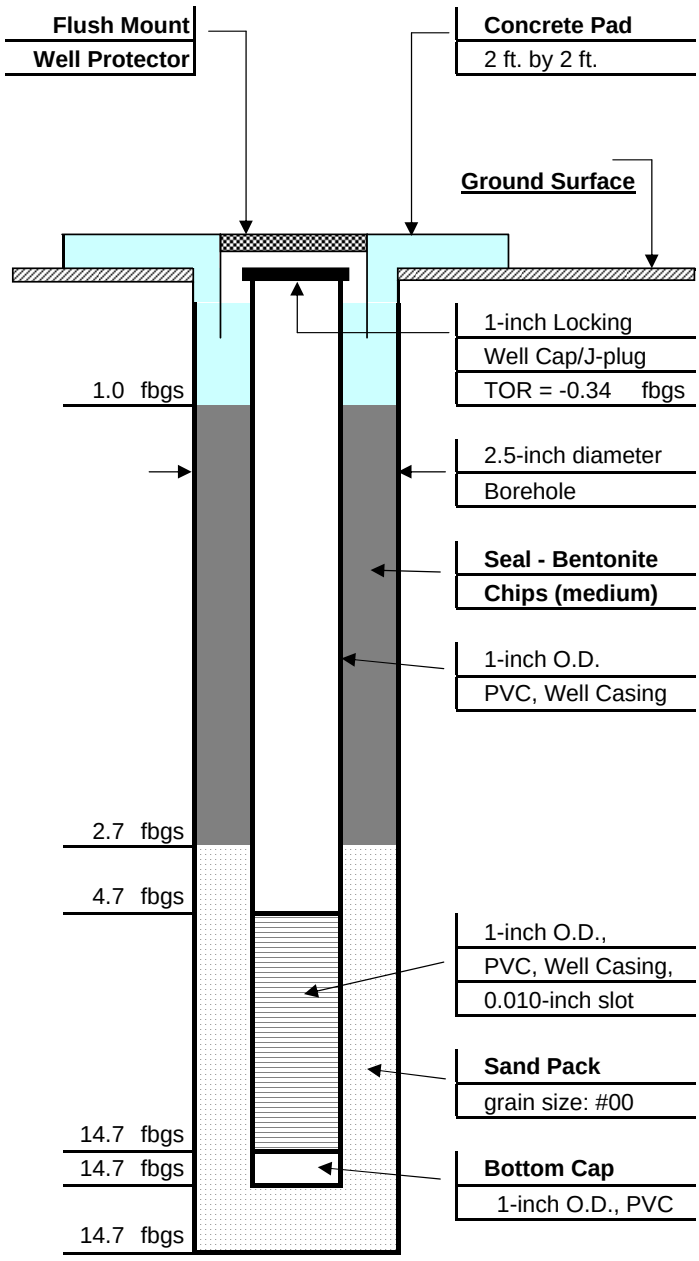
Comments:

PREAPRED BY: TAB DATE: 01/02/07

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT PIEZOMETER COMPLETION DETAIL

Project Name:	BDC - 267 Franklin Investigation	WELL NUMBER:	**PZ-14**
Client:	Buffalo Development Corporation	Date Installed:	12/27/06
Boring Location:	267 Franklin Street	Project Number:	0156-001-400



Driller Information

Company:	Trec Environmental, Inc.
Driller:	Jim
Helper:	NA
Permit Numbe	NA
Drill Rig Type:	Geoprobe 6620DT

Well Information

Land Surface Elevation:	498.26	fmsl (approximate)
Drilling Method:	direct-push technology	
Soil Sample Collection Method:	none	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	Schedule 40 PVC, 1-inch
Screen:	Schedule 40 PVC, 1-inch
Sump:	None
Sand Pack:	#00
Annular Seal:	Bentonit Chips (medium)

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	0.75" poly. Disp. Bailer via purge and surge	
Date Completed:	1/5/2007	
BM/TK Personnel:	TAB, PWW	
Total Volume Purge	17.0	gallons
Static Water Level:	10.75	fbTOR
Pump Depth:	NA	
Purge Duration:	20	minutes
Yeild:	0.9	gpm
Specific Capacity:	0.21	gpm/ft

Comments:

PREAPRED BY: TAB DATE: 01/02/07

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: 470 Pearl Street, LLC		**Log of Boring No.: SB-1**	
BORING LOCATION: 279 Franklin St., Buffalo, NY		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: BMS Drilling		DATE STARTED: 01/18/06	DATE FINISHED: 01/18/06
DRILLING METHOD: Direct Push		TOTAL DEPTH:	SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe		DEPTH TO WATER: FIRST: / COMPL.:	CASING:
SAMPLING METHOD: 4' Macro Cores		LOGGED BY: JMA	
HAMMER WEIGHT: --	DROP: --	RESPONSIBLE PROFESSIONAL: PTM	REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION USCS Classification: Color, Moisture Condition, % of Soil Type, Texture, Plasticity, Fabric, Bedding, Weathering/Fracturing, Odor, Other SURFACE ELEVATION (FMSL):	REMARKS
0					2.8'		0.2' Gray run-of-crusher, moist	
		X				1	0.7' Brown gravel and sand, loose, fill, moist	
1		X					1.1' As above, with brick	
2							1.0' Brown fine sand, little very fine sand, loose when disturbed, moist	
3								
4							Boring complete at 4'.	

ABANDONMENT: Hole filled with original cuttings, sand and topped with cold patch.

Volume of cement/bentonite grout required:	$V = \pi r^2 \times 7.48 =$ gallons	borehole depth =	ft.
Volume of cement/bentonite grout installed:	gallons	borehole diameter =	ft.
Has bridging of grout occurred? ☐ yes ☐ no		borehole radius =	ft.
If yes, explain resolution:			
Method of installation:			

Project No: 0099-002-100	**Benchmark Environmental Engineering & Science, PLLC**	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: 470 Pearl Street, LLC		**Log of Boring No.: SB-2**	
BORING LOCATION: 279 Franklin St., Buffalo, NY		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: BMS Drilling		DATE STARTED: 01/18/06	DATE FINISHED: 01/18/06
DRILLING METHOD: Direct Push		TOTAL DEPTH:	SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe		DEPTH TO WATER: FIRST: / COMPL.:	CASING:
SAMPLING METHOD: 4' Macro Cores		LOGGED BY: JMA	
HAMMER WEIGHT: --	DROP: --	RESPONSIBLE PROFESSIONAL: PTM	REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (USCS Classification: Color, Moisture Condition, % of Soil Type, Texture, Plasticity, Fabric, Bedding, Weathering/Fracturing, Odor, Other)	REMARKS
							SURFACE ELEVATION (FMSL):	
0					2.8'		0.2' Gray run-of-crusher, moist	
		X				1.7	0.6' Grayish brown sand and gravel fill, slightly moist, loose	
1		X					0.6' Dark brown sand with silt, glass, brick, fill, moist	
							1.4' Brown fine sand, little very fine sand, loose when disturbed, moist	
2								
3								
4							Boring complete at 4'.	

ABANDONMENT: Hole filled with original cuttings, sand and topped with cold patch.

Volume of cement/bentonite grout required:	$V = \pi r^2 \times 7.48 =$ gallons	borehole depth =	ft.
Volume of cement/bentonite grout installed:	gallons	borehole diameter =	ft.
Has bridging of grout occurred? ☐ yes ☐ no		borehole radius =	ft.
If yes, explain resolution:			
Method of installation:			

Project No: 0099-002-100	**Benchmark Environmental Engineering & Science, PLLC**	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: 470 Pearl Street, LLC		**Log of Boring No.: SB-1**	
BORING LOCATION: 432 Pearl St., Buffalo, NY		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: BMS Drilling		DATE STARTED: 01/18/06	DATE FINISHED: 01/18/06
DRILLING METHOD: Direct Push		TOTAL DEPTH:	SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe		DEPTH TO WATER: FIRST: / COMPL.:	CASING:
SAMPLING METHOD: 4' Macro Cores		LOGGED BY: JMA	
HAMMER WEIGHT: --	DROP: --	RESPONSIBLE PROFESSIONAL: PTM	REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION USCS Classification: Color, Moisture Condition, % of Soil Type, Texture, Plasticity, Fabric, Bedding, Weathering/Fracturing, Odor, Other SURFACE ELEVATION (FMSL):	REMARKS
0					1.9'		0.2' Gray run-of-crusher ??-slag, moist	
		X				1.8	0.7' Brown sand with brick fill, loose when disturbed, moist	
1		X					0.7' Slag, concrete, brick, sand fill, loose	
							0.3' Brown sand with trace to little very fine sand, loose when disturbed,	
2							moist	
3								
4							Boring complete at 4'.	

ABANDONMENT: Hole filled with original cuttings, sand and topped with cold patch.

Volume of cement/bentonite grout required:	$V = \pi r^2 \times 7.48 =$ gallons	borehole depth =	ft.
Volume of cement/bentonite grout installed:	gallons	borehole diameter =	ft.
Has bridging of grout occurred? ☐ yes ☐ no		borehole radius =	ft.
If yes, explain resolution:			
Method of installation:			

Project No: 0099-002-100	**Benchmark Environmental Engineering & Science, PLLC**	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: 470 Pearl Street, LLC		**Log of Boring No.: SB-2**	
BORING LOCATION: 432 Pearl St., Buffalo, NY		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: BMS Drilling		DATE STARTED: 01/18/06	DATE FINISHED: 01/18/06
DRILLING METHOD: Direct Push		TOTAL DEPTH:	SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe		DEPTH TO WATER: FIRST: / COMPL.:	CASING:
SAMPLING METHOD: 4' Macro Cores		LOGGED BY: JMA	
HAMMER WEIGHT: --	DROP: --	RESPONSIBLE PROFESSIONAL: PTM	REG. NO.

Depth (fbgs)	SAMPLES: Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION (USCS Classification: Color, Moisture Condition, % of Soil Type, Texture, Plasticity, Fabric, Bedding, Weathering/Fracturing, Odor, Other)	REMARKS
							SURFACE ELEVATION (FMSL):	
0		X			3.1'	2.2	1.2' Dark gray crushed slag, and sand with cinders, fill, loose, moist	
1		X					0.7' Dark brown silt loam with brick, trace cinders, fill, compact, moist	
2							1.2' Brown fine sand, with trace to little very fine sand, loose when disturbed, moist	
3								
4							Boring complete at 4'.	

ABANDONMENT: Hole filled with original cuttings, sand and topped with cold patch.			
Volume of cement/bentonite grout required:	$V = \pi r^2 \times 7.48 =$ gallons	borehole depth =	ft.
Volume of cement/bentonite grout installed:	gallons	borehole diameter =	ft.
Has bridging of grout occurred? ☐ yes ☐ no		borehole radius =	ft.
If yes, explain resolution:			
Method of installation:			

Project No: 0099-002-100	**Benchmark Environmental Engineering & Science, PLLC**	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

PROJECT: 470 Pearl Street, LLC		**Log of Boring No.: SB-3**	
BORING LOCATION: 432 Pearl St., Buffalo, NY		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: BMS Drilling		DATE STARTED: 01/18/06	DATE FINISHED: 01/18/06
DRILLING METHOD: Direct Push		TOTAL DEPTH:	SCREEN INTERVAL:
DRILLING EQUIPMENT: Geoprobe		DEPTH TO WATER: FIRST: / COMPL.:	CASING:
SAMPLING METHOD: 4' Macro Cores		LOGGED BY: JMA	
HAMMER WEIGHT: --	DROP: --	RESPONSIBLE PROFESSIONAL: PTM	REG. NO.

Depth (fbgs)	Sample No.	Sample	Blows (per 6")	SPT N-Value	Recovery	PID Scan (ppm)	SAMPLE DESCRIPTION USCS Classification: Color, Moisture Condition, % of Soil Type, Texture, Plasticity, Fabric, Bedding, Weathering/Fracturing, Odor, Other SURFACE ELEVATION (FMSL):	REMARKS
0		X			2.8'	2.1	0.7' Dark gray crushed slag, sand, trace brick, cinders, fill, loose, moist	
		X					0.9' Brown sand with cinders, brick fill, loose, moist	
1								
							1.2' Brown fine sand with trace to little very fine sand, loose when	
2							disturbed, moist	
3								
4							Boring complete at 4'.	

ABANDONMENT: Hole filled with original cuttings, sand and topped with cold patch.

Volume of cement/bentonite grout required:	$V = \pi r^2 \times 7.48 =$ gallons	borehole depth =	ft.
Volume of cement/bentonite grout installed:	gallons	borehole diameter =	ft.
Has bridging of grout occurred? ☐ yes ☐ no		borehole radius =	ft.
If yes, explain resolution:			
Method of installation:			

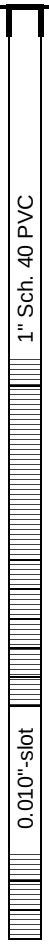
Project No: 0099-002-100	**Benchmark Environmental Engineering & Science, PLLC**	Figure

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD GEOPROBE BOREHOLE \ WELL INSTALLATION LOG

Project Name:	Buffalo Development Corp	**BORING NUMBER:**	**SB-4 432 Pearl Street**
Project Number:	0099-003-100	**Location:**	275-279 Franklin St, 432 Pearl St
Client:	Knoer Crawford & Bender, LLP	**Start Date/Time:**	11/15/06 / 08:30 AM
Drilling Company:	BMS Drilling	**End Date/Time:**	11/15/06 / 09:00 AM
Driller:	Jeff Rowley	**Logged By:**	RLD
Helper:		**Drilling Method:**	direct push
Rig Type:	Truck mount geoprobe	**Weather:**	Cloudy 45*F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Recovery (feet)	SAMPLE DESCRIPTION **USCS Classification:** Color, Moisture Condition, Primary Soil Type, Secondary Soil Type(<5% Trace, 10-15% Little, 15-30% Few, 35-45% Some), Structure (varved, stratified, thinly bedded, bedded, thickly bedded, laminated, fissured, bloc	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Piezometer Detail
0	0								
-2	2	S1	1.5	0-1.5' Asphalt, crushed stone, FILL, dry	**FILL/SP**	0	N/A	N	
-4	4								
-6	6	S2	2.5	0-2.5' Light brown/grey Fine SAND, uniformly-poorly graded, dry loose	**SP**	0.3	N/A	Y	
-8	8								
-10	10	S3	4.0	0-4.0' Light brown/grey Fine SAND as above, uniformly-poorly graded, moist/wet at 10.0' (fbgs), loose	**SP**	0	N/A	N	
-12	12								
-14	14	S4	4.0	0-4.0' Light brown/tan Fine SAND as above, uniformly-poorly graded, wet, loose	**SP**	0	N/A	N	
-16	16								
-18	18								
-20	20								



PIEZOMETER DETAILS (approximate):

Screened Interval:	10 FT	Diameter:	1-INCH
Well Material	PVC	Other:	Installed flush mount curb box

COMMENTS:

Collected soil samples for TCL VOCs, SVOCs, PCBs, Pesticides/Herbicides,TAL Metals from 4-8' (fbgs) interval.

Project No: 0156-001-102

Borehole Number: SB - 7

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 12.5 – 25)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							*Blow Counts*
	0.0	***Asphalt***							
		Fill Black dark brown, moist, fill, silt with some fine and coarse sand with some fine gravel, medium dense loose when disturbed, with orange brick.	1	11	0.8		0.0		*_,6,5,4*
	-2.0 2.0	As above, with weathered concrete.	2	13	0.6		0.0		*7,9,4,3*
	-4.0 4.0	***Fine Sand*** Medium brown, moist, fine sand with few silt, trace fine gravel, medium dense, loose when distrubed.	3	14	0.8		0.0		*1,1,13,8*
5.0	-6.0 6.0	As above, coarse gravel in shoe, no fine gravel.	4	24	0.5		0.0		*15,12,12,11*
	-8.0 8.0	As above, little medium sand, trace silt, no coarse gravel, faint laminations.	5	12	1.7		0.0		*7,4,8,12*
10.0	-10.0 10.0	As above, wet at 11.0 fbgs, slow dilatancy.	6	18	1.3		0.0		*7,8,10,13*
	-14.0 14.0	As above with trace fine gravel, rapid dilatancy.	7	17	0.6		0.0		*5,9,8,15*
15.0	-19.0 19.0	As above but grey color, no fine gravel, red orange iron band at 19.0 fbgs.	8	15	0.7		0.0		*1,5,10,17*
20.0									

DTW = 11.0 fbgs

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch SS and HQ core barrel

Drill Date(s): 4/23/08 - 4/24/08

Hole Size: 6 5/8"
Stick-up: NA
Datum: Site Datum

Sheet: 1 of 3

Project No: 0156-001-102

Borehole Number: SB - 7

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

Benchmark Environmental Engineering & Science, PLLC
726 Exchange Street, Suite 624
Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 12.5 / 25)	Lab Sample	Well Completion Details or Remarks
			8	13			0.0		
	-24.0 / 24.0	As above but brown grey color, with some medium sand with little coarse sand, and few fine gravel, with trace silt, no Iron band.							
25.0			9	31	1.3		0.0		*5,8,23,24*
	-29.0 / 29.0	As above, dense.							
30.0			10	33	0.8		0.0		*5,11,22 over packed spoon*
	-34.0 / 34.0	As above, but brown color, with no medium sand, no coarse sand, and no fine gravel, very dense.							
35.0			11	45	0.5		0.0		*4,13,32 over packed spoon*
	-39.0 / 39.0	As above, dense.							
40.0			12	36	0.6		0.0		*7,11,25,36*

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch SS and HQ core barrel

Drill Date(s): 4/23/08 - 4/24/08

Hole Size: 6 5/8"
Stick-up: NA
Datum: Site Datum

Sheet: 2 of 3

Project No: 0156-001-102

Borehole Number: SB - 7

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 12.5 / 25)	Lab Sample	Well Completion Details or Remarks
			12	36			0.0		
	-44.0 / 44.0	As above, grey/brown color.							
45.0			13	40	1.3		0.0		3,15,25,38
	-46.0 / 46.0	***Sandy Silt*** Reddish brown, moist,sandy silt, with few coarse sand, massive, stiff to hard.	14	43	0.6		0.0		15,43,100/4
	-48.0 / 48.0	As above.	15	34	0.9		0.0		4,11,23,25
50.0	-50.0 / 50.0	As above.	16	59	0.3		0.0		10,23,26,27
	-52.0 / 52.0	As above.	17	100/1	0.2		0.0		100/1
		Limestone Onondaga Limestone, dark blue grey, strong, microcrystaline, thickly bedded, slightly disintigrated, blocky. Fracture denisty; 0.55', 1.6, 2.1', 3.0',3.7', 4.0', 5.0 - 5.2' Recovery (feet) 5.9/6 .0 = 98% RQD 5.2/5.9 = 94%	RUN #1						
55.0									
	-58.2 / 58.2	End of Borehole							
60.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch SS and HQ core barrel

Drill Date(s): 4/23/08 - 4/24/08

Hole Size: 6 5/8"
Stick-up: NA
Datum: Site Datum

Sheet: 3 of 3

Project No: 0156-001-102

Borehole Number: SB - 8

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
0.0	Ground Surface								*Blow Counts*
	0.0	***Asphalt***							
		Fill Black, moist, fill, silt with some fine to coarse sand and fine gravel, medium dense, loose when disturbed, with orange brick.	1	14	1.2		0.0		*9,5,5*
	2.0	***Fine Sand*** Medium brown, moist , fine sand, with few silt, medium dense, loose when disturbed, finely laminated.	2	12	1.9		0.0		*6,7,5,6*
	4.0	As above, with few medium sand, trace silt, no laminations, with iron banding.							
5.0			3	15	0.9		0.0		*5,6,9,11*
	6.0	As above.							
			4	23	1.3		0.0		*9,12,11,13*
	8.0	As above, trace medium sand.							
			5	20	1.0		0.0		*12,8,12,15*
10.0	10.0	As above, wet in shoe.							*DTW = 11 fbgs*
			6	17	1.3				*5,9,8,12*
	14.0	As above, wet, rapid dilatancy.							
15.0	15.0	***Silty Clay*** Reddish brown, wet, silty clay with trace sand, firm.	7	21	1.7				*6,10,11,8*
	19.0								
20.0			8	25	1.3		0.0		*4,11,14,19*

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/22/08 - 4/23/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 1 of 4

Project No: 0156-001-102

Borehole Number: SB - 8

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
		Fine Sand Medium brown, wet , fine sand, with few silt, trace fine gravel, medium dense, loose when disturbed.	8	23			0.0		
	24.0	As above.							
25.0			9	16	1.3		0.0		*2,5,11,13*
	29.0	As above, more grey color, with some medium sand, few coarse sand and trace fine gravel, med. dense.							
30.0			10	24	1.4		0.0		*15,21,33 over packed spoon*
	34.0	As above, with few silt and no coarse sand or fine gravel, with iron staining.							
35.0	35.0	As above but grey color, very dense.	11	120	1.1		0.0		*16,48,72 over packed spoon*
	39.0	As above, brown color.							
40.0			12	27	0.7		0.0		*3,10,17,25*

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/22/08 - 4/23/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 8

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
			12	27			0.0		
	41.0	***Sandy Silt*** Reddish brown, wet, sandy silt with trace coarse sand, firm.	13	32	0.5		0.0		*4,11,21,30*
	43.0	***Silty Clay*** Reddish brown, silty clay with trace fine sand, medium soft, slight laminations.							
	44.0	***Fine Sand*** Medium brown, wet , fine sand, with few silt, very dense, loose when disturbed.	14	69	0.6		0.0		*6,21,48,72*
45.0	45.0	As above, reddish brown, dense.	15	49	0.9		0.0		*8,21,28,32*
	47.0	As above, brown/ grey, very dense.	16	54	0.3		0.0		*6,26,28,37*
	49.0	As above, dense	17	30	0.4				*10,12,18,22*
50.0	51.0	***Silty Clay*** Reddish brown, moist, silty clay with some fine sand and few fine gravel, grey fine sand filled fractures.	18	37	0.8		0.0		*9,16,21,33*
	53.0	***Sandy Silt*** Reddish brown, moist, sandy silt, with few coarse sand and few fine gravels, hard.	19	100 / .2	0.6		0.0		*7,10,100/.2*
55.0	54.7	***Limestone*** Onondaga Limestone, Dark blue grey, very strong, microcrystaline, thickly bedded, moderatly disintigrated, blocky. Fracture Density; 0.7', 0.95', 1.7', 1.8', 1.9', 4.1 - 4.2', Recovery (fbgs) 5.9/6.0 = 98% RQD 5.2/5.9 = 88% Good.	RUN #1						*top of rock*
60.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/22/08 - 4/23/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 8

Project: 275 - 277 Franklin Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 275-277 Franklin Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm 0 50 100	Lab Sample	Well Completion Details or Remarks
	60.7	End of Borehole							
65.0									
70.0									
75.0									
80.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/22/08 - 4/23/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 4 of 4

Project No: 0156-001-102

Borehole Number: SB - 9

Project: 275 - 277 Franklin Stree Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 277 Franklin

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm, 0 – 12.5 – 25)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							Blow Counts
	0.0	***Asphalt***							
		Fill Black, moist, fill, silt with some fine and coarse sand with some fine gravel, medium dense, loose when disturbed.	1	6	1.0		2.5		_,3,3,1
	-2.0 2.0	***Fine Sand*** Medium brown, moist , fine sand, with few silt, medium dense loose when disturbed.	2	14	1.4		1.1		3,6,8,9
	-4.0 4.0	As above, with trace medium sand.	3	13	1.0		13.1		4,6,7,8
5.0	-6.0 6.0	As above, with very fine laminations.	4	10	1.9		3.6		5,5,5,5
	-8.0 8.0	As above with some medium sand, few silt, no laminations, iron staining at 9.0 fbgs.	5	12	1.7		0.9		4,6,6,10
10.0	-10.0 10.0	As above, wet, with trace silt, slow dilatancy, no iron staining.	6	20	1.7		3.1		8,9,11,12
	-14.0 14.0	As above with trace medium sand and few coarse sand, rapid dilatancy.							
	-14.5 14.5	***Silty Clay*** Reddish brown, wet, silty clay with some fine sand, firm.	7	21	1.6		1.5		10,9,12,13
15.0		***Fine Sand*** As above, with few silt and little medium sand.							
	-19.0 19.0	As above, with few silt and little medium sand.	8	16	1.1		1.5		6,7,9,10
20.0									

DTW = 11.5 fbgs.

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/18/08 - 4/21/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 1 of 4

Project No: 0156-001-102

Borehole Number: SB - 9

Project: 275 - 277 Franklin Stree Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 277 Franklin

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 12.5 / 25)	Lab Sample	Well Completion Details or Remarks
			8	16			1.5		
	-24.0 / 24.0	As above, with trace fine gravel.							
	-24.5 / 24.5	***Silty Clay*** Reddish brown, wet, silty clay with some fine sand and trace fine gravel, firm.	9	20	1.6		0.3		*3,9,11,13*
25.0		***Fine Sand*** Brown, wet, fine sand, with little medium sand and few silt, trace fine gravel and coarse sand.							
	-29.0 / 29.0	As above with some medium sand with few coarse sand and fine gravel.	10	NA	0.6		0.6		*24,65/.4 over packed spoon*
30.0									
	-34.0 / 34.0	As above.							
		Silty Clay Reddish brown, wet, silty clay with some fine sand and trace fine gravel, firm.	11	81	0.7		0.3		*11,37,44 over packed spoon*
35.0	-36.0 / 36.0								
	-39.0 / 39.0		12	21	0.8		0.3		*6,10,11,17*
40.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/18/08 - 4/21/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 9

Project: 275 - 277 Franklin Stree Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 277 Franklin

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 12.5 / 25)	Lab Sample	Well Completion Details or Remarks
	-41.0	***Fine Sand*** Reddish brown, wet, fine sand, with little medium sand, and few silt, trace fine gravel and coarse sand.	12	21			0.3		
	41.0	As above, with some silt, and trace fine gravel.	13	27	1.1		0.3		*10,12,15,16*
	-43.0								
	43.0	As above, moist to wet.	14	44	0.6				*11,15,29,31*
45.0	-45.0								
	45.0	***Sandy Silt*** Reddish Brown, wet sandy silt, massive, hard.	15	85	0.7		0.5		*8,29,56 over packed spoon*
	-47.0								
	47.0	As above.	16	41	0.6		0.6		*9,22,19,27*
	-49.0								
	49.0	As above, with few coarse sands.	17	48	0.3		0.5		*5,14,34,40*
50.0	-51.0								
	51.0	As above.		100					
	-51.5			2					
	51.5	***Medium Sand*** Brown grey, wet, medium sand with some coarse sand and little fine gravel, and trace slit, very dense.	18		0.5		0.7		*13,72,100/.2 over packed spoon*
	-53.0								
	53.0	As above.		100					
			19	.2	0.4		0.5		*39, 100/.2*
	-54.4								*top of rock*
	54.4	***Limestone*** Onondaga Limestone, Dark blue grey, microcrystaline, thickly bedded, moderatly decomposed, moderatly disentigrated, strong, blocky. Fracture density; 0.45', 0.95', 1.1', 3.1', 3.75', 4.7'. Recovery (feet) 5.8/6.0 = 96% RQD = 5.4/5.8 = 93% excellent							
55.0									
60.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/18/08 - 4/21/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 9

Project: 275 - 277 Franklin Stree Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 277 Franklin

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm 0 12.5 25	Lab Sample	Well Completion Details or Remarks
	-60.4 / 60.4	End of Borehole							
65.0									
70.0									
75.0									
80.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss and HQ core barrel

Drill Date(s): 4/18/08 - 4/21/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 4 of 4

Project No: 0156-001-102

Borehole Number: SB - 10

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 – 12.5 – 25)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							*Blow Counts*
	0.0	***Asphalt***							
		Fill Dark brown, moist, fill, silt with fine sand, with coarse sands and fine gravel,with pieces of weathered concrete.	1	18	1.0		0.0		*10,8,12*
	-2.0 2.0	As above.	2	21	1.9		0.0		*8,10,11,9*
	-4.0 4.0	***Fine Sand*** Medium brown, moist, fine sand with little silt, medium dense, loose when disturbed.	3	14	1.2		0.0		*6,6,8,7*
5.0	-6.0 6.0	As above.	4	22	1.5		0.0		*13,11,11,15*
	-8.0 8.0	As above	5	22	1.3		0.0		*13,12,10,12*
10.0	-10.0 10.0	As above, wet, slow diatancy.	6	20	1.2		0.0		*12,10,10,12*
	-14.0 14.0	Aa above, rapid dilatancy.	7	21	1.4		0.0		*9,8,13,14*
15.0	-19.0 19.0	As above reddish brown, with some silt, trace coarse sand, laminated.	8	29	0.9		0.0		*9,13,16 over packed spoon*
20.0									

DTW = 11.0 fbgs.

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 - inch HSA, 2" SS and HQ core barrel

Drill Date(s): 4/29/08 - 4/30/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 1 of 4

Project No: 0156-001-102

Borehole Number: SB - 10

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 12.5 / 25)	Lab Sample	Well Completion Details or Remarks
			8	29			0.0		
	-24.0 / 24.0	As above brown color, little silt.							
25.0			9	26	0.8		0.0		5,8,18 over packed spoon
	-29.0 / 29.0	As above.							
	-29.5 / 29.5	***Silty Clay*** Reddish brown, wet, silty clay with trace fine sand, firm.							
30.0	-30.2 / 30.2		10	38	1.3		0.0		6,15,23,25
		Fine Sand Medium brown, wet, fine sand with little silt, with trace coarse sand and fine gravel, dense, loose when disturbed, rapid dilatancy.							
		Silty Clay As above, wet.							
		Fine Sand As above, wet.							
	-34.0 / 34.0								
	-34.5 / 34.5	***Silty Clay*** As above, wet.							
35.0	-35.0 / 35.0	***Fine Sand*** As above, wet.	11	68	0.7		0.0		8,23,45 over packed spoon
		Silty Clay As above, wet.							
	-39.0 / 39.0	***Sandy Silt*** Reddish brown, moist, sandy silt, with trace coarse sand and fine gravel, hard, massive.							
40.0			12	41	0.5		0.0		7,18,23,31

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 - inch HSA, 2" SS and HQ core barrel

Drill Date(s): 4/29/08 - 4/30/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 10

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 12.5 / 25)	Lab Sample	Well Completion Details or Remarks
			12	41			0.0		
	-44.0								
	44.0	***Fine Sand*** Brown, wet, fine sand, with trace siltand trace fine gravel, very dense.							
45.0			13	53	0.5		0.0		*5,23,30,42*
	-46.0								
	46.0								
	-48.0								
	48.0	***Sandy Silt*** Reddish brown, moist, sandy silt, with trace coarse sand, massive, hard.							
			14	72	0.6		0.0		*13,30,42,100/3 over packed spoon*
	-50.0								
50.0	50.0	***Fine Sand*** Brown to grey, wet, fine sand, with little silt and coarse sand, trace coarse gravel, very dense, loose when disturbed, rapid dilatancy.							
			15	69	0.5		0.0		*9,21,48,89*
	-52.0								
	52.0	***Sandy Silt*** Reddish brown, moist, sandy silt with little fine gravel, with veiny grey fine sand filled fractures, hard.							
			16	128	0.8		0.0		*31,33,95,100/1 over packed spoon*
	-54.0								
	54.0	Augered to top of rock.							
	-54.5								
	54.5	***Limestone*** Onondaga Limestone, dark blue grey, strong microcrystaline, fossiliferous, thickly bedded, moderatly disintigrated, moderatly decomposed, blocky. Farcture denisty; 0.0 - 0.1',0.8', 1.3', 1.9', 3.1', 3.3 - 3.4', 3.6'. Recovery (feet) 4.6/6.0 = 76% RQD 4.4/5.7 =3.3/4.6 =71% Fair.							
55.0			Run #1						
60.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 - inch HSA, 2" SS and HQ core barrel

Drill Date(s): 4/29/08 - 4/30/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 3 of 4

Project No: 0156-001-102

Borehole Number: SB - 10

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm 0 12.5 25	Lab Sample	Well Completion Details or Remarks
	-60.5								
	60.5	End of Borehole							
65.0									
70.0									
75.0									
80.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25 - inch HSA, 2" SS and HQ core barrel

Drill Date(s): 4/29/08 - 4/30/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 4 of 4

Project No: 0156-001-102

Borehole Number: SB - 11

Project: 432 Pearl Street investigration

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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Buffalo, NY
(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							*Blow Counts*
	0.0	***Asphalt***							
		Fill Orangebrick.	1	45	0.8		0.0		*40,27,18*
	-2.0 2.0	Bark brown, moist, fill, silt with fine sand, with coarse sands and fine gravel,with peices ao weathered concrete.							
	-3.0 3.0	***Fine Sand*** Medium brown, moist, fine, sand with little silt, dark braown laminations medium dense, loose when disturbed.	2	25	1.7		0.0		*14,11,14,4*
	-4.0 4.0	As above, with grey color.							
5.0	-5.0 5.0	As above less grey color.	3	11	1.9		0.0		*8,5,6,8*
	-6.0 6.0	As above,	4	26	1.7		0.0		*8,12,14,15*
	-8.0 8.0	As above, with trace medium sand, no laminations.	5	30	1.5		0.0		*10,15,15,22*
10.0	-10.0 10.0	As above, but wet, slow dilatancy	6	25	1.4		0.0		*12,12,13,16* ▽ FBGS
	-14.0 14.0	As above, rapid dilatancy.	7	38	1.2		0.0		*10,15,23,40*
	-19.0 19.0	***Silty Clay*** Reddish brown, moist, silty clay, with trace fine sand, firm.	8	23	1.4		0.0		*9,8,15,17*
20.0	-19.5 19.5								

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/28/08 - 4/29/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 1 of 4

Project No: 0156-001-102

Borehole Number: SB - 11

Project: 432 Pearl Street investigration

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
		Fine Sand Medium brown, wet, fine sand, with some silt, medium dense, loose when disturbed, rapid dilatancy.	8	23			0.0		
	-24.0 / 24.0	As above but reddish brown color, with trace coarse gravel dense.							
25.0			9	31	0.7		0.0		*10,13,18,20*
	-29.0 / 29.0	***Silty Clay*** Reddish brown, moist, silty clay, with trace fine sand and trace coarse sand, firm, slighty laminated.							
30.0	-30.0 / 30.0	***Sandy Silt*** Reddish brown, wet, sandy silt, with little clay and trace fine gravel, very dense.	10	46	0.8		0.0		*11,16,35,37*
	-34.0 / 34.0	***Fine Sand*** Brown grey, wet fine sand with little coarse sand and few fine grael, very dense, loose when disturbed, rapid dilatancy.							
35.0			11	41	1.2		0.0		*7,32,100/3 over packed spoon*
	-39.0 / 39.0	As above.							
40.0			12	106	0.2		0.0		*11,26,100/3*

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/28/08 - 4/29/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 2 of 4

Project No: 0156-001-102

Borehole Number: SB - 11

Project: 432 Pearl Street investigration

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
			12	106			0.0		over packed spoon
	-44.0								
	44.0	As above but brown color, with few medium sand and trace silt with no coarse sand or fine gravel.							
45.0			13	70	1.0		0.0		8,27,43,100/3 over packed spoon
	-46.0								
	46.0	As above.							
			14	48	0.5		0.0		18,30,100/3 over packed spoon
	-48.0								
	48.0	As Above.							
	-48.5								
	48.5	***Sandy Silt*** Reddish brown, moist, sandy silt, with trace coarse sand, massive and firm	15	70	0.4		0.0		8,27,43,100/5 over packed spoon
	-50.0								
50.0	50.0	As above.							
			16	24	1.3		0.0		7,12,12,29
	-52.0								
	52.0	***Fine Sand*** Brown grey, wet fine sand with little coarse sand and few fine grael, very dense, loose when disturbed, rapid dilatancy.	17	20	1.1		0.0		4,16,100/4 over packed spoon
	-54.0								
	54.0								
	-54.5								
	54.5	***Silty Clay*** Reddish brown, moist, silty claywith little sand fine sand, trace coarse sands, very stiff, slightly laminated.	18	49	1.1				20,29,100/3
55.0	-55.2								
	55.2	***Coarse Sand*** Dark grey to black, wet, coarse sand, with little fine gravel, denses loose when disturbed.							
		Limestone Onadaga Limestone, dark blue grey, strong microcrystaline, fossiliferous, thickly bedded, moderatly disintigrated, moderatly decomposed, blocky. Farcture denisty; 1.5', 1.8', 2.6', 3.35', 4.0', 4.2', 5.6'. Recovery (feet) 5.7/6.1 = 93% RQD 4.4/5.7 =4.4/5.7 =77%							
60.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/28/08 - 4/29/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 11

Project: 432 Pearl Street investigration

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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(716) 856-0599

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm 0 50 100	Lab Sample	Well Completion Details or Remarks
	-61.2 / 61.2	End of Borehole							
65.0									
70.0									
75.0									
80.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/28/08 - 4/29/08

Hole Size: 9-inch
Stick-up: NA
Datum: Site Datum

Sheet: 4 of 4

Project No: 0156-001-102

Borehole Number: SB - 12

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corperation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							*Blow Counts*
	0.0	***Asphalt***							
		Fill Black, moist, fill, silt with some fine and coarse sand with some fine gravel, medium dense loose when disturbed, with orange brick and cinders	1	16	1.2		0.0		*8,8,12*
	-3.1 3.1	As above, with weathered concrete.	2	6	0.3		0.0		*2,5,1,5*
	-4.0 4.0	***Fine Sand*** Medium brown, moist, fine sand with few silt, trace fine gravel, medium denses, loose when distrubed.	3	24	0.9		0.0		*3,9,15,10*
5.0	-6.0 6.0	As above, coarse gravel in shoe, no fine gravel.	4	36	1.1		0.0		*11,13,23,18*
	-8.0 8.0	As above, little medium sand, trace silt, no coarse gravel, faint laminations.	5	20	1.2		0.0		*4,6,14,10*
10.0	-10.0 10.0	As above but wet at 11.0 fbgs, slow dilatancy..	6	22	1.8		0.0		*5,913,14* ▽ FBGS
	-14.0 14.0	As above with trace fine gravel, rapid dilatancy.	7	13	1.7		0.0		*5,6,7,9*
15.0	-19.0 19.0	As above but grey color, no fine grave,red orange iron band at 19.0 fbgs.	8	16	1.4		0.0		*5,7,9,7*
20.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/24/08 - 4/27/08

Hole Size: 6 5/8"
Stick-up: NA
Datum: Site Datum

Sheet: 1 of 4

Project No: 0156-001-102

Borehole Number: SB - 12

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corperation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
			8	16			0.0		
	-24.0 / 24.0	As above but brown grey color, with some medium sand with little coarse sand, and few fine gravel, with trace silt, no Iron band.							
25.0			9	49	1.2		0.0		*5,27,22,24*
	-29.0 / 29.0	As above.							
30.0			10	56	1.7		0.0		*5,21,34,40*
	-34.0 / 34.0	As above, but brown color, with no medium sand, no coarse sand, and no fine gravel, medium dense.							
35.0			11	72	1.1		0.0		*8,30,42 over packed spoon*
	-39.0 / 39.0	As above.							
40.0			12	54	0.8		0.0		*5,23,31*

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/24/08 - 4/27/08

Hole Size: 6 5/8"
Stick-up: NA
Datum: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 12

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corperation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
			12	34			0.0		over packed spoon
	-44.0								
	44.0	As above grey brown color.							
45.0			13	101	0.7		0.0		5,28,73 over packed spoon
	-46.0								
	46.0	***Sandy Silt*** Reddish brown, moist,sandy silt, with few coarse sand, massive, hard.							
			14	93	0.5		0.0		29,64 over packed spoon
	-48.0								
	48.0	As above.							
			15	30	0.9		0.0		6,12,18,34
	-50.0								
50.0	50.0	As above.							
	-50.5								
	50.5	***Coarse Sand*** Dark grey, wet, coarse sand, with some fine gravel, very dense, loose when disturbed.	16	119	0.5		0.0		25,59,63 over packed spoon
	-52.0								
	52.0	As above.							
			17	100 / 4	0.3		0.0		100/4 over packed spoon
	-54.0								
	54.0	No recovery.	18	100	0.0				14,100/2 Top of Rock
	-54.5								
	54.5	***Limestone*** Onandaga Limestone, dark blue grey, strong, microcrystaline, thickly bedded, slightly disintigrated, blocky. Fracture denisty; 0.55', 1.6, 2.1', 3.0',3.7', 4.0', 5.0 - 5.2' Recovery (feet) 5.9/6 .0 = 98% RQD 5.2/5.9 = 94%		2					
55.0									
60.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/24/08 - 4/27/08

Hole Size: 6 5/8"
Stick-up: NA
Datum: Site Datum

Sheet: 3 of 4

Project No: 0156-001-102

Borehole Number: SB - 12

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corperation

Logged By: TAB

Site Location: 432 Pearl Street.

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm 0 50 100	Lab Sample	Well Completion Details or Remarks
	-60.6 / 60.6	End of Borehole							
65.0									
70.0									
75.0									
80.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch ss

Drill Date(s): 4/24/08 - 4/27/08

Hole Size: 6 5/8"
Stick-up: NA
Datum: Site Datum

Sheet: 4 of 4

Project No: 0156-001-102

Borehole Number: SB - 13

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							*Blow Counts*
	0.0	***Asphalt***							
		Fill Black brown/black, moist, fill, silt with fine sand, with coarse sands and fine gravel,with peices of weathered concrete.	1	11	1.4		0.0		*6,5,6*
	-2.0 2.0	***Fine Sand*** Medium brown, moist, fine sand with little silt, medium dense, loose when disturbed.	2	28	1.5		0.0		*5,13,15,18*
	-3.7 3.7	***Silty Clay*** Reddish brown, moist, silty clay with trace sand, stiff.							
5.0		***Fine Sand*** Medium brown, moist, fine sand with little silt, medium dense, loose when disturbed.	3	38	1.8		0.0		*20,18,20,21*
	-6.0 6.0	As above with dark brown laminations.	4	33	1.8		0.0		*15,16,17,19*
	-8.0 8.0	As above with little medium sand, no laminations.	5	26	1.8		0.0		*14,14,12,23*
10.0	-10.0 10.0	Aa above, wet, slow dilatancy.	6	23	1.8		0.0		*13,10,13,16* ▽ *FBGS*
	-14.0 14.0	As above rapid dilatancy, dense.	7	35	1.6		0.0		*10,12,23,29*
	-19.0 19.0	As above with trace coarse sand and fine gravel.	8	37	1.5		0.0		*7,17,20,25*
20.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch SS

Drill Date(s): 5/1/08 - 5/2/08

Hole Size: 9-inch
Stick-up: NA
Datum: NA

Sheet: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 13

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
			8	37			0.0		
	-24.0 / 24.0	As above, red orange iron staining at 25.0 fbgs, no coarse sand.							
25.0			9	37	0.6		0.0		*6,14,23,26*
	-29.0 / 29.0	As above, no fine gravel.							
30.0			10	40	0.8		0.0		*3,12,28, 100/3 over packed spoon*
	-34.0 / 34.0	***Sandy Silt*** Reddish brown, wet, sandy silt, with trace coarse sand, firm.							
35.0	-35.0 / 35.0	***Sandy Silt*** Reddish brown, wet, sandy silt, with trace coarse sand, firm.	11	24	1.1		0.0		*7,12,12,16*
		Fine Sand Medium brown, wet, fine sand, with few silt, medium dense, rapid dilatancy.							
	-39.0 / 39.0	***Fine Sand*** Grey/brown, wet, fine sand, with little medium sand and little silt, orange iron staiing at 39.3 fbgs.							
40.0	-40.0 / 40.0		12	28	0.5		0.0		*3,13,15,22*

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch SS

Drill Date(s): 5/1/08 - 5/2/08

Hole Size: 9-inch
Stick-up: NA
Datum: NA

Sheet: Site Datum

Project No: 0156-001-102

Borehole Number: SB - 13

Project: 432 Pearl Street Investigation

Client: Buffalo Development Corporation

Logged By: TAB

Site Location: 432 Pearl Street

Checked By: BCH

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SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs ppm (0 / 50 / 100)	Lab Sample	Well Completion Details or Remarks
		Silty Clay Reddish brown, moist, silty clay with some sand with trace coarse sand and fine gravel, firm, massive.	12	28			0.0		
	-44.0 / 44.0	***Sandy Silt*** Reddish brown, wet, sandy silt, with little coarse sand and trace fine gravel, firm.	13	69	0.6		0.0		*25,44,100/3 over packed spoon*
45.0	-46.0 / 46.0	As above, moist to wet to moist.	14	80	0.9		0.0		*30,50,100/4 over packed spoon*
	-48.0 / 48.0	As above, but grey color,	15	114	0.9		0.0		*48,66,100/4 over packed spoon*
	-49.5 / 49.5	***Fine Sand*** Grey, wet, fine sand, with few silt, dense rapid dilatancy.							
50.0	-50.0 / 50.0	***Medium Sand*** Grey, wet, medium sand, with little fine sand, some coarse sand with trace fine gravel, dense, loose when disturbed, rapid dilatancy.	16	102	0.7		0.0		*22,42,60,100/5 over packed spoon*
	-52.0 / 52.0	As above, with few fine gravel.	17	66	0.8		0.0		*66,100/5*
	-53.8 / 53.8	***Limestone*** Onadaga Limestone, dark blue grey, microcrystaline, fossiliferous, thickly bedded, moderatly disentigrated, blocky Fracture Density; 0.3', 0.5', 0.7', 0.8', 2.6', 2.8', 3.1', 4.1', 5.0', Recovery (feet) 5.7/6.0 = 95% RQD 3.9/5.7 = 68% fair							
55.0									
	-59.8 / 59.8	End of Borehole							
60.0									

Drilled By: Earth Dimensions
Drill Rig Type: Dietrich D 120
Drill Method: 4.25-inch HSA, 2-inch SS

Drill Date(s): 5/1/08 - 5/2/08

Hole Size: 9-inch
Stick-up: NA
Datum: NA

Sheet: Site Datum

New York State Department of Environmental Conservation
Immediate Investigation Summary Report

Appendix B

Borehole and Well Construction Logs

MALCOLM PIRNIE

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-21D

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **3**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/12/09**	
DRILL RIG TYPE **D-50**	TYPE				DATE FINISHED **5/12/09**	
GROUND WATER DEPTH **12.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					cut 24" circular hole through asphalt and course gravel			
2					hand cleared - loose med brown fine sand	1.0		
						3.0		
4								
	1.0	11 12	0.9		very loose med brown fine sand (quartz)	5.0		dry
6	1.5	17 16 18 20	2.0		loose med/dark brown gray fine sand	6.0		dry
8	1.2	11 17 35 62	0.3		firm to dense med gray brown fine sand w/ trace silt	8.0		
10	1.6	14 40 50/4	0.2		dense med gray brown fine sand w/ trace silt	10.0		moist
12	1.3	10 16 25 25	0.0		loose med/dark gray med sand w/ trace sub round gravel ~0.1" diameter	12.0		▼ wet
14	1.8	10 12 17 22	0.0		very loose med gray med/coarse sand	14.0		wet
16	1.6	3 2 6 12	0.1		loose med/dark gray med/coarse sand w/ trace fine sand	16.0		saturated
18	1.8	6 12 17 20	0.4		loose med brown gray fine to med sand	18.0		saturated soil sample collected 18-20'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-21D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **2** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
					med dense med brown fine to med sand	20.0		saturated
	1.8	3 6 8 11	0.0					
22					very loose med/dark brown fine sand w/ med sand and silt	22.0		saturated
	1.8	2 5	0.0					
24					loose med/light brown fine sand w/trace silt	24.0		saturated
	1.7	2 2 8 5	0.0					
26					loose/stiff med brown fine sand	26.0		moist
	1.9	5 6 6 9	0.0					
28					very loose med/brown fine sand	28.0		saturated
	1.0	1 3 2 4	0.0					
30					loose/stiff med brown/gray fine sand	30.0		wet
	1.4	3 1 2 14	0.0					
32					stiff med brown/gray fine sand w/ trace silt	32.0		moist
	2.0	12 20 61 50	0.0					
34					dense med red brown silty clay (interbedded silt layers)	33.5		
	1.5	3 2 4 5	0.0		very loose med/light brown fine sand	34.0		34.5 wet
36					loose to stiff med/light brown fine sand w/ trace silt	36.0		36.5 wet
	1.7	6 9 15 21	0.0					
38					loose to stiff med brown fine sand	38.0		38.5 saturated
	2.0	11 5 7 8	0.0					
40					loose to stiff med brown fine/med sand	40.0		saturated
	1.0	5 4 7 17	0.0					
42					stiff med brown fine sand	42.0		saturated
	2.0	13 15 20 21	0.0					
44					stiff to dense med/dark gray/brown fine sand w trace sub round gravel	44.0		moist soil sample collected 44-46'
	2.0	19 11 50/2	0.0					

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-21D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **3** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	2.0	18 17 15 11	0.0		loose to stiff med red brown sandy clay with 1/2" gravel till (strong plasticity)	46.0		wet
48	1.5	14 14 25 50/3	0.0		very dense light gray fine sandy clay and silt w/ gravel till	48.0	48.5 49.0 49.5	wet end of boring 49.5'
						50.0		

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-21S

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **2**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/13/09**	
DRILL RIG TYPE **D-50**	TYPE				DATE FINISHED **5/13/09**	
GROUND WATER DEPTH **12.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					cut 24" circular hole through asphalt and course gravel			
2					hand cleared - loose med brown fine sand	1.0	2.0	
4								
6	1.0	11 12	0.9		very loose med brown fine sand (quartz)	5.0		dry
	1.5	17 16 18 20	2.0		loose med/dark brown gray fine sand	6.0		dry
8	1.2	11 17 35 62	0.3		firm to dense med gray brown fine sand w/ trace silt	8.0	9.0	
10	1.6	14 40 50/4	0.2		dense med gray brown fine sand w/ trace silt	10.0	11.0	moist
12	1.3	10 16 25 25	0.0		loose med/dark gray med sand w/ trace sub round gravel ~0.1" diameter	12.0	13.5	wet
14	1.8	10 12 17 22	0.0		very loose med gray med/coarse sand	14.0		wet
16	1.6	3 2 6 12	0.1		loose med/dark gray med/coarse sand w/ trace fine sand	16.0		saturated
18	1.8	6 12 17 20	0.4		loose med brown gray fine to med sand	18.0		saturated

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-21S
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **2** OF **2**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	1.8	3 6 8 11	0.0		med dense med brown fine to med sand	20.0		saturated
22	1.8	2 5	0.0		very loose med/dark brown fine sand w/ med sand and silt	22.0		saturated
	1.7	2 2 8 5	0.0			23.5	23.5	saturated end of boring 23.5'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-22D

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **3**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/14/09**	
DRILL RIG TYPE **D-50/D-120**	TYPE				DATE FINISHED **5/14/09**	
GROUND WATER DEPTH **11.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					cut 24" circular hole in asphalt/gravel			1.0
2					loose light orange brown fine sand w/ trace dark brown/black fine sand	1.0		
					dense dark red brown clay	3.0		dry
4					loose light orange brown fine sand	3.5		
	1.0	15 15	0.0		loose med/dark gray/brown fine sand	5.0		dry
6	1.7	21 25 23 19	0.0		firm med/light brown/gray fine sand w/ some orange oxidation bands(0.2" thick) w/ trace sub round gravel	6.0		dry
8	1.6	12 16 17 16	0.0		firm med/dark gray/brown fine sand	8.0		moist
10	1.6	23 22 27 31	0.0		a/a	10.0		moist/wet ▼
12	1.6	12 15 18 22	12.0		a/a	12.0		moist/wet
14	1.4	10 15 19 22	10.6		firm med gray fine sand	14.0		saturated
16	2.0	3 3 13 28	25		firm to loose med gray fine sand	16.0		saturated
18	1.5	3 9 18 21	15.0		firm med/dark gray fine/med sand	18.0		saturated soil sample collected 18-20'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-22D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **2** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	2.0	6 13 24 35	9.9		a/a	20.0		saturated
22	1.5	5 9 14 17	10.6		loose to firm med/dark gray med/fine sand w/ trace orange med sand	22.0		saturated
24	1.7	7 15 20 20	11.9		loose to firm med/dark gray med/coarse sand w/ firm med/light brown fine sand	24.0		saturated
26	1.7	4 5 8 13	18.8		loose to firm med/light brown fine sand w/ some med gray fine/med sand	26.0		saturated
28	1.5	7 12 15 19	13.1		loose to firm med/light brown fine sand	28.0		saturated
30	1.5	7 10 15 19	14		loose med gray med sand w/ some fine sand	30.0		saturated
32	1.8	6 13 18 20	0.0		loose to firm dark gray coarse sand and gravel (~0.2" diameter) 4" layer of firm light brown sand w/ some silt	32.0		saturated
34	2.0	11 22 22 22	0.0		firm to loose med gray/brown fine sand (34-35') firm to dense light brown fine silty sand w/ trace reddish brown clay (35-36')	34.0	34.0 36.0	saturated
36	2.0	5 8 13 18	1.8		firm med/light brown fine sand	36.0	38.0	wet
38	1.8	3 5 11 9	0.0		firm med/dark gray brown fine sand	38.0		wet
40	2.0	5 6 11 11	0.0		firm to loose med gray brown fine sand	40.0		wet
42	1.0	8 2 15 12	0.0		dense to firm med/dark brown gray med/fine sand	42.0		wet
44	1.6	5 5 6 6	4.0		loose med/dark gray/brown med/fine sand	44.0		wet soil sample collected 46-48'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-22D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **3** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	2.0	4679	3.9		loose med/light gray fine sand and silt w/ gravel till	46.0		wet
48	1.0	refusal	0.0		dense med/light gray fine sand and silt w/ gravel till (encountered bedrock refusal at 50')	48.0	48.0	wet end of boring 48'
						50.0	50.0	

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-22S

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **1**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/15/09**	
DRILL RIG TYPE **D-120**	TYPE				DATE FINISHED **5/15/09**	
GROUND WATER DEPTH **11.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					cut 24" circular hole in asphalt/gravel			1.0
2					loose light orange brown fine sand w/ trace dark brown/black fine sand	1.0		3.0
					dense dark red brown clay	3.0		dry
4					loose light orange brown fine sand	3.5		5.0
	1.0	15 15	0.0		loose med/dark gray/brown fine sand	5.0		dry
6	1.7	21 25 23 19	0.0		firm med/light brown/gray fine sand w/ some orange oxidation bands(0.2" thick) w/ trace sub round gravel	6.0		dry 7.7
8	1.6	12 16 17 16	0.0		firm med/dark gray/brown fine sand	8.0		moist
10	1.6	23 22 27 31	0.0		a/a	10.0		moist/wet
12	1.6	12 15 18 22	12.0		a/a	12.0		moist/wet
14	1.4	10 15 19 22	10.6		firm med gray fine sand	14.0		saturated
16	2.0	3 3 13 28	25		firm to loose med gray fine sand	16.0		saturated 17.7
18	1.5	3 9 18 21	15.0			18.0		18.0 saturated end of boring 18'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-23D

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **3**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/18/09**	
DRILL RIG TYPE **D-120**	TYPE				DATE FINISHED **5/19/09**	
GROUND WATER DEPTH **11.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					fill as c&d debris with brick & stone			
2								2.0
4								
	0.8	50/2	0.0		a/a	5.0		dry
6	1.5	9 12 14 12	4.1		firm to loose med brown fine sand	6.0		dry
8	1.8	13 13 15 15	0.7		firm med brown fine sand w/ orange brown fine sand layers ~ 0.02" thick at ~10'	8.0		moist
10	1.2	17 24 30 34	4.4		firm to loose med/dark brown fine/med sand w/ dark brown sand layers at ~10.5'	10.0		dry ▼
12	1.6	10 10 28 33	2.0		firm med/dark brown fine/med sand	12.0		saturated
14	1.8	9 25 35 40	2.0		a/a	14.0		saturated
16	1.7	23 37 50/4	2.4		firm med brown fine sand w/ trace silt	16.0		saturated
18	2.0	21 40 50/4	1.8		firm med brown fine sand	18.0		wet soil sample collected 18-20'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-23D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **2** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
	1.9	25 32 50/3	2.0		firm to dense med brown fine sand w/ med/dark gray brown med/coarse sand	20.0		saturated
22	2.0	25 57 50/2	2.0		firm to dense med brown fine sand w/ med/dark gray/brown med/coarse sand	22.0		saturated
24	2.0	5 17 35 50/4	2.0		24-25' - firm to dense med brown fine sand 25-25.5' - loose med/dark gray/brown course sand	24.0		saturated
26	2.0	3 4 24 26	0.9		25.5-26' - firm to dense med brown fine sand w/ trace red brown interbedded sandy clay layers ~0.01" thick w/ trace sub round gravel ~0.01" diameter	26.0		wet
28	2.0	26 28 38 40	1.3		firm to dense med brown fine sand w/ trace sub round gravel ~0.5" diameter & trace red brown sandy clay 28-29' - loose med brown med sand	28.0		wet
30	2.0	7 14 35 35	0.0		29-30' - firm to stiff med/dark brown fine sand w/ some dense red brown sandy clay & trace gravel ~0.3" diameter loose to firm med brown fine sand	30.0		wet
32	2.0	8 16 40 50/3	1.0		31.5' - firm to stiff med/dark gray/brown sand & gravel ~0.2" diameter loose to firm med gray/brown coarse sand & sub round gravel ~ 0.3" diameter w/ trace red brown clay	32.0		wet
34	1.8	26 40 50 53	0.4		firm to stiff med/light brown find silty sand	34.0		saturated
36	1.8	6 9 20 50/3	0.0		a/a	36.0		saturated
38	1.8	4 10	0.4		loose med gray/brown fine sand	38.0		saturated
40	1.8	3 3 10 18	0.0		a/a	40.0		saturated
42	0				lost sample	42.0		
44	2.0	23 27 50/4	0.0		firm med gray/brown fine sand w/ trace gravel ~0.02" diameter w/ trace orange brown oxidation bands	44.0		moist soil sample collected 44-46'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-23D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **3** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	2.0	40 25 25 40	0.3		loose to dense med gray brown fine and & gravel w/ dense red/brown sandy clay w/ some sub round gravel ~0.2" diameter (till)	46.0		moist
48	1.0	25 40 50/4	0.2		dense to stiff med red brown sandy clay w/ sub round gravel ~1" diameter (bedrock)	48.0 49.0	48.3 48.5 49.0	moist end of boring 48'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-23S

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **1**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/19/09**	
DRILL RIG TYPE **D-120**	TYPE				DATE FINISHED **5/19/09**	
GROUND WATER DEPTH **11.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					fill as c&d with brick & stone			
2							2.0	
4							5.0	
	0.8	50/2	0.0		a/a	5.0		dry
6	1.5	9 12 14 12	4.1		firm to loose med brown fine sand	6.0	7.0	dry
8	1.8	13 13 15 15	0.7		firm med brown fine sand w/ orange brown fine sand layers ~ 0.02" thick at ~10'	8.0	9.0	moist
10	1.2	17 24 30 34	4.4		firm to loose med/dark brown fine/med sand w/ dark brown sand layers at ~10.5'	10.0		dry ▼
12	1.6	10 10 28 33	2.0		firm med/dark brown fine/med sand	12.0		saturated
14	1.8	9 25 35 40	2.0		a/a	14.0		saturated
16	1.7	23 37 50/4	2.4		firm med brown fine sand w/ trace silt	16.0		saturated
18	2.0	21 40 50/4	1.8					wet
							19.0 19.5	
						19.5		end of boring 19.5'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-24D

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **3**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/20/09**	
DRILL RIG TYPE **D-120**	TYPE				DATE FINISHED **5/20/09**	
GROUND WATER DEPTH **11.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					cut 24" circular hole through asphalt and gravel (fill, concrete & topsoil)			
2					loose med/light orange brown fine sand	1.0	2.0	
4	1.5	9 13 15	0.2		loose med/light gray tan fine sand	4.5		dry
6	1.6	16 18 22 22	0.2		loose med/light gray brown fine sand	6.0		dry
8	1.7	19 28 28 30	0.0		firm med brown fine sand w/ 2" dense red brown clay lens (perched saturation)	8.0		wet
10	1.7	20 25 27 25	10.4		loose med/dark brown fine sand	10.0		moist soil sample collected 10-12'
12	1.8	5 7 9 7	0.0		loose med/dark brown fine/med sand	12.0		saturated
14	1.8	9 15 19 20	0.0		a/a	14.0		wet
16	2.0	7 9 13 20	0.0		loose to firm med/dark gray brown med sand	16.0		wet
18	0.8	2 3 6 6	0.0		loose med/dark gray/brown sand	18.0		wet

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-24D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **2** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	1.5	3 3 9 14	0.1		a/a	20.0		wet
22	1.6	8 11 15 24	0.0		a/a	22.0		wet
24	1.2	13 11 11 11	0.0		loose to firm light brown fine sand	24.0		wet
26	1.8	6 12 18 20	0.0		26-27' - loose med/dark brown med sand 27-27.2' - firm med/dark red brown sandy clay 27.2-28' - firm med/light brown fine sand	26.0		wet
28	2.0	7 12 20 24	0.0		loose to firm med brown fine sand w/ trace silt at 29'	28.0		wet
30	1.7	4 8 12 13	0.0		loose to firm med/light brown fine silty sand	30.0		wet
32	1.5	3 9 16 14	0.0		loose med brown fine sand	32.0		wet
34	2.0	4 10 15 16	0.0		a/a	34.0	34.5	wet
36	2.0	6 12 18 33	0.0		firm med brown fine sand w/ dense red brown sandy clay from 37.5 to 37.8'	36.0	36.5	wet
38	1.9	8 12 17 33	0.0		firm med/dark gray brown fine/med sand w/ dense red brown sandy clay from 39.5 to 39.9'	38.0	38.5	wet
40	2.0	9 28 50/3	0.0		firm med/dark gray brown med sand w/ trace sub round gravel ~ 0.5" diameter	40.0		wet
42	1.1	10 16 20 22	0.0		loose to firm med gray/brown fine/med sand	42.0		wet
44	2.0	3 4 12 16	0.0		loose to firm med gray/brown fine/med sand w/ trace orange brown oxidation bands~0.2" thick	44.0		wet soil sample collected 44-46' (ms/msd)

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-24D
PROJECT **275 Franklin St**	LOCATION **Buffalo NY**	SHEET **3** OF **3**
CLIENT **NYSDEC**		PROJECT No. **0266377**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	1.8	19 24 24 27	0.0		46-47.6' - firm to stiff med/dark gray brown fine sand 47.6-48' - firm to dense med red brown sandy clay (till)	46.0		wet
48	2.0	12 37 37 50/3	0.0		dense med red brown sandy clay w/ trace sub round gravel bedrock at 50'	48.0		48.5 49.5 50.0
						50.0		end of boring 50'

MALCOLM PIRNIE	TEST BORING LOG	BORING No.MW-OS-24S

PROJECT **275 Franklin St**	LOCATION **Buffalo NY**				SHEET **1** OF **1**	
CLIENT **NYSDEC**					PROJECT No. **0266377**	
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE **MW Installation**					GROUND ELEV.	
WELL MATERIAL					DATUM	
DRILLING METHOD(S)		SAMPLE	CORE	CASING	DATE STARTED **5/21/09**	
DRILL RIG TYPE **D-120**	TYPE				DATE FINISHED **5/21/09**	
GROUND WATER DEPTH **11.0'**	DIA.	"			DRILLER **Larry Schroeder**	
MEASURING POINT	WEIGHT	#			PIRNIE STAFF **Dwight Symonds**	
DATE OF MEASUREMENT	FALL	"				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
					cut 24" circular hole through asphalt and gravel (fill, concrete & topsoil)			1.0
2					loose med/light orange brown fine sand	1.0		
4								
	1.5	9 13 15	0.2		loose med/light gray tan fine sand	4.5		5.0 dry
6	1.6	16 18 22 22	0.2		loose med/light gray brown fine sand	6.0		dry 7.0
8	1.7	19 28 28 30	0.0		firm med brown fine sand w/ 2" dense red brown clay lens (perched saturation)	8.0		wet 9.0
10	1.7	20 25 27 25	10.4		loose med/dark brown fine sand	10.0		moist
12	1.8	5 7 9 7	0.0		loose med/dark brown fine/med sand	12.0		saturated
14	1.8	9 15 19 20	0.0		a/a	14.0		wet
16	2.0	7 9 13 20	0.0		loose to firm med/dark gray brown med sand	16.0		wet
18	0.8	2 3 6 6	0.0		loose med/dark gray/brown sand	18.0		wet 19.0
						19.0		end of boring 19'

DATE
START 9/27/2012
FINISH 9/27/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. MW-25S
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: Offsite Monitoring Well Installations
PROJ. NO.: BEV-12-057
LOCATION: 250 Franklin Street
Buffalo, New York

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID	SOIL OR ROCK CLASSIFICATION	NOTES
								Hand Cleared to 4 Feet Below Ground Surface	PID- Photoionization Detector; Readings Measured in Parts Per Million (ppm)
5		1	4	3				loose tan-brown fine sand, trace silt, moist	
			3	5		6	BG		BG- Background; <1 ppm
		2	8	7				firm	
			7	8		14	BG		
		3	4	5					
10			7	8		12	BG		
		4	6	5			1.0		
			6	6		11	0.5	wet	
		5	4	4			2.0	loose, contains orange bands from 13.3' to 14.0'	
			5	7		9	1.5		
15		6	1	3			1.0		
			4	5		7	1.0		
		7	6	6			2.0	(firm)	
			8	9		14	2.0		
		8	2	5			5.0	contains orange staining from 19.7' to 19.9'	
20			7	9		12	9.0		
								Test Boring Completed at 20 Feet Below Ground Surface	Installed 2" PVC Well. Refer to attached well diagram.
25									
									Free-standing water recorded at 12.3 feet after well installation
30									
35									
40									

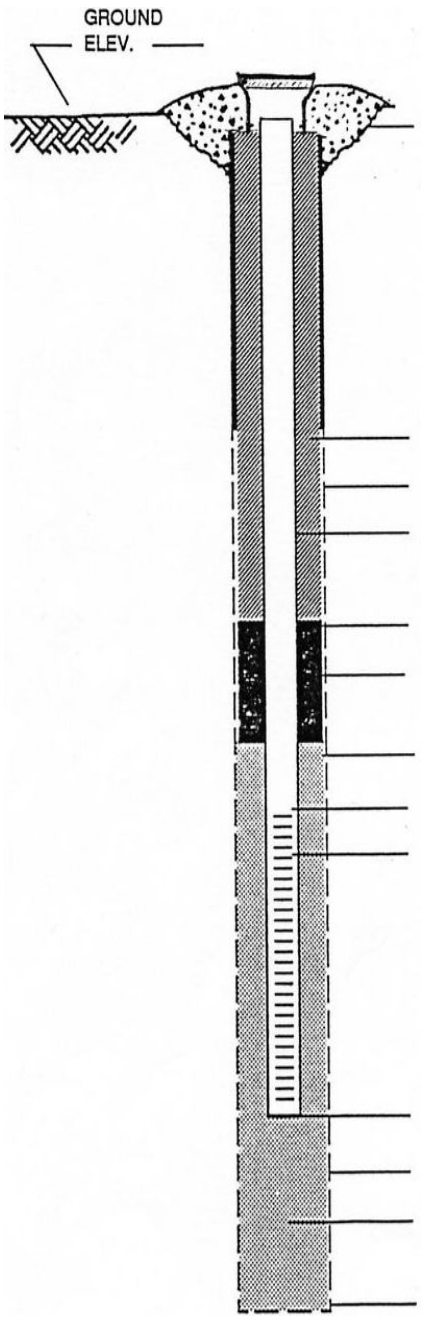
N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW
CLASSIFIED BY: Geologist

DRILLER: S. GORSKI
DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD

PROJECT: **Offsite Wells - 250 Franklin St., Buffalo**	
PROJECT NUMBER: BEV-12-057	DRILLING METHOD: Hollow-stem augers
WELL NUMBER: MW-25S	GEOLOGIST: D. Steiner
DRILLER: S. Gorski	INSTALLATION DATE(S): 9/27/2012



TOP OF WELL RISER PIPE: 0.3 foot

TYPE OF SURFACE SEAL: Concrete

TYPE OF BACKFILL: Cement/bentonite grout

BOREHOLE DIAMETER: 8 inches

I.D. OF RISER PIPE: 2 inches

TYPE OF RISER PIPE: Schedule 40 PVC

DEPTH OF SEAL: 5.1 feet

TYPE OF SEAL: Bentonite Chips

DEPTH OF SAND PACK: 7.6 feet

DEPTH OF TOP OF SCREEN: 9.1 feet

TYPE OF SCREEN: Schedule 40 PVC

SLOT SIZE X LENGTH: 0.01 inch x 10 feet

I.D. OF SCREEN: 2 inches

TYPE OF SAND PACK: No. 1 Silica Sand

DEPTH BOTTOM OF SCREEN: 19.1 feet

DEPTH BOTTOM OF SAND PACK: 19.1 feet

TYPE OF BACKFILL BELOW OBSERVATION WELL: Native Soils

ELEVATION/ DEPTH OF HOLE: 20.0 feet

DATE
START 9/26/2012
FINISH 9/26/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. MW-26S
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: Offsite Monitoring Well Installations
PROJ. NO.: BEV-12-057
LOCATION: 250 Franklin Street
Buffalo, New York

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID	SOIL OR ROCK CLASSIFICATION	NOTES
								Hand Cleared to 4 Feet Below Ground Surface	PID- Photoionization Detector; Readings Measured in Parts Per Million (ppm)
5		1	6	9				firm tan-brown fine sand, trace subround gravel,	
			8	6		17	BG	trace silt, moist	BG- Background; <1 ppm
		2	4	3				loose	
			3	4		6	BG		
		3	5	10				firm, becomes light brown	
10			13	14		23	BG		
		4	3	7				moist- wet	
			12	12		19	BG		
		5	12	14				wet	
			13	17		27	BG		
15		6	6	6					
			6	7		13	BG		Drilling Notes Running Sands at 16 Feet Below Ground Surface
		7	7	9				becomes brown	
			12	14		21	BG		
		8	2	5					
20			7	11		12	BG		
								Test Boring Completed at 20 Feet Below Ground Surface	Free Standing Water Measured at 13.3 Feet Below Ground Surface at Boring Completion
25									
									Installed 2" PVC Well. Refer to attached well diagram.
30									
35									
40									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

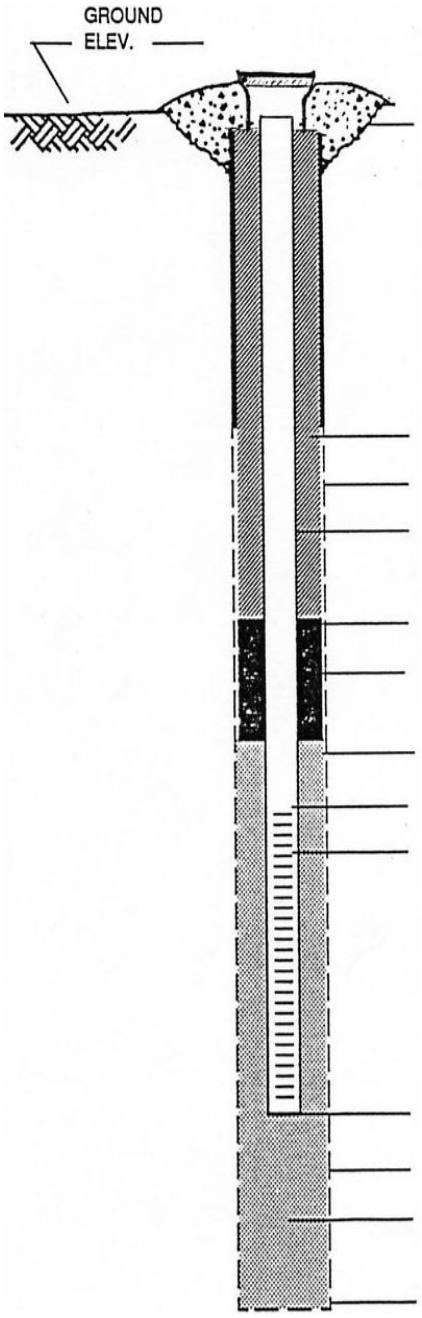
DRILLER: S. GORSKI

DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD

PROJECT: **Offsite Wells - 250 Franklin St., Buffalo**	
PROJECT NUMBER: BEV-12-057	DRILLING METHOD: Hollow-stem augers
WELL NUMBER: MW-26S	GEOLOGIST: S. Bochenek
DRILLER: S. Gorski	INSTALLATION DATE(S): 9/26/2012



TOP OF WELL RISER PIPE:	0.3 foot
TYPE OF SURFACE SEAL:	Concrete
TYPE OF BACKFILL:	Cement/bentonite grout
BOREHOLE DIAMETER:	8 inches
I.D. OF RISER PIPE:	2 inches
TYPE OF RISER PIPE:	Schedule 40 PVC
DEPTH OF SEAL:	4.8 feet
TYPE OF SEAL:	Bentonite Chips
DEPTH OF SAND PACK:	6.8 feet
DEPTH OF TOP OF SCREEN:	8.8 feet
TYPE OF SCREEN:	Schedule 40 PVC
SLOT SIZE X LENGTH:	0.01 inch x 10 feet
I.D. OF SCREEN:	2 inches
TYPE OF SAND PACK:	No. 1 Silica Sand
DEPTH BOTTOM OF SCREEN:	18.8 feet
DEPTH BOTTOM OF SAND PACK:	18.8 feet
TYPE OF BACKFILL BELOW OBSERVATION WELL:	Native Soils
ELEVATION/ DEPTH OF HOLE:	20.0 feet

DATE
START 9/26/2012
FINISH 9/26/2012
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. MW-27S
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: Offsite Monitoring Well Installations
PROJ. NO.: BEV-12-057
LOCATION: 250 Franklin Street
Buffalo, New York

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID	SOIL OR ROCK CLASSIFICATION	NOTES
								Hand Cleared to 4 Feet Below Ground Surface	PID- Photoionization Detector; Readings Measured in Parts Per Million (ppm)
5		1	5	5				firm tan-brown fine sand, trace silt, moist	
			6	7		11	BG		BG- Background; <1 ppm
		2	5	4				loose, becomes brown, occasional fine to medium	
			3	2		7	BG	sand seams	
		3	2	2				becomes light brown	
10			2	2		4	BG		
		4	3	7				firm	
			10	13		20	BG		
		5	6	5				loose, grades to fine to coarse sand, wet	
			4	5		9	BG		
15		6	WH	4				firm brown fine to coarse sand, trace silt, wet	
			6	9		10	BG		Drilling Notes Running Sands at 16 Feet Below Ground Surface
		7	10	14				contains trace subround gravel	
			15	14		29	BG		
		8	4	7					
20			9	13		16	BG		
								Test Boring Completed at 20 Feet Below Ground Surface	Free Standing Water Measured at 3.2 Feet Below Ground Surface at Boring Completion
25									
									Installed 2" PVC Well. Refer to attached well diagram.
30									
35									
40									

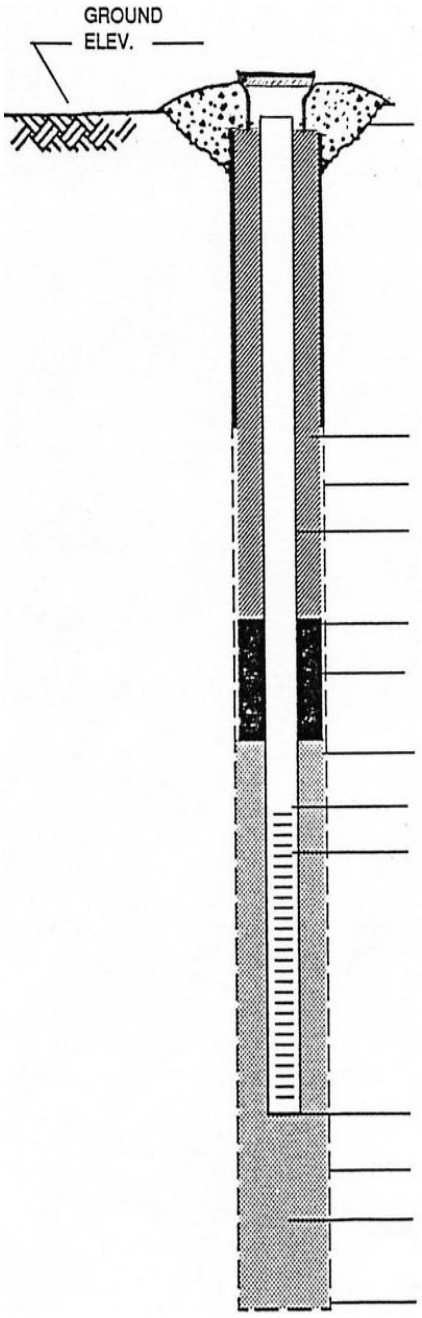
N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: S. GORSKI DRILL RIG TYPE : CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD

PROJECT: **Offsite Wells - 250 Franklin St., Buffalo**	
PROJECT NUMBER: BEV-12-057	DRILLING METHOD: Hollow-stem augers
WELL NUMBER: MW-27S	GEOLOGIST: S. Bochenek
DRILLER: S. Gorski	INSTALLATION DATE(S): 9/26-27/2012



TOP OF WELL RISER PIPE: 0.3 foot

TYPE OF SURFACE SEAL: Concrete

TYPE OF BACKFILL: Cement/bentonite grout

BOREHOLE DIAMETER: 8 inches

I.D. OF RISER PIPE: 2 inches

TYPE OF RISER PIPE: Schedule 40 PVC

DEPTH OF SEAL: 5.1 feet

TYPE OF SEAL: Bentonite Chips

DEPTH OF SAND PACK: 7.1 feet

DEPTH OF TOP OF SCREEN: 9.1 feet

TYPE OF SCREEN: Schedule 40 PVC

SLOT SIZE X LENGTH: 0.01 inch x 10 feet

I.D. OF SCREEN: 2 inches

TYPE OF SAND PACK: No. 1 Silica Sand

DEPTH BOTTOM OF SCREEN: 19.1 feet

DEPTH BOTTOM OF SAND PACK: 19.1 feet

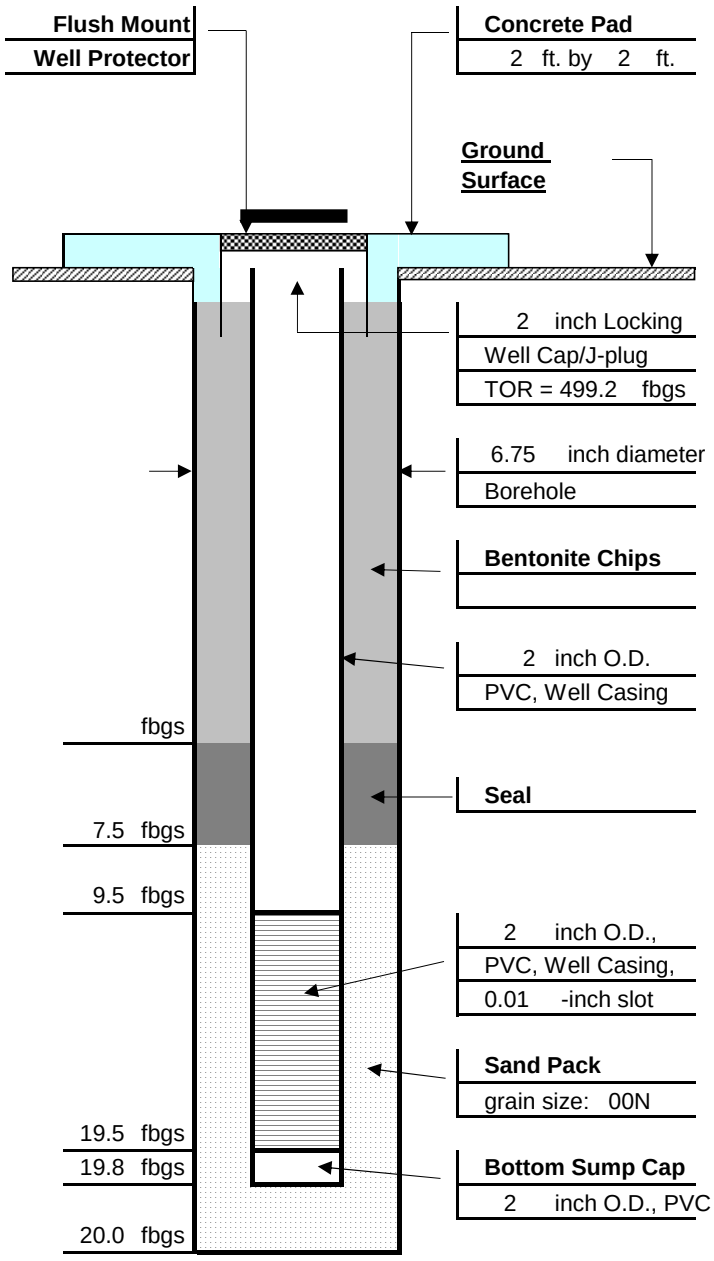
TYPE OF BACKFILL BELOW OBSERVATION WELL: Native Soils

ELEVATION/ DEPTH OF HOLE: 20.0 feet

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT WELL COMPLETION DETAIL

Project Name:	**275 Franklin Street Site**	WELL NUMBER:	**MW-5R**
Client:	**Buffalo Development Corporation**	Date Installed:	**01/18/17**
Boring Location:	**275 Franklin Street Site**	Project Number:	**B0156-016-002**



Driller Information

Company:	Nature's Way Environmental
Driller:	Nate
Helper:	Karl
Permit Number:	
Drill Rig Type:	Hollow-Stem Auger

Well Information

Land Surface Elevation:	*499.50*	fmsl (approximate)
Drilling Method:	Hollow-Stem Auger	
Soil Sample Collection Method:	NA	
Drilling Fluid:	*water*	
Fluid Loss During Drilling:	*0*	gallons (approximate)

Material of Well Construction

Casing:	PVC
Screen:	Perforated PVC
Sump:	PVC
Sand Pack:	*00N (Silica)*
Annular Seal:	Cetco Medium Bentonite Chips

Well Development

Well Purpose:	Groundwater Monitoring	
Technique(s):	2" PVC Bailer	
Date Completed:	1/20/2017	
BM/TK Personnel:	Charlotte Clark	
Total Volume Purge:	11	gallons
Static Water Level (SWL):	12	fbTOR
Pump Depth:	bottom of well	
Purge Duration:	100	minutes
Yield:		gpm
Specific Capacity:		gpm/ft

Comments:

PREAPRED BY: CMC DATE: 1/18/2017

APPENDIX E

FIELD OPERATING PROCEDURES

BENCHMARK
ENVIRONMENTAL
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SCIENCE, PLLC

FIELD OPERATING PROCEDURES

Groundwater Level Measurement

FOP 022.0

GROUNDWATER LEVEL MEASUREMENT

PURPOSE

This procedure describes the methods used to obtain accurate and consistent water level measurements in monitoring wells, piezometers and well points. Water levels will be measured at monitoring wells and, if practicable, in supply wells to estimate purge volumes associated with sampling, and to develop a potentiometric surface of the groundwater in order to estimate the direction and velocity of flow in the aquifer. Water levels in monitoring wells will be measured using an electronic water level indicator (e-line) that has been checked for operation prior to mobilization.

PROCEDURE

1. Decontaminate the e-line probe and a lower portion of cable following the procedures referenced in the Benchmark Field Operating Procedure for Non-Disposable and Non-Dedicated Sampling Equipment Decontamination. Store the e-line in a protected area until use. This may include wrapping the e-line in clean plastic until the time of use.

2. Unlock and remove the well protective cap or cover and place on clean plastic.

3. Lower the probe slowly into the monitoring well until the audible alarm sounds. This indicates the depth to water has been reached.

4. Move the cable up and down slowly to identify the depth at which the alarm just begins to sound. Measure this depth against the mark on the lip of the well riser used as a surveyed reference point (typically the north side of the riser).

5. Read depth from the graduated cable to the nearest 0.01 foot. Do not use inches. If the e-line is not graduated, use a rule or tape measure graduated in 0.01-foot increments to measure from the nearest reference mark on the e-line cable.

6. Record the water level on a Water Level Monitoring Record (sample attached).

7. Remove the probe from the well slowly, drying the cable and probe with a clean paper wipe. Be sure to repeat decontamination before use in another well.

8. Replace well plug and protective cap or cover. Lock in place as appropriate.

ATTACHMENTS

Water Level Monitoring Record (sample)

REFERENCES

Benchmark FOPs:
040 Non-Disposable and Non-Dedicated Sampling Equipment Decontamination

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

WATER LEVEL MONITORING RECORD

Project Name:	Client:
Project No.:	Location:
Field Personnel:	Date:
Weather:	

Well No.	Time	Top of Riser Elevation (fmsl)	Static Depth to Water (fbTOR)	Groundwater Elevation (fmsl)	Total Depth (fbTOR)	Last Total Depth Measurement (fbTOR)

Comments/Remarks:

SAMPLE

PREAPRED BY: DATE:

BENCHMARK
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FIELD OPERATING PROCEDURES

Groundwater Purging Procedures Prior to Sample Collection

FOP 023.1

GROUNDWATER PURGING PROCEDURES PRIOR TO SAMPLE COLLECTION

PURPOSE

This procedure describes the methods for monitoring well/piezometer purging prior to groundwater sample collection in order to collect representative groundwater samples. The goal of purging is to remove stagnant, non-representative groundwater from the well and/or prevent stagnant water from entering collected samples. Purging involves the removal of at least three to five volumes of water in wells with moderate yields and at least one well volume from wells with low yields (slow water level recovery).

Purge and sample wells in order of least-to-most contaminated (this is not necessary if dedicated or disposable equipment is used). If you do not know this order, sample the upgradient wells first, then the furthest down-gradient or side-gradient wells, and finally the wells closest to, but down-gradient of the most contaminated area. Sampling should commence immediately following purging or as soon as the well has adequately recharged and not more than 24-hours following end time of evacuation.

PROCEDURE

1. Prepare the electronic water level indicator (e-line) in accordance with the procedures referenced in the Benchmark Field Operating Procedure for Groundwater Level Measurement and decontaminate the e-line probe and a lower portion of cable following the procedures referenced in the Benchmark Field Operating Procedure for Non-disposable and Non-dedicated Sampling Equipment Decontamination. Store the e-line in a protected area until use. This may include wrapping the e-line in clean plastic until the time of use.

2. Inspect the interior and exterior of the well/piezometer for signs of vandalism or damage and record condition on the Groundwater Field Form and/or Groundwater Well Inspection Form (samples attached). Specifically, inspect

the integrity of the following: concrete surface seal, lock, protective casing and well cover, well riser and J-plug/cap. Report any irregular findings to the Project Manager.

3. Unlock and remove the well protective cap or cover and place on clean plastic to avoid introducing foreign material into the well.

4. Calibrate the photoionization detector (PID) in accordance with the Benchmark Field Operating Procedure for Calibration and Maintenance of Portable Photoionization Detector.

5. Monitor the well for organic vapors using a PID, as per the Work Plan. If a reading of greater than 5 ppm is recorded, the well should be allowed to vent until levels drop below 5 ppm before proceeding with purging.

6. Lower the e-line probe slowly into the monitoring well and record the initial water level in accordance with the procedures referenced in the Benchmark Field Operating Procedure for Groundwater Level Measurement.

7. Following static water level determinations, slowly lower the e-line to the bottom of the well/piezometer. Record the total depth to the nearest 0.01-foot and compare to the previous total depth measurement. If a significant discrepancy exists, re-measure the total depth. Continue with purging activities observing purge water to determine whether the well/piezometer had become silted due to inactivity or damaged (i.e., well sand within purge water). Upon confirmation of the new total depth and determination of the cause (i.e., siltation or damage), notify the Project Manager following field activities.

8. Calculate the volume of water in the well based on the water level below the top of riser and the total depth of the well using the following equation:

$$V = 0.0408[(B)^2 \times \{(A) - (C)\}]$$

Where,

A = Total Depth of Well (feet below measuring point)
B = Casing diameter (inches)
C = Static Water Level (feet below measuring point)

9. **For wells where the water level is 20 feet or less below the top of riser**, a peristaltic pump may be used to purge the well. Measure the purged volume using a calibrated container (i.e., graduated 5-gallon bucket) and record measurements on the attached Groundwater Well Development and Purge Log. Use new and dedicated tubing for each well. During the evacuation of shallow wells, the intake opening of the pump tubing should be positioned just below the surface of the water. As the water level drops, lower the tubing as needed to maintain flow. For higher yielding wells, the intake level should not be lowered past the top of the screen. Pumping from the top of the water column will ensure proper flushing of the well. Continue pumping until the required volumes are removed (typically three well volumes). For higher yielding wells, adjust the purging rate to maintain the water level above the screen. For lower yielding wells or wells where the screen straddles the water table, maintain purging at a rate that matches the rate of recovery of the well (well yield). If the well purges to dryness and is slow to recharge (greater than 15 minutes), terminate evacuation. **A peristaltic pump and dedicated tubing cannot be used to collect VOC or SVOC project-required samples; only non-organic compounds may be collected using this type of pump.**

10. **For wells where the water level is initially below 20 feet,** or drawn down to this level because of slow recharge rate, conduct purging using one of three devices listed below:

- Bailer – A bottom filling dedicated polyethylene bailer attached to a length of dedicated hollow-braid polypropylene rope. Purging a well utilizing a bailer should be conducted smoothly and slowly as not to agitate the groundwater or damage the well.

- Well Wizard Purge Pump (or similar) – This pneumatic bladder pump uses compressed air to push water to the surface. Groundwater is not in contact

with the drive air during the pumping process, therefore the pump may be used for sample collection.

- Submersible Pump (12 or 24 volt, or similar) – These submersible pumps are constructed of PVC or stainless steel and are capable of pumping up to 70 feet from ground surface using a 12 volt battery (standard pump) and standard low flow controller. For depths up to 200 feet from ground surface, a high performance power booster controller is used with a 12 volt battery. Unless these pumps are dedicated to the monitoring well location, decontamination between locations is necessary and an equipment blank may be required.

- Waterra™ Pump – This manually operated pump uses dedicated polyethylene tubing and a check valve that can be used as an optional method for purging deeper wells. The pump utilizes positive pressure to evacuate the well, therefore the pump may be used for sample collection, and however over-agitation groundwater should be avoided.

Prior to use in a well, non-dedicated bailers, exterior pump bodies and pump tubing should be cleaned in accordance with the Benchmark Field Operating Procedure for Non-Disposable and Non-Dedicated Sampling Equipment Decontamination. Dedicated and/or disposable equipment should be contained within the sealed original manufacturers packaging and certified pre-cleaned by the manufacturer with a non-phosphate laboratory detergent and rinsed using de-ionized water.

8. Purging will continue until a predetermined volume of water has been removed (typically three well volumes) or to dryness. Measurements for pH, temperature, specific conductance, dissolved oxygen (optional), Eh (optional), and turbidity will be recorded following removal of each well volume. Purge the well to dryness or until the readings for indicator parameters listed above (or well-specific indicator parameters) stabilize within the following limits for each parameter measured:

Field Parameter	Stabilization Criteria
Dissolved Oxygen	± 0.3 mg/L
Turbidity	± 10 %
Specific Conductance	± 3 %
Eh	± 10 mV
PH	± 0.1 unit

Stabilization criteria presented within the project Work Plan will take precedence.

DOCUMENTATION AND SAMPLE COLLECTION

This section pertains to the documentation of collected field data during and following purging activities and sample collection.

1. Record all data including the final three stable readings for each indicator parameter on the attached Groundwater Well Purge & Sample Log.

2. Record, at a minimum, the "volume purged," "purging stop-time," "purged dry (Y/N)," "purged below sand pack (Y/N)," and any problems purging on the attached Groundwater Well Purge & Sample Log.

3. Collect groundwater samples in accordance with the Benchmark Field Operating Procedure for Groundwater Sample Collection. Record "sample flow rate" as an average, "time sample collected," and any other pertinent information related to the sampling event on the attached Groundwater Well Purge & Sample Log.

4. Restore the well to its capped/covered and locked condition.

ALTERNATIVE METHODS

Alternative purging and sampling methods and equipment, other than those described herein are acceptable if they provide representative groundwater samples. The purging and sampling method and equipment must not adversely affect sample integrity, chemistry, temperature, and turbidity. In addition, alternative equipment must have minimal or no effect on groundwater geochemistry, aquifer permeability and well materials. Equipment materials must also minimize sorption and leaching. The field team is responsible for documenting and describing any alternative equipment and procedures used to purge a well and collect samples.

ATTACHMENTS

Groundwater Field Form
Groundwater Well Inspection Form

REFERENCES

Benchmark FOPs:

011 *Calibration and Maintenance of Portable Photoionization Detector*
022 *Groundwater Level Measurement*
024 *Groundwater Sample Collection Procedures*
040 *Non-disposable and Non-dedicated Sampling Equipment Decontamination*

GROUNDWATER PURGING PROCEDURES PRIOR TO SAMPLE COLLECTION

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Date:

Location: Project No.: Field Team:

Well No.			Diameter (inches):			Sample Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			Casing Volume:			Purpose: ☐ Development ☐ Sample			
Total Depth (fbTOR):			Purge Volume (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:			Date: (if different from above)						
	S1								
	S2								

Well No.			Diameter (inches):			Sample Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			Casing Volume:			Purpose: ☐ Development ☐ Sample			
Total Depth (fbTOR):			Purge Volume (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:			Date: (if different from above)						
	S1								
	S2								

SAMPLE

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER WELL INSPECTION FORM

Project:	**WELL I.D.:**
Client:	
Job No.:	
Date:	
Time:	

EXTERIOR INSPECTION

Protective Casing:
Lock:
Hinge/Lid:
Concrete Surface Seal:
Bollards:
Label/I.D.:
Other:

INTERIOR INSPECTION

Well Riser:
Annular Space:
Well Cap:
Water Level (fbTOR):
Total Depth (fbTOR):
Other:

Comments/Corrective Actions:

PREPARED BY: DATE:

SAMPLE

BENCHMARK
ENVIRONMENTAL
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FIELD OPERATING PROCEDURES

Groundwater Sample Collection Procedures

FOP 024.1

GROUNDWATER SAMPLE COLLECTION PROCEDURES

PURPOSE

This procedure describes the methods for collecting groundwater samples from monitoring wells and domestic supply wells following purging and sufficient recovery. This procedure also includes the preferred collection order in which water samples are collected based on the volatilization sensitivity or suite of analytical parameters required.

PROCEDURE

Allow approximately 3 to 10 days following well development before performing purge and sample activities at any well location. Conversely, perform sampling as soon as practical after sample purging at any time after the well has recovered sufficiently to sample, or within 24 hours after evacuation, if the well recharges slowly. If the well does not yield sufficient volume for all required laboratory analytical testing (including quality control), a decision should be made to prioritize analyses based on contaminants of concern at the site. If the well takes longer than 24 hours to recharge, the Project Manager should be consulted. The following two procedures outline sample collection activities for monitoring and domestic type wells.

Monitoring Wells

1. Purge the monitoring well in accordance with the Benchmark FOPs for Groundwater Purging Procedures Prior to Sample Collection or Low Flow (Minimal Drawdown) Groundwater Purging & Sampling Procedures. Perform sampling as soon as practical after purging at any time after the well has recovered sufficiently to sample, or within 24 hours after evacuation, if the well recharges slowly. If the well does not yield sufficient volume for all required laboratory analytical testing (including quality control), a decision should be made to prioritize analyses based on contaminants of concern at the site. Analyses will be prioritized in the order of the parameters volatilization sensitivity. After volatile organics have been collected, field parameters

must be measured from the next sample collected. If a well takes longer than 24 hours to recharge, the Project Manager should be consulted.

2. Sampling equipment that is not disposable or dedicated to the well will be decontaminated in accordance with the Benchmark Field Operating Procedure for Non-Disposable and Non-Dedicated Sampling Equipment Decontamination.

3. Calibrate all field meters (i.e., pH/Eh, turbidity, specific conductance, dissolved oxygen, PID etc.) in accordance with the Benchmark Field Operating Procedure for Calibration and Maintenance of the specific field meter.

4. Prepare the electronic water level indicator (e-line) in accordance with the procedures referenced in the Benchmark Field Operating Procedure for Groundwater Level Measurement and decontaminate the e-line probe and a lower portion of cable following the procedures referenced in the Benchmark Field Operating Procedure for Non-disposable and Non-dedicated Sampling Equipment Decontamination. Store the e-line in a protected area until use. This may include wrapping the e-line in clean plastic until the time of use.

5. Inspect the well/piezometer for signs of vandalism or damage and record condition on the Groundwater Field Form (sample attached). Specifically, inspect the integrity of the following: concrete surface seal, lock, protective casing and well cover, well casing and J-plug/cap. Report any irregular findings to the Project Manager.

6. Unlock and remove the well protective cap or cover and place on clean plastic to avoid introducing foreign material into the well.

7. Calibrate the photoionization detector (PID) in accordance with the Benchmark Field Operating Procedure for Calibration and Maintenance of Portable Photoionization Detector.

8. Monitor the well for organic vapors using a PID, as per the Work Plan. If a reading of greater than 5 ppm is recorded, the well should be allowed to vent until levels drop below 5 ppm before proceeding with purging. Record PID measurements on a well-specific Groundwater Field Form (sample attached).

9. Lower the e-line probe slowly into the monitoring well and record the measurement on a well-specific Groundwater Field Form (sample attached).

10. Groundwater samples will be collected directly from the sampling valve on the flow through cell (low-flow), discharge port of a standard pump assembly (peristaltic, pneumatic, submersible, or Waterra™ pump) or bailer (stainless steel, PVC or polyethylene) into appropriate laboratory provided containers. In low-yielding wells at which the flow through cell is not used, the samples may be collected using a disposable bailer.

11. If disposable polyethylene bailers are used, the bailer should be lowered *slowly* below the surface of the water to minimize agitation and volatilization. For wells that are known to produce turbid samples (values greater than 50 NTU), the bailer should be lowered and retrieved at a rate that limits surging of the well.

12. Sampling data will be recorded on a Groundwater Field Form (sample attached).

13. Pre-label all sample bottles in the field using a waterproof permanent marker in accordance with the Benchmark Sample Labeling, Storage, and Shipment FOP. The following information, at a minimum, should be included on the label:

    - Project Number;
    - Sample identification code (as per project specifications);
    - Date of sample collection (mm, dd, yy);
    - Time of sample collection (military time only) (hh:mm);
    - Specify "grab" or "composite" sample type;
    - Sampler initials;
    - Preservative(s) (if applicable); and
    - Analytes for analysis (if practicable).

14. Collect a separate sample of approximately 200 ml into an appropriate container prior to collecting the first and following the last groundwater sample collected to measure the following field parameters:

Parameter	Units
Dissolved Oxygen	parts per million (ppm)

Specific Conductance	μmhos/cm or μS or mS
pH	pH units
Temperature	^{o}C or ^{o}F
Turbidity	NTU
Eh (*optional*)	mV
PID VOCs (*optional*)	ppm

Record all field measurements on a Groundwater Field Form (sample attached).

15. Collect samples into pre-cleaned bottles provided by the analytical laboratory with the appropriate preservative(s) added based on the volatilization sensitivity or suite of analytical parameters required, as designated in the **Sample Collection Order** section below.

16. Lower the e-line probe slowly into the monitoring well and record the measurement on a well-specific Groundwater Field Form (sample attached).

17. The samples will be labeled, stored, and shipped in accordance with the Benchmark Field Operating Procedure for Sample Labeling, Storage, and Shipment Procedures.

Domestic Supply Wells

1. Calculate or estimate the volume of water in the well. It is desirable to purge at least one casing volume before sampling. This is controlled, to some extent, by the depth of the well, well yield and the rate of the existing pump. If the volume of water in the well cannot be calculated, the well should be purged continuously for no less than 15 minutes.

2. Connect a sampling tap to an accessible fitting between the well and the pressure tank where practicable. A hose will be connected to the device and the hose discharge located 25 to 50 feet away. The well will be allowed to pump until the lines and one well volume is removed. Flow rate will be measured with a container of known volume and a stopwatch.

3. Place a clean piece of polyethylene or Teflon™ tubing on the sampling port and collect the samples in the order designated below and in the sample containers supplied by the laboratory for the specified analytes. ***DO NOT*** use standard garden hose to collect samples.

4. Sampling results and measurements will be recorded on a Groundwater Field Form (sample attached) as described in the previous section.

5. Collect samples into pre-cleaned bottles provided by the analytical laboratory with the appropriate preservative(s) added based on the volatilization sensitivity or suite of analytical parameters required, as designated in the **Sample Collection Order** section below.

6. The samples will be labeled, stored, and shipped in accordance with the Benchmark Field Operating Procedure for Sample Labeling, Storage, and Shipment Procedures.

SAMPLE COLLECTION ORDER

All groundwater samples, from monitoring wells and domestic supply wells, will be collected in accordance with the following.

1. Samples will be collected preferentially in recognition of volatilization sensitivity. The preferred order of sampling if no free product is present is:

    - Field parameters
    - Volatile Organic Compounds (VOCs)
    - Purgeable organic carbons (POC)
    - Purgeable organic halogens (POH)
    - Total Organic Halogens (TOX)
    - Total Organic Carbon (TOC)
    - Extractable Organic Compounds (i.e., BNAs, SVOCs, etc.)
    - Total petroleum hydrocarbons (TPH) and oil and grease
    - PCBs and pesticides
    - Total metals (Dissolved Metals)
    - Total Phenolic Compounds

- Cyanide
- Sulfate and Chloride
- Turbidity
- Nitrate (as Nitrogen) and Ammonia
- Preserved inorganics
- Radionuclides
- Unpreserved inorganics
- Bacteria
- Field parameters

2. Document the sampling procedures and related information in the Project Field Book and on a Groundwater Field Form (sample attached).

DOCUMENTATION

The three words used to ensure adequate documentation for groundwater sampling are accountability, controllability, and traceability. Accountability is undertaken in the sampling plan and answers the questions who, what, where, when, and why to assure that the sampling effort meets its goals. Controllability refers to checks (including QA/QC) used to ensure that the procedures used are those specified in the sampling plan. Traceability is documentation of what was done, when it was done, how it was done, and by whom it was done, and is found in the field forms, Project Field Book, and chain-of-custody forms. At a minimum, adequate documentation of the sampling conducted in the field consists of an entry in the Project Field Book (with sewn binding), field data sheets for each well, and a chain-of-custody form.

As a general rule, if one is not sure whether the information is necessary, it should nevertheless be recorded, as it is impossible to over-document one's fieldwork. Years may go by before the documentation comes under close scrutiny, so the documentation must be

capable of defending the sampling effort without the assistance or translation of the sampling crew.

The minimum information to be recorded daily with an indelible pen in the Project Field Book and/or field data sheets includes date and time(s), name of the facility, name(s) of the sampling crew, site conditions, the wells sampled, a description of how the sample shipment was handled, and a QA/QC summary. After the last entry for the day in the Project Field Book, the Field Team Leader should sign the bottom of the page under the last entry and then draw a line across the page directly under the signature.

PRECAUTIONS/RECOMMENDATIONS

The following precautions should be adhered to prior to and during sample collection activities:

- Field vehicles should be parked downwind (to avoid potential sample contamination concerns) at a minimum of 15 feet from the well and the engine turned off prior to PID vapor analysis and VOC sample collection.

- Ambient odors, vehicle exhaust, precipitation, or windy/dusty conditions can potentially interfere with obtaining representative samples. These conditions should be minimized and should be recorded in the field notes. Shield sample bottles from strong winds, rain, and dust when being filled.

- The outlet from the sampling device should discharge below the top of the sample's air/water interface, when possible. The sampling plan should specify how the samples will be transferred from the sample collection device to the sample container to minimize sample alterations.

- The order of sampling should be from the least contaminated to the most contaminated well to reduce the potential for cross contamination of sampling equipment (see the Sampling Plan or Work Plan).

- Samples should not be transferred from one sampling container to another.

- Sampling equipment must not be placed on the ground, because the ground may be contaminated and soil contains trace metals. Equipment and supplies should be removed from the field vehicle only when needed.

- Smoking and eating should not be allowed until the well is sampled and hands are washed with soap and water, due to safety and possibly sample contamination concerns. These activities should be conducted beyond a 15-foot radius of the well.

- No heat-producing or electrical instruments should be within 15 feet of the well, unless they are intrinsically safe, prior to PID vapor analysis.

- Minimize the amount of time that the sample containers remain open.

- Do not touch the inside of sample bottles or the groundwater sample as it enters the bottle. Disposable gloves may be a source of phthalates, which could be introduced into groundwater samples if the gloves contact the sample.

- Sampling personnel should use a new pair of disposable gloves for each well sampled to reduce the potential for exposure of the sampling personnel to contaminants and to reduce sample cross contamination. In addition, sampling personnel should change disposable gloves between purging and sampling operations at the same well.

- Sampling personnel should not use perfume, insect repellent, hand lotion, etc., when taking groundwater samples. If insect repellent must be used, then sampling personnel should not allow samples or sampling equipment to contact the repellent, and it should be noted in the documentation that insect repellent was used.

- Complete the documentation of the well. A completed assemblage of paperwork for a sampling event includes the completed field forms, entries in the Project Field Book (with a sewn binding), transportation documentation (if required), and possibly chain-of-custody forms.

ATTACHMENTS

Groundwater Field Form (sample)

REFERENCES

1. Wilson, Neal. *Soil Water and Ground Water Sampling*, 1995

Benchmark FOPs:

007 Calibration and Maintenance of Portable Dissolved Oxygen Meter
008 Calibration and Maintenance of Portable Field pH/Eh Meter
009 Calibration and Maintenance of Portable Field Turbidity Meter
011 Calibration and Maintenance of Portable Photoionization Detector
012 Calibration and Maintenance of Portable Specific Conductance Meter
022 Groundwater Level Measurement
023 Groundwater Purging Procedures Prior to Sample Collection (optional)
031 Low Flow (Minimal Drawdown) Groundwater Purging & Sampling Procedures (optional)
040 Non-Disposable and Non-Dedicated Sampling Equipment Decontamination
046 Sample Labeling, Storage and Shipment Procedures

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Date:

Location: Project No.: Field Team:

Well No.			Diameter (inches):			Sample Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			Casing Volume:			Purpose: ☐ Development ☐ Sample			
Total Depth (fbTOR):			Purge Volume (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:			Date: (if different from above)						
	S1								
	S2								

SAMPLE

Well No.			Diameter (inches):			Sample Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			Casing Volume:			Purpose: ☐ Development ☐ Sample			
Total Depth (fbTOR):			Purge Volume (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:			Date: (if different from above)						
	S1								
	S2								

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

FIELD OPERATING PROCEDURES

Low-Flow (Minimal Drawdown) Groundwater Purging & Sampling Procedure

FOP 031.2

LOW FLOW (MINIMAL DRAWDOWN) GROUNDWATER PURGING & SAMPLING PROCEDURES

PURPOSE

This procedure describes the methods used for performing low flow (minimal drawdown) purging, also referred to as micro-purging, at a well prior to groundwater sampling to obtain a representative sample from the water-bearing zone. This method of purging is used to minimize the turbidity of the produced water. This may increase the representativeness of the groundwater samples by avoiding the necessity of filtering suspended solids in the field prior to preservation of the sample.

Well purging is typically performed immediately preceding groundwater sampling. The sample should be collected as soon as the parameters measured in the field (i.e., pH, specific conductance, dissolved oxygen, Eh, temperature, and turbidity) have stabilized.

PROCEDURE

Allow approximately 3 to 10 days following well development for groundwater to return to static conditions before performing low-flow purge and sample activities at any well location. Conversely, perform low-flow sampling as soon as purged groundwater has stabilized. If the well does not yield sufficient volume (i.e., cannot maintain a constant water level during purging) for low-flow purge and sampling, then an alternative method must be performed in accordance with Benchmark's Groundwater Purging Procedures Prior to Sample Collection FOP.

1. Water samples should not be taken immediately following well development. Sufficient time should be allowed to stabilize the groundwater flow regime in

the vicinity of the monitoring well. This lag time will depend on site conditions and methods of installation but may exceed one week.

2. Prepare the electronic water level indicator (e-line) in accordance with the procedures referenced in the Benchmark's Groundwater Level Measurement FOP and decontaminate the e-line probe and a lower portion of cable following the procedures referenced in the Benchmark's Non-disposable and Non-dedicated Sampling Equipment Decontamination FOP. Store the e-line in a protected area until use. This may include wrapping the e-line in clean plastic until the time of use.

3. Calibrate all sampling devices and monitoring equipment in accordance with manufacturer's recommendations, the site Quality Assurance Project Plan (QAPP) and/or Field Sampling Plan (FSP). Calibration of field instrumentation should be followed as specified in Benchmark's Calibration and Maintenance FOP for each individual meter.

4. Inspect the well/piezometer for signs of vandalism or damage and record condition on the Groundwater Field Form (sample attached). Specifically, inspect the integrity of the following: concrete surface seal, lock, protective casing and well cover, well casing and J-plug/cap. Report any irregular findings to the Project Manager.

5. Unlock and remove the well protective cap or cover and place on clean plastic to avoid introducing foreign material into the well.

6. Monitor the well for organic vapors using a PID, as per the Work Plan. If a reading of greater than 5 ppm is recorded, the well should be allowed to vent until levels drop below 5 ppm before proceeding with purging.

7. Lower the e-line probe slowly into the monitoring well and record the initial water level in accordance with the procedures referenced in Benchmark's Groundwater Level Measurement FOP. Refer to the construction diagram for the well to identify the screened depth.

8. Decontaminate all non-dedicated pump and tubing equipment following the procedures referenced in the Benchmark's Non-disposable and Non-dedicated Sampling Equipment Decontamination FOP.

9. Lower the purge pump or tubing (i.e., low-flow electrical submersible, peristaltic, etc.) slowly into the well until the pump/tubing intake is approximately in the middle of the screened interval. Rapid insertion of the pump will increase the turbidity of well water, and can increase the required purge time. This step can be eliminated if dedicated tubing is already within the well.

   Placement of the pump close to the bottom of the well will cause increased entrainment of solids, which may have settled in the well over time. Low-flow purging has the advantage of minimizing mixing between the overlying stagnant casing water and water within the screened interval. The objective of low-flow purging is to maintain a purging rate, which minimizes stress (drawdown) of the water level in the well. Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen.

10. Lower the e-line back down the well as water levels will be frequently monitored during purge and sample activities.

11. Begin pumping to purge the well. The pumping rate should be between 100 and 500 milliliters (ml) per minute (0.03 to 0.13 gallons per minute) depending on site hydrogeology. Periodically check the well water level with the e-line adjusting the flow rate as necessary to stabilize drawdown within the well. If possible, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 feet or less). If the water level exceeds 2 feet below static and declining, slow the purge rate until the water level generally stabilizes. Record each pumping rate and water level during the event. If the water level continues to drop and will not stabilize, the monitoring location is not conducive to low-flow sampling and conventional purge and sample methods should be performed.

The low flow rate determined during purging will be maintained during the collection of analytical samples. At some sites where geologic heterogeneities are sufficiently different within the screened interval, high conductivity zones may be preferentially sampled.

12. Measure and record field parameters (pH, specific conductance, Eh, dissolved oxygen (DO), temperature, and turbidity) during purging activities. In lieu of measuring all of the parameters, a minimum subset could be limited to pH, specific conductance, and turbidity or DO. A reduction in the field parameter list must be approved by the Project Manager and/or the NYSDEC Project Manager.

    Water quality indicator parameters should be used to determine purging needs prior to sample collection in each well. Stabilization of indicator parameters should be used to determine when formation water is first encountered during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by Eh, DO and turbidity. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. An in-line flow through cell to continuously measure the above parameters may be used. The in-line device should be disconnected or bypassed during sample collection.

13. Purging will continue until parameters of water quality have stabilized. Record measurements for field indicator parameters (including water levels) at regular intervals during purging. The stability of these parameters with time can be used to guide the decision to discontinue purging. Proper adjustments must be made to stabilize the flow rate as soon as possible.

14. Record well purging and sampling data in the Project Field Book or on the Groundwater Field Form (sample attached). Measurements should be taken approximately every three to five minutes, or as merited given the rapidity of change.

15. Purging is complete when field indicator parameters stabilize. Stabilization is achieved after all field parameters have stabilized for three successive readings. Three successive readings should be within ± 0.1 units for pH, ± 3% for specific conductance, ± 10 mV for Eh, and ± 10% for turbidity and dissolved oxygen. These stabilization guidelines are provided for rough estimates only, actual site-specific knowledge may be used to adjust these requirements higher or lower.

    An in-line water quality measurement device (e.g., flow-through cell) should be used to establish the stabilization time for several field parameters on a well-specific basis. Data on pumping rate, drawdown, and volume required for parameter stabilization can be used as a guide for conducting subsequent sampling activities.

16. Collect all project-required samples from the discharge tubing at the flow rate established during purging in accordance with Benchmark's Groundwater Sample Collection Procedures FOP. **A peristaltic pump and dedicated tubing cannot be used to collect VOC or SVOC project-required samples; only non-organic compounds may be collected using this type of pump.** Continue to maintain a constant flow rate such that the water level is not drawn down as described above. Fill sample containers with minimal turbulence by allowing the ground water to flow from the tubing along the inside walls of the container.

17. If field filtration is recommended as a result of increased turbidity greater than 50 NTU, an in-line filter equipped with a 0.45-micron filter should be utilized. Collection of a filtered sample must be accompanied by an unfiltered sample.

18. Replace the dedicated tubing down the well taking care to avoid contact with the ground surface.

19. Restore the well to its capped/covered and locked condition.

20. Upon purge and sample collection completion, slowly lower the e-line to the bottom of the well/piezometer. Record the total depth to the nearest 0.01-

foot and compare to the previous total depth measurement. If a significant discrepancy exists, re-measure the total depth. Record observations of purge water to determine whether the well/piezometer had become silted due to inactivity or damaged (i.e., well sand within purge water). Upon confirmation of the new total depth and determination of the cause (i.e., siltation or damage), notify the Project Manager following project field activities.

ATTACHMENTS

Groundwater Field Form (sample)

REFERENCES

United States Environmental Protection Agency, 540/S-95/504, 1995. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures.*

Benchmark FOPs:

007 *Calibration and Maintenance of Portable Dissolved Oxygen Meter*
008 *Calibration and Maintenance of Portable Field pH/Eh Meter*
009 *Calibration and Maintenance of Portable Field Turbidity Meter*
011 *Calibration and Maintenance of Portable Photoionization Detector*
012 *Calibration and Maintenance of Portable Specific Conductance Meter*
022 *Groundwater Level Measurement*
024 *Groundwater Sample Collection Procedures*
040 *Non-Disposable and Non-Dedicated Sampling Equipment Decontamination*
046 *Sample Labeling, Storage and Shipment Procedures*

LOW FLOW (MINIMAL DRAWDOWN) GROUNDWATER PURGING & SAMPLING PROCEDURES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Date:

Location: Project No.: Field Team:

Well No.			Diameter (inches):			Sample Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			Casing Volume:			Purpose: ☐ Development ☐ Sample			
Total Depth (fbTOR):			Purge Volume (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:			Date: (if different from above)						
	S1								
	S2								

Well No.			Diameter (inches):			Sample Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			Casing Volume:			Purpose: ☐ Development ☐ Sample			
Total Depth (fbTOR):			Purge Volume (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:			Date: (if different from above)						
	S1								
	S2								

SAMPLE

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

APPENDIX F

GROUNDWATER MONITORING WELL SAMPLING AND INSPECTION FORMS

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER FIELD FORM

Project Name: Date:

Location: Project No.: Field Team:

Well No.			Diameter (inches):			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			One Well Volume (gal):			Purpose: ☐ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR):			Total Volume Purged (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

Well No.			Diameter (inches):			Sample Date / Time:			
Product Depth (fbTOR):			Water Column (ft):			DTW when sampled:			
DTW (static) (fbTOR):			One Well Volume (gal):			Purpose: ☐ Development ☐ Sample ☐ Purge & Sample			
Total Depth (fbTOR):			Total Volume Purged (gal):			Purge Method:			
Time	Water Level (fbTOR)	Acc. Volume (gallons)	pH (units)	Temp. (deg. C)	SC (uS)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Appearance & Odor
	0 Initial								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
Sample Information:									
	S1								
	S2								

REMARKS:

Note: All water level measurements are in feet, distance from top of riser.

Volume Calculation

Diam.	Vol. (g/ft)
1"	0.041
2"	0.163
4"	0.653
6"	1.469

Stabilization Criteria

Parameter	Criteria
pH	± 0.1 unit
SC	± 3%
Turbidity	± 10%
DO	± 0.3 mg/L
ORP	± 10 mV

PREPARED BY:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

GROUNDWATER WELL INSPECTION FORM

Project:	**WELL I.D.:**
Client:	
Job No.:	
Date:	
Time:	

EXTERIOR INSPECTION

Protective Casing:
Lock:
Hinge/Lid:
Concrete Surface Seal:
Bollards:
Label/I.D.:
Other:

INTERIOR INSPECTION

Well Riser:
Annular Space:
Well Cap:
Water Level (fbTOR):
Total Depth (fbTOR):
Other:

Comments/Corrective Actions:

PREPARED BY: DATE:

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

WATER LEVEL MONITORING RECORD

Project Name: Client:
Project No.: Location:
Field Personnel: Date:
Weather:

Well No.	Time	Top of Riser Elevation (fmsl)	Static Depth to Water (fbTOR)	Groundwater Elevation (fmsl)	Total Depth (fbTOR)	Last Total Depth Measurement (fbTOR)

Comments/Remarks:

PREPARED BY: DATE:

APPENDIX G

MONITORING AND INSPECTION FORMS

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

Active Sub-Slab Depressurization System
Monthly Operation & Maintenance Log

Project Name:	Project No.:
Project Location:	Client:
Preparer's Name:	Date/Time:

Notes:

Monthly Operating Status:

System(s) currently running? ☐ yes ☐ no

Has the system been off-line in the past month? ☐ yes ☐ no

If yes, please list the dates and brief description why (i.e. maintenance, part replacement, etc.):

What is the current Vacuum reading? ☐

Visual Inspection:

Any piping disconnected?	☐ yes	☐ no
Any cracks visible in piping?	☐ yes	☐ no
Any new cracks visible in slab floor?	☐ yes	☐ no
Magnehelic guage reading 0?	☐ yes	☐ no

If yes to any question above, please provide more information below.

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

Active Sub-Slab Depressurization System
Monthly Operation & Maintenance Log

Change in Occupancy / Use of Space:

Please indicate general use of floor space? _____ _____ _____

Has this general use changed in the past month? ☐ yes ☐ no

If yes, please explain:

System Modifications:

Have any modifications been made to the Sub-Slab Depressurization System? ☐ yes ☐ no

If so, please list with date:

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

Active Sub-Slab Depressurization System Annual Operation & Maintenance Certification Checklist

Project Name:	Project No.:
Project Location:	Client:
Preparer's Name:	Date/Time:

Notes:

System Information

Has monthly system inspection been completed regularly?	☐ yes	☐ no
Are last 11 inspection logs attached for the past 12 months?	☐ yes	☐ no

What is the current Vacuum reading? ☐

System Updates, Maintenance, Part Replacement

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

Active Sub-Slab Depressurization System Annual Operation & Maintenance Certification Checklist

Change in Occupancy / Use of Space:

Please indicate general use of floor space? _____ _____ _____

Has this general use changed in the past year? ☐ yes ☐ no

If yes, please explain:

Building Renovations:

Have any building renovations taken place in the last month? ☐ yes ☐ no

If yes, please provide more information below, and sketch any basement floor plan modifications on the floor plan sketch below.

System Modifications:

Have any modifications been made to the Sub-Slab Depressurization System? ☐ yes ☐ no

If so, please list with date:

Active Sub-Slab Depressurization System
Annual Operation & Maintenance
Certification Checklist

Floor Plan Sketch:

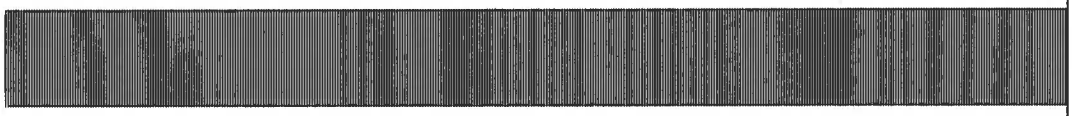
Draw a plan view sketch of the basement of the building. Indicate Sub-Slab Depressurization system location. Please also note and include, any alterations to the system, locations of visible cracks and/or repairs needed, and changes or alterations to the usage of this space.

APPENDIX H

ENGINEERING CONTROLS
ASD SYSTEM AS-BUILT DRAWINGS AND MANUAL

New York State Department of Environmental Conservation
Immediate Investigation Summary Report

SSD System



0266-377 / BUF

MALCOLM PIRNIE

mitigation tech *vapor intrusion specialists*

INVOICE

January 26, 2009

Mr. James J. Richert
Senior Project Hydrogeologist
Malcolm Pirnie, Inc.
50 Fountain Plaza, Suite 600
Buffalo, New York 14202
Via e-mail: jrichert@pirnie.com

Re: Project # 0266377
267 Franklin St., Buffalo, NY
Sub-slab Depressurization

For work completed 12-1, 2008 per proposals dated 9-11, 2008 and 10-13, 2008

Phase 1 - Furnished:

- Sub-slab air communication testing
- Professional design analysis to optimize fan and piping configuration and to minimize disturbance to existing or planned interior improvements and operation
- Examine the floor surfaces for material defects and potential leaks that would diminish the effectiveness of the SSD system
- Prepare and submit a work plan in accordance with NYS DOH Guidance Document on Mitigation of Soil Vapor Intrusion

Phase 2 - Furnished and Installed:

- Professional field consultation and supervision
- Sub-slab air communication testing concurrent with construction
- Design/Build construction for optimized outcome based on continuing field measurement
- Final placements of all components subject to approval by representatives of Malcolm Pirnie
- [System 1] -- (1) RADONAWAY GP-501 series centrifugal in-line fan (max 4.2 wci), (150w maximum continuous duty), roof mount via abandoned chimney, to provide sub-slab

depressurization via 4" or 3" schedule 40 PVC pipe to roof exhaust; with (3) suction cavities in sub-slab, with urethane seal; boiler room and south basement apartment; access hole to suction cavity by 5"core drill; suction cavity to consist of approximately 1 cu. ft. excavated material in sub-slab

- [System 2] -- (2) RADONAWAY RP-265 series centrifugal in-line fan (in series, each max 2.6 wci), (150w maximum continuous duty), roof mount via abandoned chimney, to provide sub-slab depressurization via 4" vertical riser/truck line and (4) 3"" connecting lines to sub-slab at strategic locations
- (2) U-tube manometers, one per system
- Electrical weatherproof conduit from fan housings to building interior and connection to customer designated circuit in boiler room
- Urethane sealant at slab joints, cracks and penetrations
- At completion, smoke test all floor cavities for vacuum leaks; backdraft test
- At completion, measure pressure differentials and document per Malcolm Pirnie requirements
- Insurance certificates as required
- Three year warranty; labor and installed components; although system design is based on achieving a sufficient pressure differential as suggested by site assessment, no specific warranty of effectiveness – effectiveness shall be determined by continuing field measurement provided by others; additional or modified suction points, fans or other measures may be required by others at other's expense

Labor and material: Phase 1 [redacted]
Phase 2
Net.....

Thank you.

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722

MALCOLM PIRNIE

INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS AND CONSULTANTS

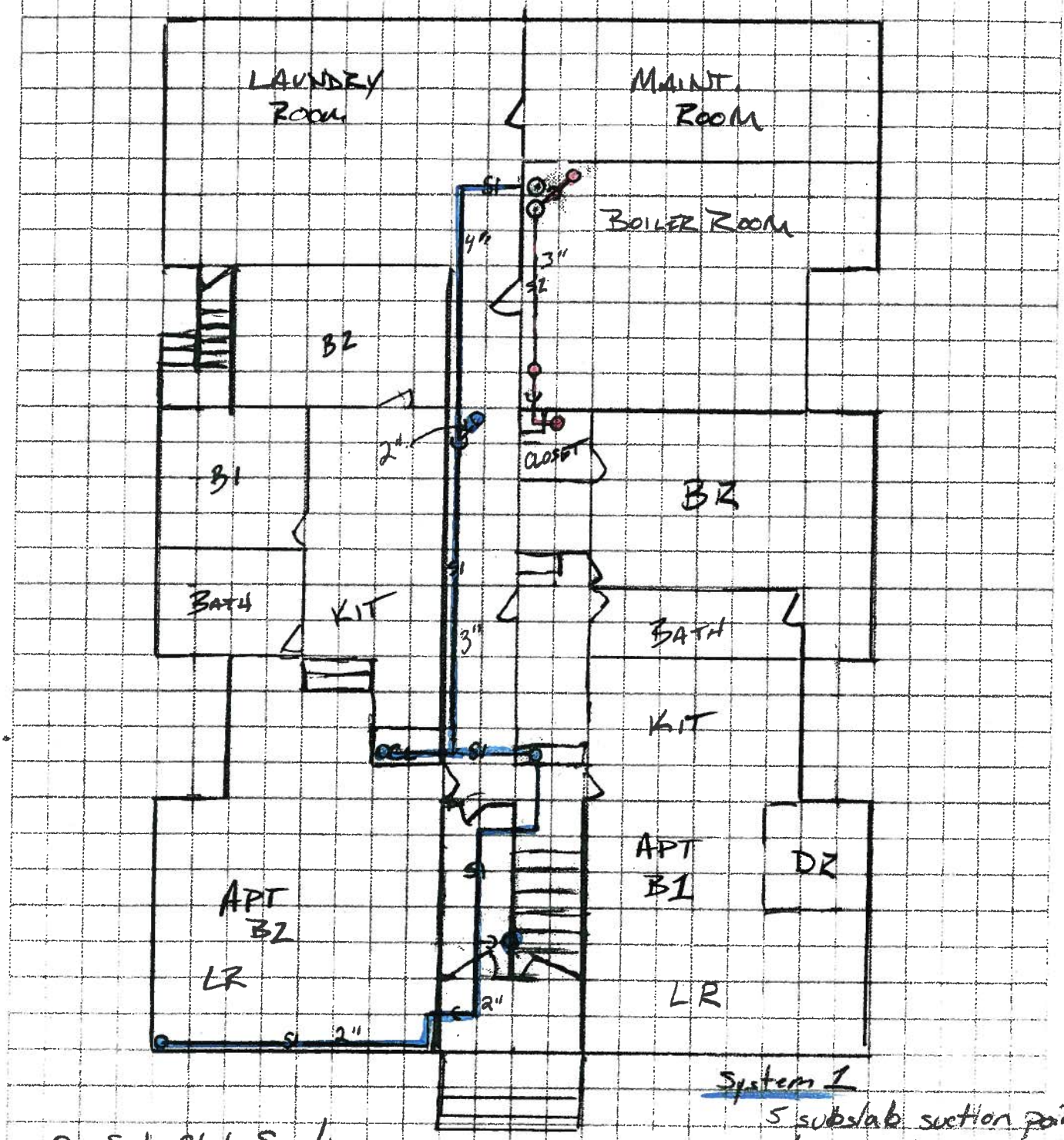
Malcolm Pirnie, Inc.

BY BWJ DATE 12/5/08 SHEET NO. ..... OF .....

CHKD. BY ..... DATE ..... JOB NO. .....

SUBJECT 267 FRANKLIN ST

Sub-Slab System Configuration



System 1
5 subslab suction points w/ 2 265 Fans (stacked)

System 2
3 subslab suction points w/ 1 501 Fan

O - Sub-Slab Suction Point

FRANKLIN ST

146721

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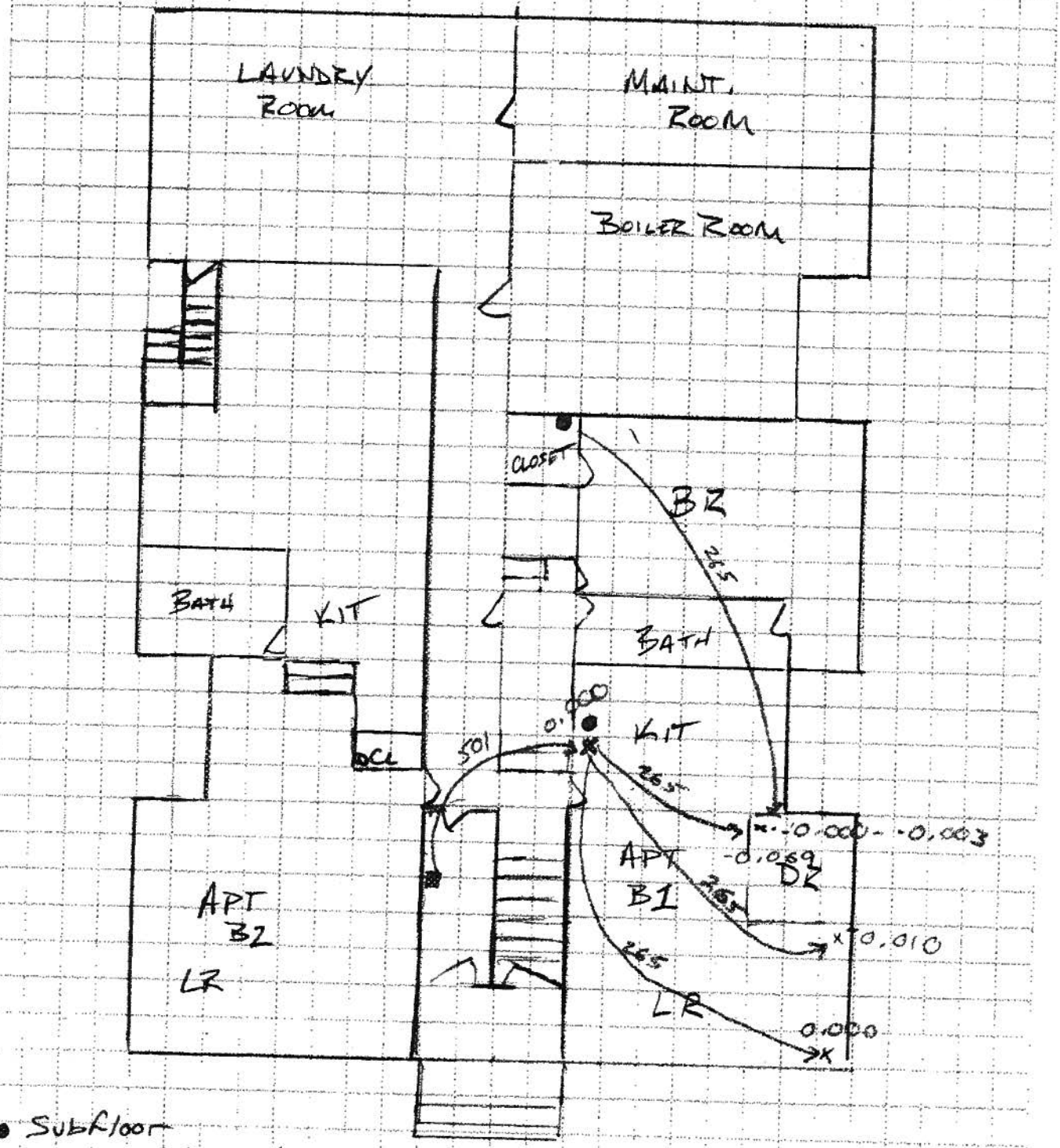
INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS AND CONSULTANTS

Malcolm Pirnie, Inc.

BY BWJ DATE 11/13/08 SHEET NO. 1 OF

CHKD. BY DATE JOB NO.

SUBJECT 267 FRANKLIN ST



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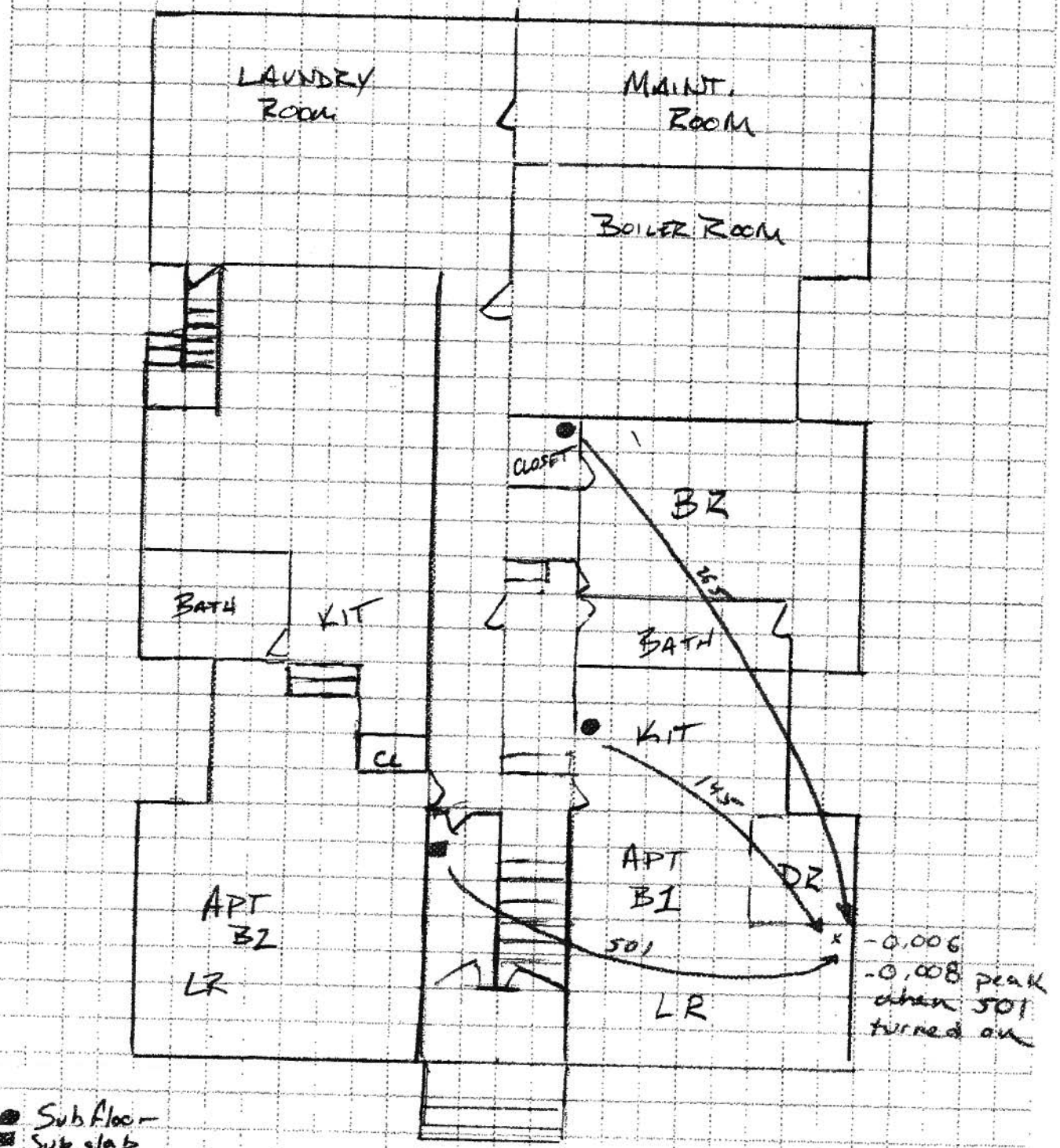
Malcolm Pirnie, Inc.

BY BW DATE 11/13/08 SHEET NO. 2 OF

CHKD. BY ..... DATE ..... JOB NO. .....

SUBJECT 267 FRANKLIN ST



FRANKLIN ST

1467721

Solutions for Life™

MALCOLM PIRNIE

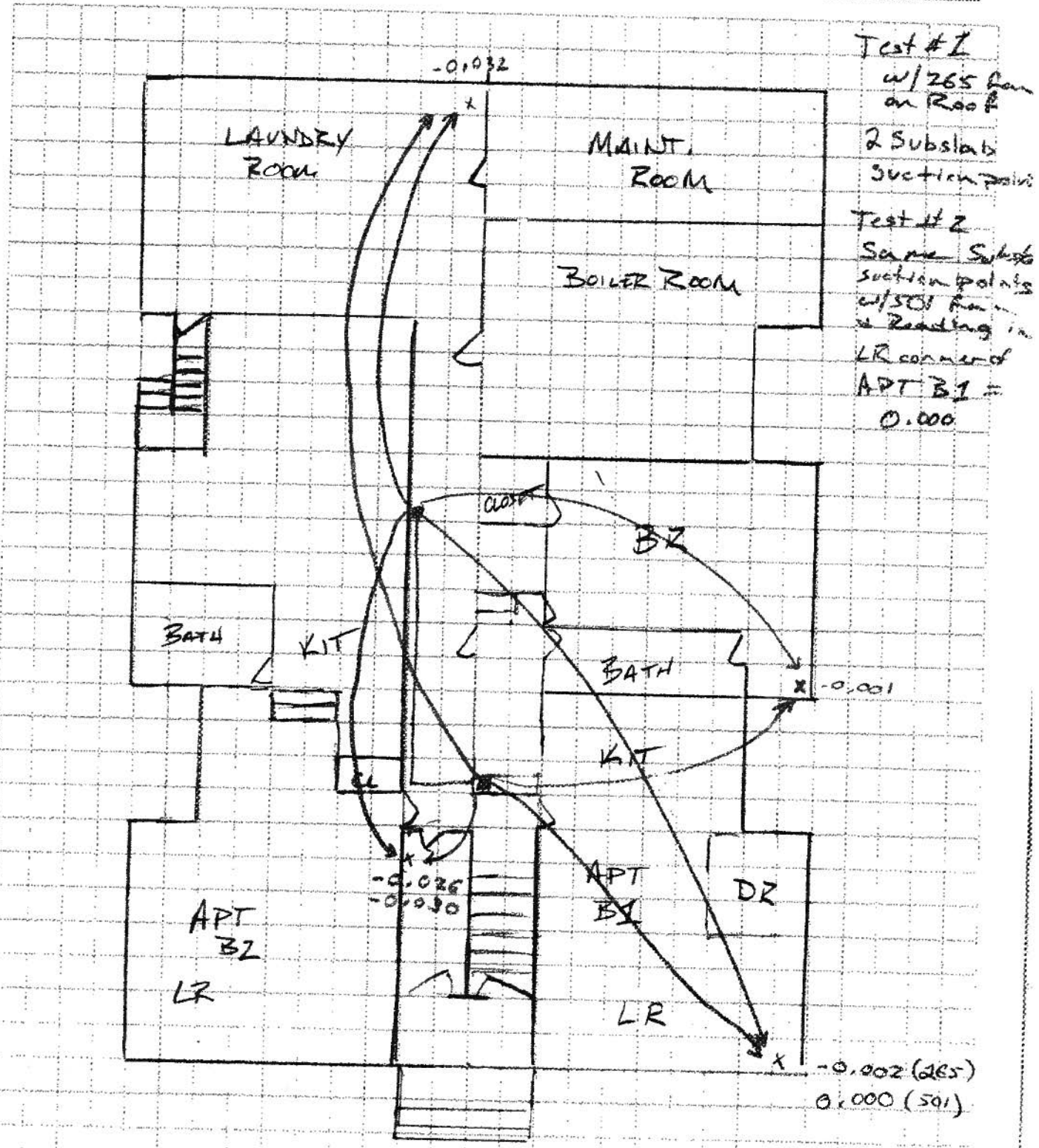
INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS AND CONSULTANTS

Malcolm Pirnie, Inc.

BY BWJ DATE 11/14/08 SHEET NO. 3 OF .....

CHKD. BY ..... DATE ..... JOB NO. .....

SUBJECT 267 FRANKLIN ST



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INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS AND CONSULTANTS

Malcolm Pirnie, Inc. 14

BY BWJ DATE 11/25/08 SHEET NO. 4 OF

CHKD. BY DATE JOB NO.

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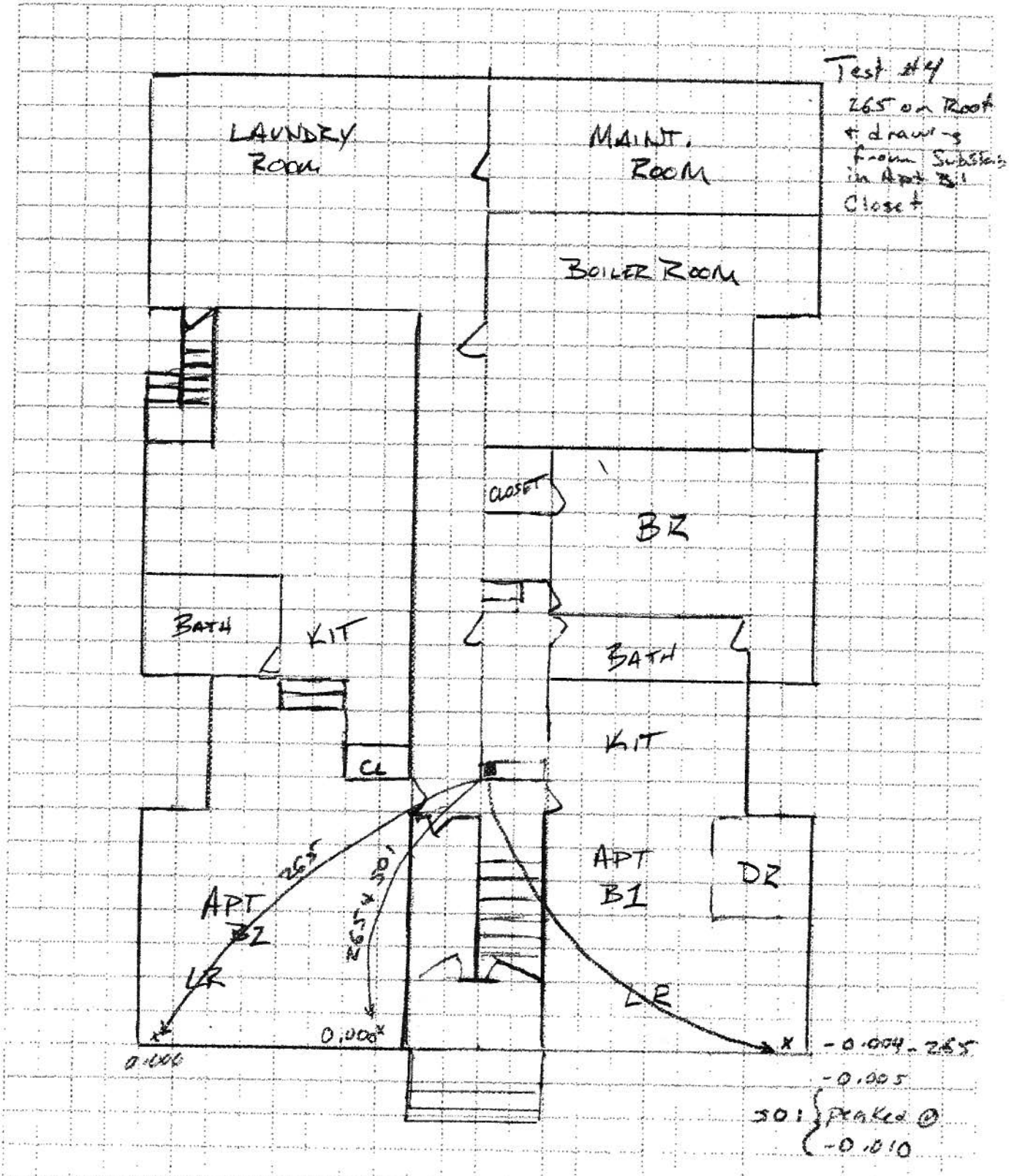

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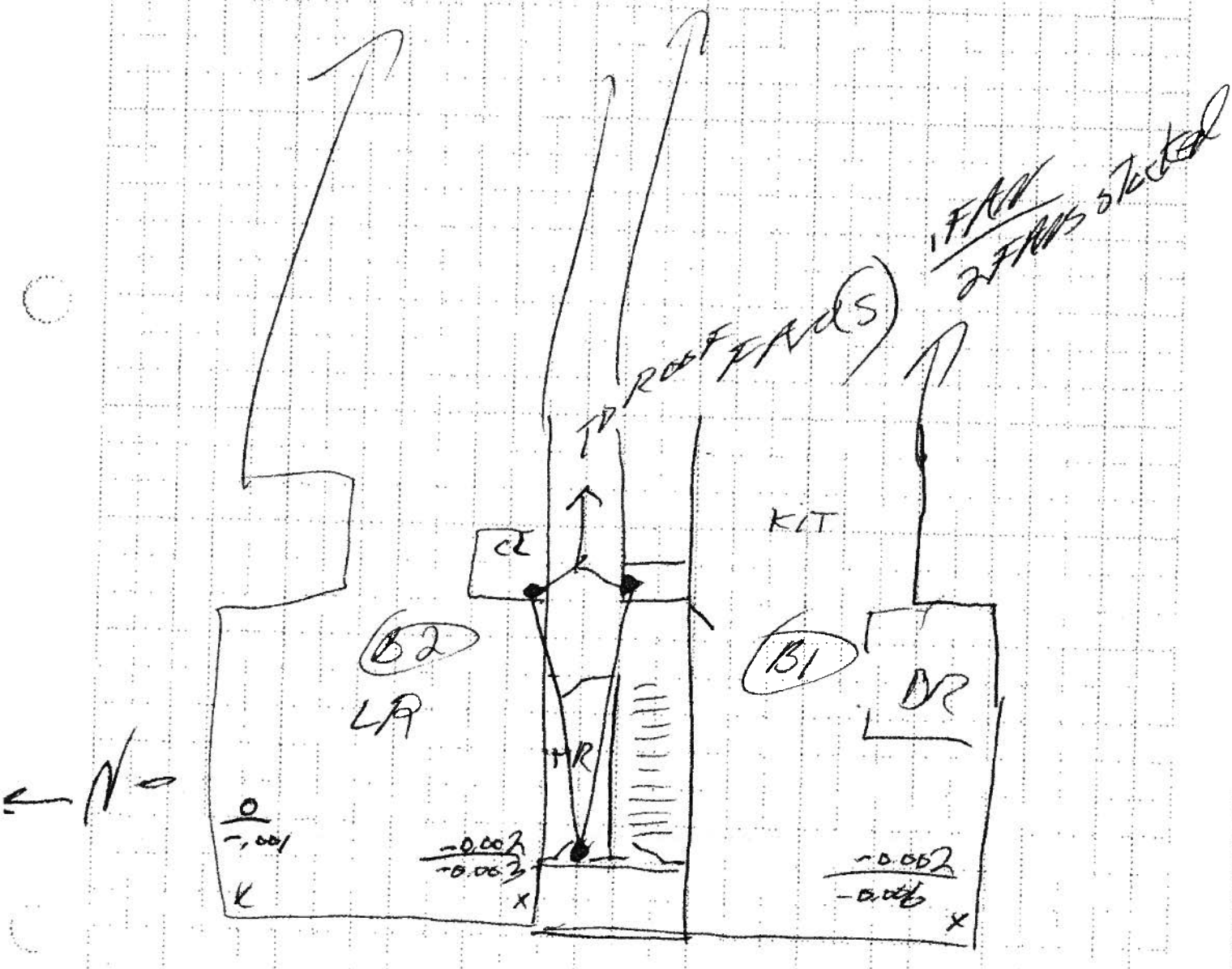
INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS AND CONSULTANTS

Malcolm Pirnie, Inc.

BY JE DATE 11/04 SHEET NO. 1 OF

CHKD. BY DATE JOB NO.

SUBJECT 267 Franklin St



267 Franklin St

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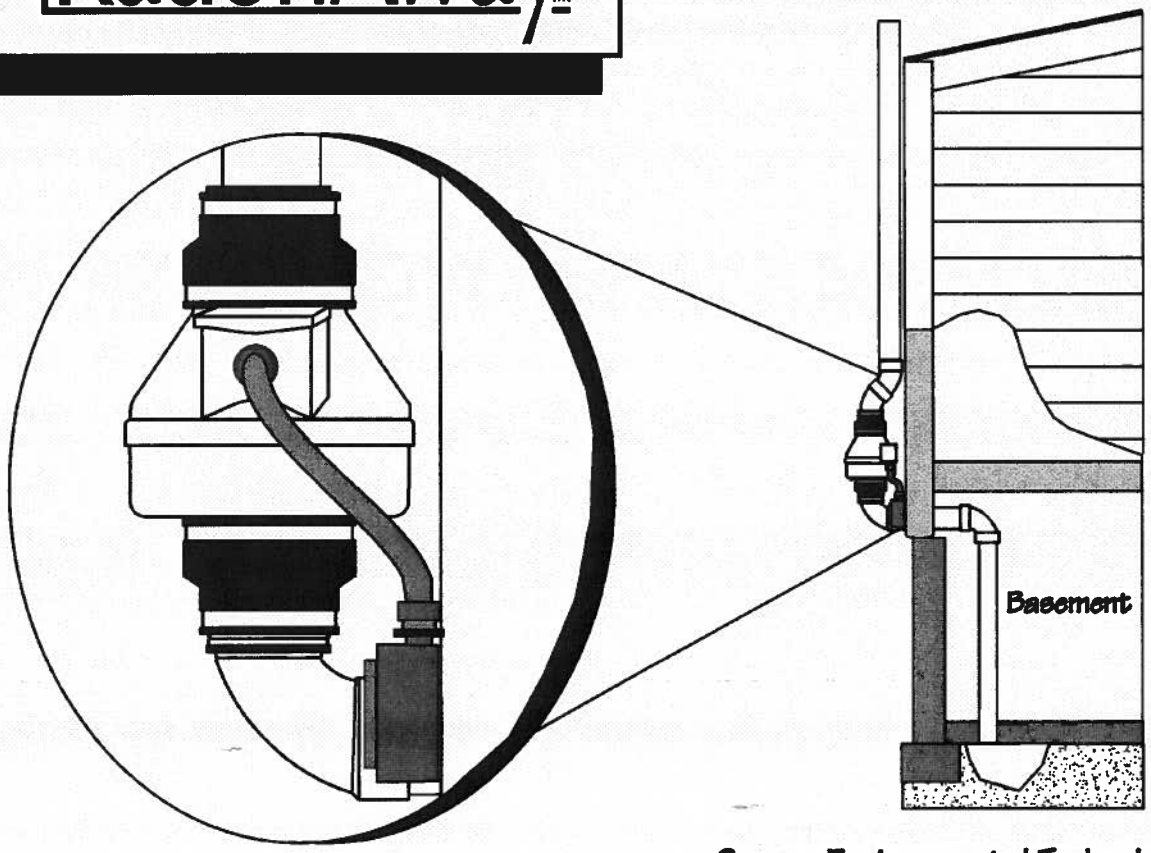
Solutions for Life™

RP Series Installation Instructions

By RadonAway™



Spruce Environmental Technologies, Inc.
Ward Hill, MA P/N IN020 Rev H

RadonAway™

Series Fan Installation Instructions

Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED.
MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION.
DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.

2. **WARNING!** Do not use fan to pump explosive or corrosive gases.

3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

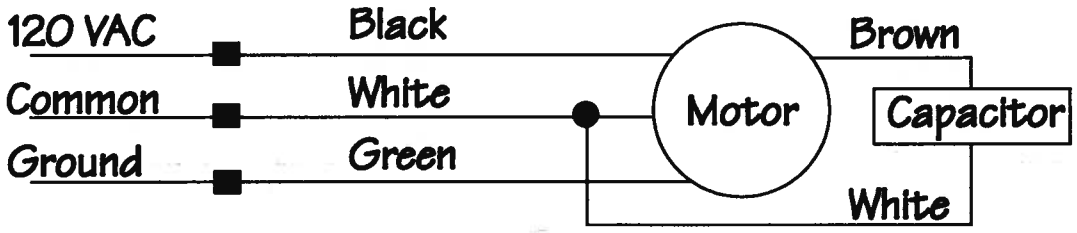
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
Do NOT attempt to open. Return unit to the factory for service.

6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician

7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

DynaVac RP Series Fan Wiring Diagram



1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The DynaVac RP Series Radon Fans are intended for use by trained, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a DynaVac Fan. This instruction should be considered as a supplement to EPA standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The RP Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

1.3 ACOUSTICS

The RP Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the RP Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

1.5 SLAB COVERAGE

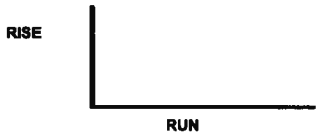
The RP Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/145/155 are best suited for general purpose use. The RP260 can be used where additional airflow is required and the RP265/380 is best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.6 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP Series Fans are **NOT** suitable for underground burial.

For RP Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

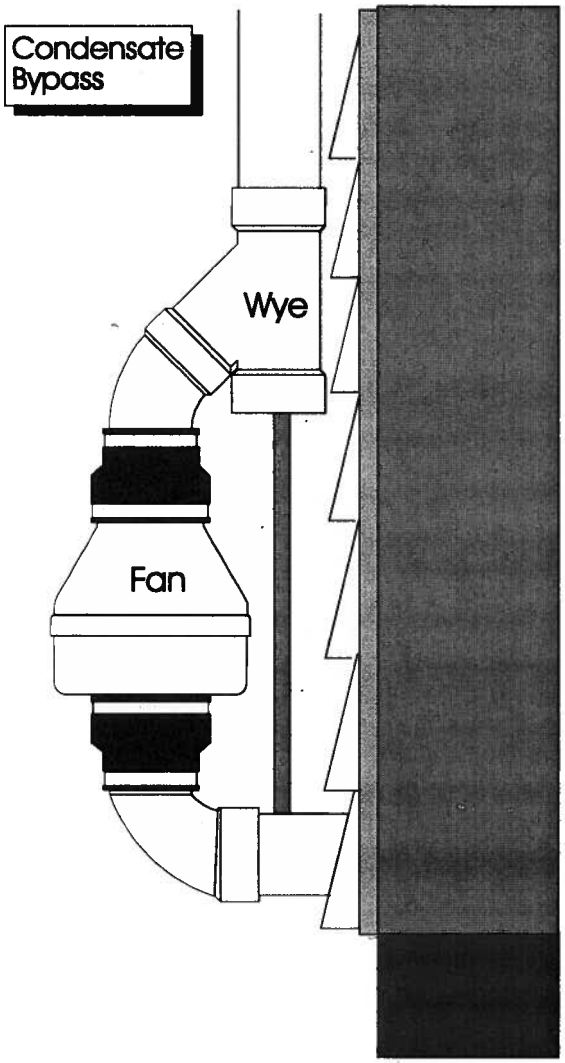
Pipe Dia.	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6"	-	3/16	1/4	3/8	3/4
4"	1/8	1/4	3/8	2 3/8	-
3"	1/4	3/8	1 1/2	-	-



*Typical RP1xx/2xx Series Fan operational flow rate is 25 - 90 CFM 0n 3" and 4" pipe. (For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.

The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.



1.7 "SYSTEM ON" INDICATOR

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A manometer, such as a U-Tube, or a vacuum alarm is recommended for this purpose.

1.8 ELECTRICAL WIRING

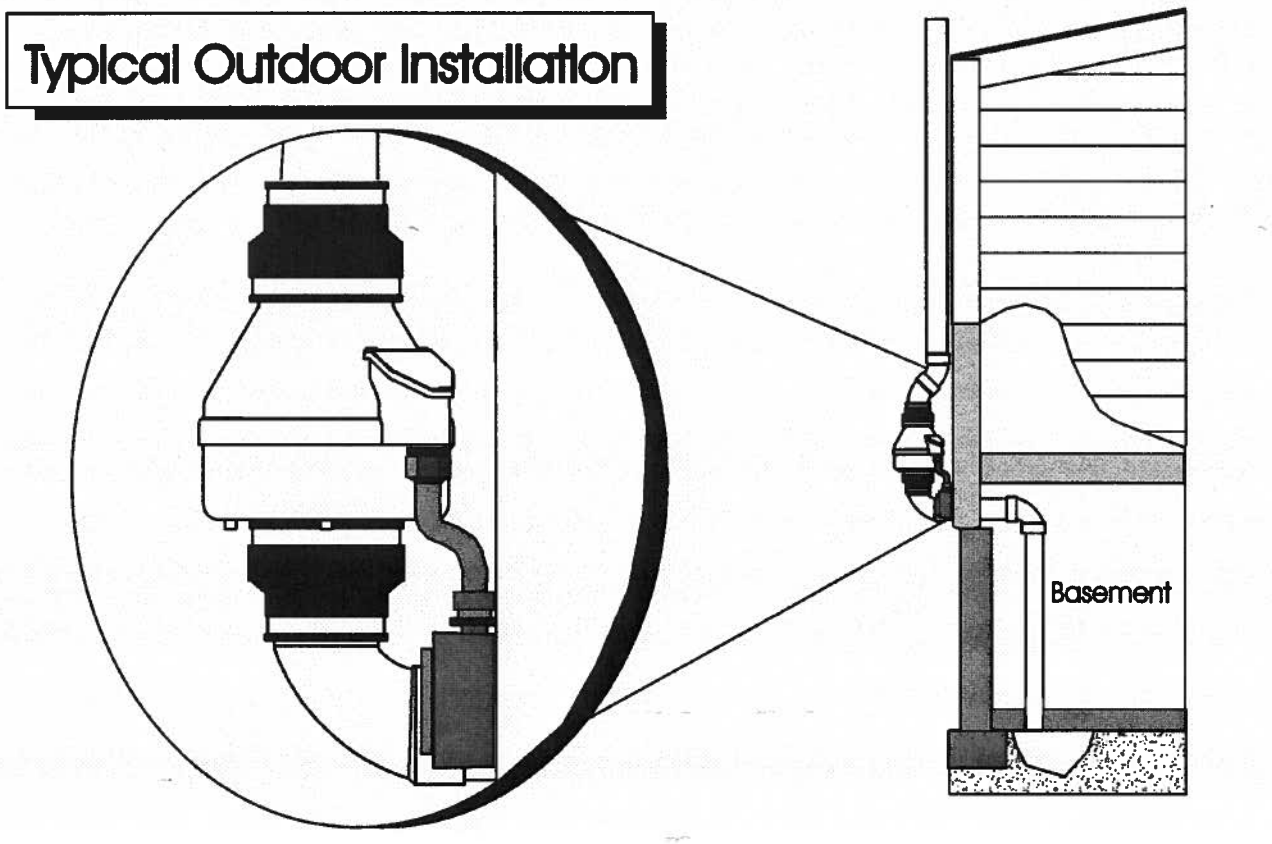
The RP Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly caulked to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The RP Series Fans are rated for use with electronic speed controls ,however , they are generally not recommended.

2.0 INSTALLATION

The RP Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The RP Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the RP Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)

The RP Series fan may be optionally secured with the RadonAway P/N 25007-2 (25033 for RP385) mounting bracket. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

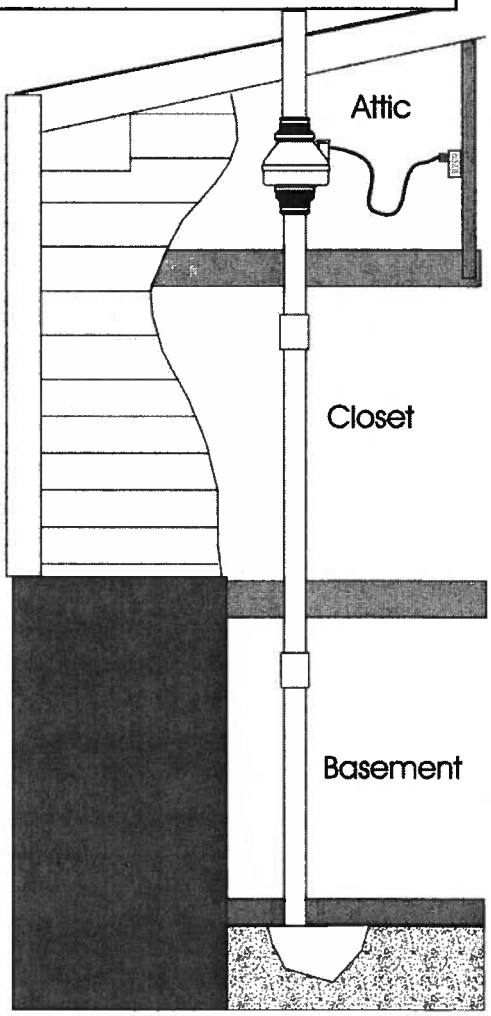
Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections:

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

Typical Indoor Installation



2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS

_____ **Verify** all connections are tight and **leak-free**.

_____ **Insure** the RP Series Fan and all ducting is secure and vibration-free.

_____ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is **less than** maximum recommended operating pressure

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)

(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)

See Product Specifications. If this is exceeded, increase the number of suction points.

_____ **Verify Radon levels by testing to EPA protocol.**

RP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the RP Series Fan:

Typical CFM Vs Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140	134	101	68	10	-	-	-	-	-
RP145	173	152	132	115	94	73	55	37	-
RP155	185	161	137	115	94	73	55	37	-
RP260	275	225	180	140	105	70	20	-	-
RP265	327	302	260	230	207	176	139	101	57
RP380*	420	375	330	260	220	170	130	70	30

* Tested with 6" inlet and discharge pipe.

Power Consumption 120 VAC, 60Hz 1.5 Amp Maximum		Maximum Recommended Operating Pressure* (Sea Level Operation)**	
RP140	14 - 20 watts	RP140	0.8" W.C.
RP145	37 - 71 watts	RP145	1.7" W.C.
RP155	37 - 75 watts	RP155	1.7" W.C.
RP260	52 - 72 watts	RP260	1.5" W.C.
RP265	86 - 140 watts	RP265	2.2" W.C.
RP380	95 - 152 watts	RP380	2.0" W.C.

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

	Size	Weight	Inlet/Outlet
RP140	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)
RP145	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)
RP155	8.5H" x 9.7" Dia.	5.5 lbs.	5.0" OD
RP260	8.6H" x 11.75" Dia.	5.5 lbs.	6.0" OD
RP265	8.6H" x 11.75" Dia.	6.5 lbs.	6.0" OD
RP380	10.53H" x 13.41" Dia.	11.5 lbs.	8.0" OD

Recommended ducting: 3" or 4" RP1xx/2xx, 6" RP380, Schedule 20/40 PVC Pipe

Mounting: Mount on the duct pipe or with optional mounting bracket.

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class B Insulation

Thermally protected

3000 RPM

Rated for Indoor or Outdoor Use

LISTED Electric Fan ETL® Tested to UL Std. 507

77728

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GP/XP/XR/RP Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the GP/XP/XR/RP Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPX01/XP/XR/RP Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE GPx01/XP/XR/RP SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No._____
Purchase Date_____

RadonAway Ward Hill, MA IN014 Rev F

XP/GP/XR Series Fan Installation Instructions

Please Read And Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible of flammable materials.

2. **WARNING!** Do not use fan to pump explosive or corrosive gases.

3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

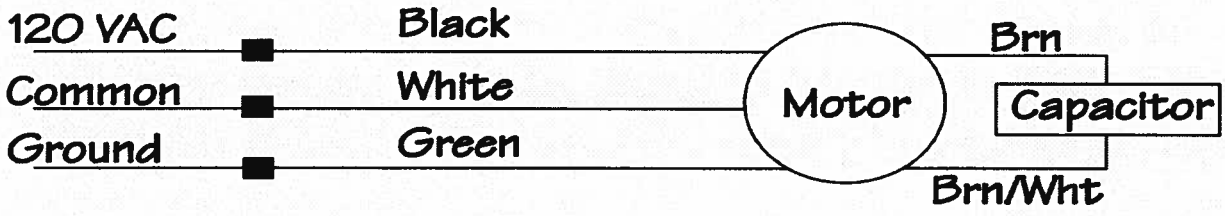
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

5. **NOTICE!** There are no user serviceable parts located inside the fan unit. **Do NOT attempt to open.** Return unit to the factory for service.

6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.

7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

DynaVac GP/XP/XR/RP Series Fan Wiring Diagram



RadonAway™

INSTALLATION INSTRUCTION IN014 Rev F

DynaVac - XP/XR Series		DynaVac - GP Series	
XP101	p/n 23008-1,-2	GP201	p/n 23007-1
XP151	p/n 23010-1,-2	GP301	p/n 23006-1,-2
XP201	p/n 23011-1,-2	GP401	p/n 23009-1
XR161	p/n 23018-1,-2	GP501	p/n 23005-1,-2
XR261	p/n 23019-1,-2		

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The DynaVac GP/XP/XR Series Radon Fans are intended for use by trained, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a DynaVac Fan. This instruction should be considered as a supplement to EPA standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The GP/XP/XR Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

1.3 ACOUSTICS

The GP/XP/XR Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the GP/XP/XR Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

1.5 SLAB COVERAGE

The GP/XP/XR Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the GP/XP/XR Series Fan best suited for the sub-slab material can improve the slab coverage. The GP & XP series have a wide range of models to choose from to cover a wide range of subslab material. The higher static suction fans are generally used for tighter subslab materials. The XR Series is specifically designed for high flow applications such as stone/gravel and drain tile. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.6 CONDENSATION & DRAINAGE

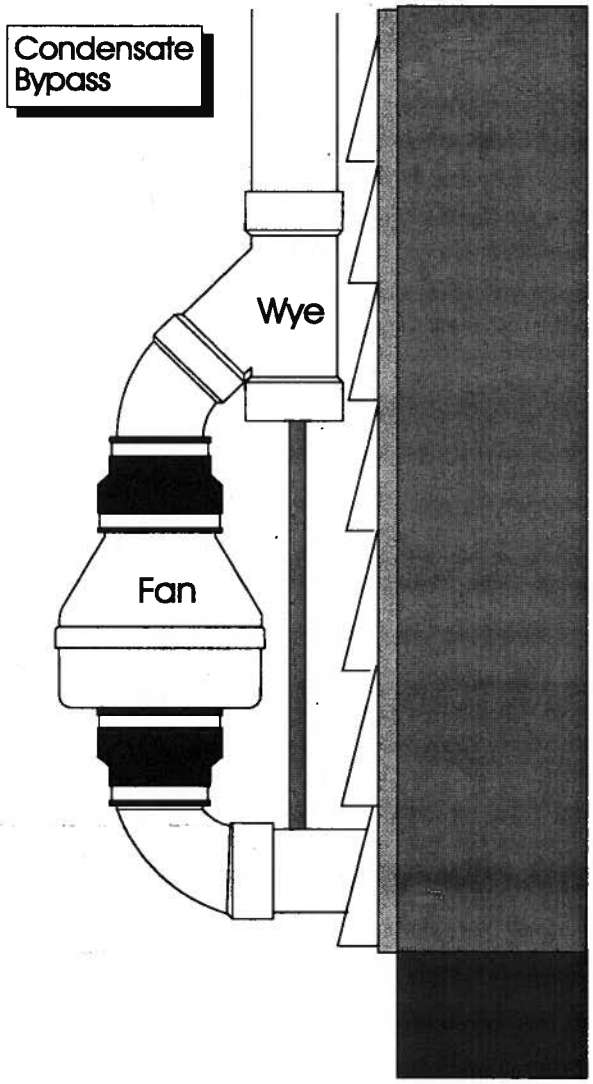
Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The GP/XP/XR Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GP/XP/XR Series Fans are **NOT** suitable for underground burial.

For GP/XP/XR Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Dia.	Minimum Rise per Foot of Run* @25 CFM	@50 CFM	@100 CFM
4"	1/8"	1/4"	3/8"
3"	1/4"	3/8"	1 1/2"

*Typical GP/XP/XR Series Fan operational flow rate is 25 - 90 CFM. (For more precision, determine flow rate by using the chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.



The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

1.7 "SYSTEM ON" INDICATOR

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A manometer, such as a U-Tube, or a vacuum alarm is recommended for this purpose.

1.8 ELECTRICAL WIRING

The GP/XP/XR Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection

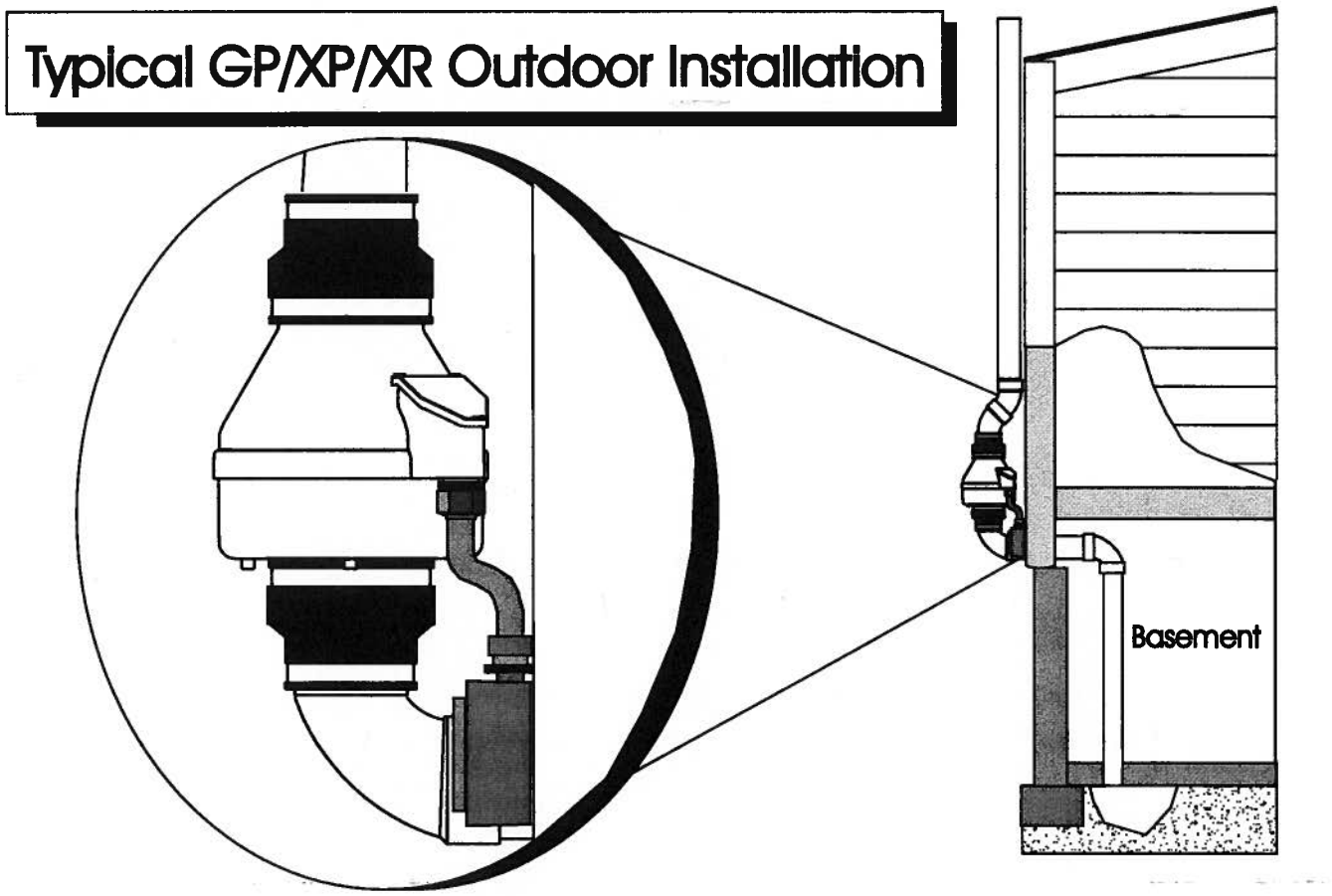
Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit.

1.9 SPEED CONTROLS

The GP/XP/XR Series Fans are rated for use with electronic speed controls ,however, they are generally not recommended.

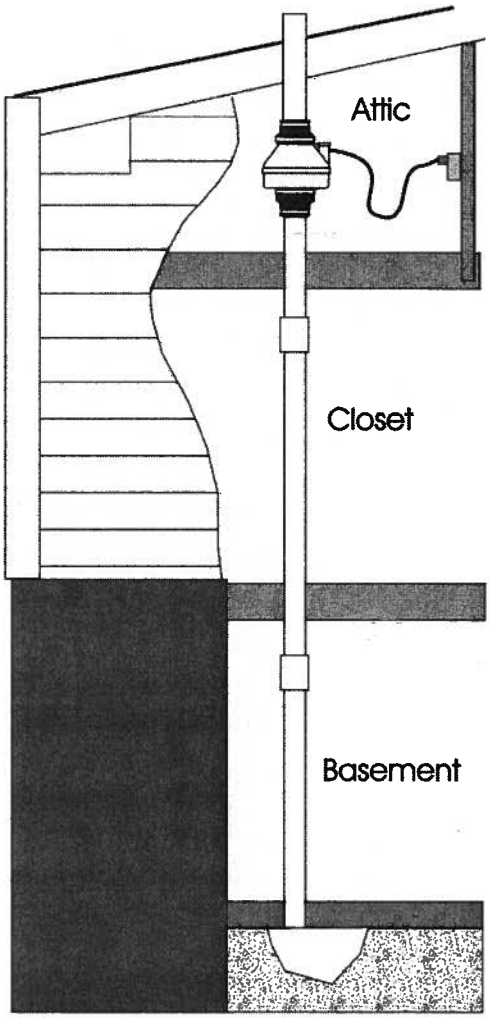
2.0 INSTALLATION

The GP/XP/XR Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The GP/XP/XR Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the GP/XP/XR Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.



2.2 MOUNTING BRACKET (optional)

The GP/XP/XR Series fan may be optionally secured with the integral mounting bracket on the GP Series fan or with RadonAway P/N 25007-2 mounting bracket for an XP/XR Series fan. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections:

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS

_____ **Verify** all connections are tight and **leak-free**.

_____ **Insure** the GP/XP/XR Series Fan and all ducting is secure and vibration-free.

_____ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is **less than** maximum recommended operating pressure

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)

(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)

See Product Specifications. If this is exceeded, increase the number of suction points.

_____ **Verify Radon levels by testing to EPA protocol.**

XP/XR SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the XP & XR Series Fan:

Typical CFM Vs Static Suction "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
XP101	125	118	90	56	5	-	-	-	-
XP151	180	162	140	117	78	46	10	-	-
XP201	150	130	110	93	74	57	38	20	-
XR161	215	175	145	105	75	45	15	-	-
XR261	250	215	185	150	115	80	50	20	-

Maximum Recommended Operating Pressure*		
XP101	0.9" W.C.	(Sea Level Operation)**
XP151	1.3" W.C.	(Sea Level Operation)**
XP201	1.7" W.C.	(Sea Level Operation)**
XR161	1.3" W.C.	(Sea Level Operation)**
XR261	1.6" W.C.	(Sea Level Operation)**

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

Power Consumption @ 120 VAC	
XP101	40 - 49 watts
XP151	45 - 60 watts
XP201	45 - 66 watts
XR161	48 - 75 watts
XR261	65 - 105 watts

XP Series Inlet/Outlet: 4.5" OD (4.0" PVC Sched 40 size compatible)
XR Series Inlet/Outlet: 5.875" OD
Mounting: Mount on the duct pipe or with optional mounting bracket.
Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe
Storage temperature range: 32 - 100 degrees F.
Normal operating temperature range: -20 - 120 degrees F.
Maximum inlet air temperature: 80 degrees F.

Size: 9.5H" x 8.5" Dia. **Weight**: 6 lbs. (XR261 - 7 lbs)

Continuous Duty **Thermally protected**

Class B Insulation **3000 RPM**

Residential Use Only **Rated for Indoor or Outdoor use**

LISTED Electric Fan ETL® Tested to UL Std. 507
77728

GP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the GPx01 Series Fan:

Typical CFM Vs Static Suction "WC							
	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"
GP501	95	87	80	70	57	30	5
GP401	93	82	60	38	12	-	-
GP301	92	77	45	10	-	-	-
GP201	82	58	5	-	-	-	-

Maximum Recommended Operating Pressure*		
GP501	3.8" W.C.	(Sea Level Operation)**
GP401	3.0" W.C.	(Sea Level Operation)**
GP301	2.4" W.C.	(Sea Level Operation)**
GP201	1.8" W.C.	(Sea Level Operation)**

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

Power Consumption @ 120 VAC	
GP501	70 - 140 watts
GP401	60 - 110 watts
GP301	55 - 90 watts
GP201	40 - 60 watts

Inlet/Outlet: 3.5" OD (3.0" PVC Sched 40 size compatible)

Mounting: Fan may be mounted on the duct pipe or with integral flanges.

Weight: 12 lbs.

Size: 13H" x 12.5" x 12.5"

Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class B Insulation

3000 RPM

Thermally protected

Rated for Indoor or Outdoor Use

GP301C / GP501C Rated for Commercial Use

LISTED Electric Fan ETL® Tested to UL Std. 507
77728

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GPx01/XP/XR Series Fan for shipping damage within 15 days of receipt. Notify RadonAway of any damages immediately. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the GPx01/XP/XR Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPX01/XP/XR/RP Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE GPx01/XP/XR/RP SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No._____
Purchase Date_____

APPENDIX I

ANNUAL CERTIFICATION FORMS

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

SITE NO.: **C915208**

Site Name: **275 Franklin Street Site**

Site Address: 275-277 & 279 Franklin St. Zip Code: 14202

City/Town: Buffalo

County: Erie County

Current Use:

Intended Use:

Box 2

Verification of Site Details

		YES	NO
1.	Are the Site Details above, correct?	□	□
	If NO, are changes handwritten above or included on a separate sheet?	□	
2.	Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment since the initial/last certification?	□	□
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	□	□
3.	Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property since the initial/last certification?	□	□
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	□	□
4.	Has a change-of-use occurred since the initial/last certification?□	□	
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	□	
5.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), has any new information revealed that assumptions made in the Qualitative Exposure Assessment for offsite contamination are no longer valid?	□	□
	If YES, is the new information or evidence that new information has been previously submitted included with this Certification?	□	
6.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), are the assumptions in the Qualitative Exposure Assessment still valid (must be certified every five years) ?	□	□
	If NO, are changes in the assessment included with this certification?	□	

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

SITE NO.: C915208 **Box 3**

Description of Institutional Controls

1.
2.
3.
4.
5.

Box 4

Description of Engineering Controls

1.
2.
3.
4.
5.

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

SITE NO.: C915208 **Box 5**

Description of Institutional Controls

1. I certify by checking "YES" below that:

   a. the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b. to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and complete.

YES	NO
□	□

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   a. the Institutional Control(s) and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   b. nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   c. access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   d. nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   e. if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
□	□

3. If this site has an Operation and Maintenance (O&M) Plan (or equivalent as required in the Decision Document);

   I certify by checking "YES" below that the O&M Plan Requirements (or equivalent as required in the Decision Document) are being met.

YES	NO
□	□

4. If this site has a Monitoring Plan (or equivalent as required in the remedy selection document);

   I certify by checking "YES" below that the requirements of the Monitoring Plan (or equivalent as required in the remedy selection document) is being met.

YES	NO
□	□

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

SITE NO.: C915208 **Box 6**

IC Certifications

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 2 and/or 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I _____ at _____,
print name print business address

am certifying as _____(Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

_____ _____
Signature of Owner or Remedial Party Rendering Certification Date

Box 7

IC/EC Certifications

QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) SIGNATURE

I certify that all information and statements in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I _____ at _____,
print name print business address

am certifying as a Qualified Environmental Professional for the _____

(Owner or Remedial Party) for the Site named in the Site Details Section of this form.

_____ _____ _____
Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Stamp (if Required) Date

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

SITE NO.: **C915237**

Site Name: **432 Pearl Street Site**

Site Address: 267 Franklin St. & 432 Pearl St. Zip Code: 14202

City/Town: Buffalo

County: Erie County

Current Use:

Intended Use:

Box 2

Verification of Site Details

		YES	NO
1.	Are the Site Details above, correct?	□	□
	If NO, are changes handwritten above or included on a separate sheet?	□	
2.	Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment since the initial/last certification?	□	□
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	□	□
3.	Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property since the initial/last certification?	□	□
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	□	□
4.	Has a change-of-use occurred since the initial/last certification?□	□	
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	□	
5.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), has any new information revealed that assumptions made in the Qualitative Exposure Assessment for offsite contamination are no longer valid?	□	□
	If YES, is the new information or evidence that new information has been previously submitted included with this Certification?	□	
6.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), are the assumptions in the Qualitative Exposure Assessment still valid (must be certified every five years) ?	□	□
	If NO, are changes in the assessment included with this certification?	□	

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

SITE NO.: C915237 **Box 3**

Description of Institutional Controls

1.
2.
3.
4.
5.

Box 4

Description of Engineering Controls

1.
2.
3.
4.
5.

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

SITE NO.: C915237 **Box 5**

Description of Institutional Controls

1. I certify by checking "YES" below that:

   a. the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b. to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and complete.

YES	NO
□	□

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   a. the Institutional Control(s) and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   b. nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   c. access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   d. nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   e. if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
□	□

3. If this site has an Operation and Maintenance (O&M) Plan (or equivalent as required in the Decision Document);

   I certify by checking "YES" below that the O&M Plan Requirements (or equivalent as required in the Decision Document) are being met.

YES	NO
□	□

4. If this site has a Monitoring Plan (or equivalent as required in the remedy selection document);

   I certify by checking "YES" below that the requirements of the Monitoring Plan (or equivalent as required in the remedy selection document) is being met.

YES	NO
□	□

Enclosure 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

SITE NO.: C915237 **Box 6**

IC Certifications

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 2 and/or 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I _____ at _____,
print name print business address

am certifying as _____(Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

_____ _____
Signature of Owner or Remedial Party Rendering Certification Date

Box 7

IC/EC Certifications

QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) SIGNATURE

I certify that all information and statements in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I _____ at _____,
print name print business address

am certifying as a Qualified Environmental Professional for the _____

(Owner or Remedial Party) for the Site named in the Site Details Section of this form.

_____ _____ _____
Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Stamp (if Required) Date

INSTRUCTIONS

I. Verification of Site Details (Boxes 1 and 2):

Answer the six questions in the Verification of Site Details Section. Questions 5 and 6 only refer to sites in the Brownfield Cleanup Program. The Owner and/or Environmental Professional (QEP) may include handwritten changes and/or supporting documentation, as necessary.

II. Certification of Institutional / Engineering Controls (Boxes 3, 4, and 5)

1. Review the listed IC/ECs, confirming that all existing controls are listed, and that all existing controls are still applicable. If there is a control that is no longer applicable the Owner / Remedial Party is to petition the Department requesting approval to remove the control.

2. In Box 5, complete certifications for all Plan components, as applicable, by checking the corresponding checkbox.

3. If you cannot certify "YES" for each Control and/or certify the other SM Plan components that are applicable, continue to complete the remainder of the **Certification** form. Attach supporting documentation that explains why the **Certification** cannot be rendered, as well as a statement of proposed corrective measures, and an associated schedule for completing the corrective measures. Note that this **Certification** form must be submitted even if an IC or EC cannot be certified; however, the certification process will not be considered complete until corrective action is completed

   If the Department concurs with the explanation, the proposed corrective measures, and the proposed schedule, a letter authorizing the implementation of those corrective measures will be issued by the Department's Project Manager. Once the corrective measures are complete, a new Periodic Review Report (with IC/EC Certification) is to be submitted within 45 days to the Department. If the Department has any questions or concerns regarding the PRR and/or completion of the IC/EC Certification, the Project Manager will contact you.

III. IC/EC Certification by Signature (Boxes 6 and 7):

If you certified "YES" for each Control, please complete and sign the IC/EC Certifications page. Where the only control is an Institutional Control on the use of the property the certification statement in Box 6 shall be completed and may be made by the property owner. Where the site has Institutional and Engineering Controls, the certification statement in Box 7 must be completed by a Professional Engineer or Qualified Environmental Professional (see table below).

Table 1. Signature Requirements for Control Certification Page

Type of Control	Example of IC/EC	Required Signatures
EC which does not include a treatment system or engineered caps.	Fence, Clean Soil Cover, Individual House Water Treatment System, Vapor Mitigation System	A site or property owner or remedial party, and a QEP (P.E. license is not required).
EC that includes treatment system or an engineered cap.	Pump & Treat System providing hydraulic control of a plume, Part 360 Cap.	A site or property owner or remedial party, and a QEP with a P.E. license.

APPENDIX J

QUALITY ASSURANCE PROJECT PLAN

BROWNFIELD CLEANUP PROGRAM

APPENDIX J
QUALITY ASSURANCE PROJECT PLAN

275 FRANKLIN STREET SITE, BCP SITE NO. C915208
AND
432 PEARL STREET SITE NO. C915237
BUFFALO, NEW YORK

July 2017 0156-016-002

Prepared for:
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QUALITY ASSURANCE PROJECT PLAN (QAPP)
275 FRANKLIN STREET & 432 PEARL STREET SITES

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QUALITY ASSURANCE PROJECT PLAN (QAPP)
275 FRANKLIN STREET & 432 PEARL STREET SITES

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LIST OF TABLES

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) is an appendix to the Site Management Plan (SMP), a required element of the remedial program for the 275 Franklin Street and 432 Pearl Street Sites (hereinafter referred to as the "BCP Sites") under the New York State (NYS) Brownfield Cleanup Program (BCP), administered by New York State Department of Environmental Conservation (NYSDEC). The BCP Sites were remediated in accordance with Brownfield Cleanup Agreement (BCA) Index Nos. B9-0722-06-07 (275 Franklin Street Site) executed in October 2006 andC915237-10-10 (432 Pearl Street Site) executed in May 2011.

1.1 Site Location and Description

BDC owns the four adjoining parcels that are part of a common proposed redevelopment project. The properties are collectively referred to throughout this document as the BCP Sites and are identified as follows:

- BCP Site No. C915208, identified as the 275 Franklin Street Site and encompassing the following parcels:
  - Parcel 111.38-2-22, addressed as 275-277 Franklin Street, (± 0.14 acres)
  - Parcel 111.38-2-23, addressed as 279 Franklin Street, (± 0.13 acres)
- BCP Site No. C915237, identified as the 432 Pearl Street Site and encompassing the following parcels:
  - Parcel 111.38-2-20.1, addressed as 267 Franklin Street, (± 0.25 acres)
  - Parcel 111.38-2-4.1, addressed as 432 Pearl Street, (± 0.45 acres)

The Sites are improved with an apartment building and parking lots. The BCP Sites are bounded by a restaurant and surface parking lot to the north; Pearl Street to the east; a mixed use building to the south; and Franklin Street to the west.

1.2 Site History

The BCP Sites have been used for various purposes since the late 1800s. From at least 1951 through the early 2000s, 275-277 Franklin Street was used as a dry cleaner. The property located at 279 Franklin Street was used for residential purposes from the late 1800s

through at least 1951, and was a parking lot from at least 1981 to the present. In 1925, the 432 Pearl Street Site was used for residential and hot air heater manufacturing and by 1951 it was being used as residential and a parking lot. The property at 267 Franklin Street (part of the 432 Pearl Street Site) has been used as an apartment building since at least 1925.

Benchmark completed RI activities in November 2006, December 2006, and January 2007, and a supplement RI in April 2008 in order to fill in data gaps and investigate the quality of deeper groundwater on the BCP Sites.

An interim remedial measure (IRM) was conducted on the 275 Franklin Street Site from summer 2008 through fall 2009. Following submittal of the RI/AA/IRM Report in April 2010, NYSDEC required additional groundwater remedial measures beyond the proposed in-situ HRC injections in the vicinity of MW-5 "source area" on the 275 Franklin Street Site in order to mitigate off-site migration of cVOCs. In September 2011, BDC submitted an Additional IRM Work Plan to NYSDEC expanding the proposed IRM to include both the 275 Franklin Street BCP Site and the 267 Franklin Street parcel of the 432 Pearl Street Site. The Additional IRM Work Plan specifically proposed in-situ groundwater treatment at the source area and downgradient property boundary to mitigate off-site cVOC plume migration. NYSDEC required further assessment of deep groundwater on-site; therefore, BDC installed an additional deep groundwater well (MW-7) on the 267 Franklin Street parcel of the 432 Pearl Street Site in May 2012 and completed a round of comprehensive groundwater sampling, which included certain off-site wells as requested by NYSDEC.

The Revised RI/AA/IRM Report was submitted in January 2013. Following review of the report, NYSDEC provided additional comments in July 2013 and prepared draft Proposed Decision Documents for each BCP Site. The final RI/AA.IRM Report was submitted to NYSDEC in July 2013 and approved September 30, 2013. In April 2014 and March/April 2016, additional in-situ groundwater treatment was performed. In December 2016, source area soil/fill was excavated and a chemical oxidant was added to the excavation bottom to address residual impact. Two rounds of post-injection groundwater monitoring was performed in January and April 2017.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The following section provides a generic organization for sampling activities, including roles, responsibilities, and required qualifications of these organizations.

2.1 Management Responsibilities

It is the responsibility of the NYSDEC, in conjunction with the New York State Department of Health (NYSDOH), to review the project documents for completeness and conformance with the site-specific cleanup objectives and to make a decision to accept or reject these documents based on this review. The NYSDEC also has the responsibility and authority to review and approve all QA documentation collected during brownfield cleanup construction and to confirm that the QA Plan was followed.

2.2 Property Owner

The Site Owner or holder of the certificate of completion (COC) will be responsible for complying with the QA requirements as specified herein and for monitoring and controlling the quality of the Brownfield cleanup activities either directly or through their designated environmental consultant and/or legal counsel. The Owner will also have the authority to select Contractor(s) to assist them in fulfilling these responsibilities. The Owner is responsible for implementing the project, and has the authority to commit the resources necessary to meet project objectives and requirements.

2.3 Project Manager

The Project Manager has the responsibility for ensuring that the project meets the overall project objectives, reports directly to the Owner, coordinates with the NYSDEC/ NYSDOH Project Coordinators, and is responsible for technical and project oversight. The Project Manager will:

- Define project objectives and develop a detailed work plan schedule.
- Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task.
- Acquire and apply technical and corporate resources as needed to assure performance within budget and schedule constraints.

- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- Review the work performed on each task to assure its quality, responsiveness, and timeliness.
- Review and analyze overall task performance with respect to planned requirements and authorizations.
- Review and approve all deliverables before their submission to NYSDEC.
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- Ultimately be responsible for the preparation and quality of interim and final reports.
- Represent the project team at meetings.

2.4 Field Team Leader

The Field Team Leader (FTL) has the responsibility for implementation of specific project tasks identified at the Site, and is responsible for the supervision of project field personnel, subconsultants, and subcontractors. The FTL reports directly to the Project Manager. The FTL will:

- Define daily develop work activities.
- Orient field staff concerning the project's special considerations.
- Monitor and direct subcontractor personnel.
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness.
- Assure that field activities, including sample collection and handling, are carried out in accordance with this QAPP.

2.5 Quality Assurance (QA) Officer

The QA Officer will have direct access to corporate executive staff as necessary, to resolve any QA dispute, and is responsible for auditing the implementation of the QA program in conformance with the demands of specific investigations and policies, and NYSDEC requirements. Specific functions and duties include:

- Performing QA audits on various phases of the field operations.
- Reviewing and approving QA plans and procedures.
- Providing QA technical assistance to project staff.
- Reporting on the adequacy, status, and effectiveness of the QA program on a regular basis to the Project Manager for technical operations.
- Responsible for assuring third party data review of all sample results from the analytical laboratory.

2.6 Laboratory Responsibilities

Any environmental laboratory used for sample analysis for this Site must be an independent, NYSDOH Environmental Laboratory Approval Program (ELAP)-certified facility approved to perform the analyses prescribed herein.

- *Laboratory Director:*
  The Laboratory Director is a technical advisor and is responsible for summarizing and reporting overall unit performance. Responsibilities of the Laboratory Director include:
  - Provide technical, operational, and administrative leadership.
  - Allocation and management of personnel and equipment resources.
  - Quality performance of the facility.
  - Certification and accreditation activities.
  - Blind and reference sample analysis.

- *Quality Assurance Manager (QA Manager):*
  The QA Manager has the overall responsibility for data after it leaves the laboratory. The QA Manager will be independent of the laboratory but will communicate data issues through the Laboratory Director. In addition, the QA Manager will:
  - Oversee laboratory QA.
  - Oversee QA/QC documentation.
  - Conduct detailed data review.
  - Determine whether to implement laboratory corrective actions, if required.
  - Define appropriate laboratory QA procedures.
  - Prepare laboratory SOPs.

3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall objectives and criteria for assuring quality for this effort are discussed below. This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented. The objectives of this QAPP are to address the following:

- The procedures to be used to collect, preserve, package, and transport groundwater samples.
- Field data collection.
- Record keeping.
- Data management.
- Chain-of-custody procedures.
- Precision, accuracy, completeness, representativeness, for sample analysis and data management under EPA analytical methods.

Tables 1 and 2 provide analytical methods and detection/reporting limits for chemical parameters that may be analyzed. In addition, water levels and select water quality parameters (i.e., pH, turbidity, specific conductance, and temperature) will be measured in the field as described in the FOPs located in the SMP

The goals for precision, accuracy, and completeness intended for use on this project are discussed in Sections 3.1 through 3.3 of this QAPP. All data will be reported completely. No data will be omitted unless an error occurred in the analyses or the run was invalidated because of QC sample recovery or poor precision.

3.1 Precision

Precision is a measurement of the degree to which two or more measurements are in agreement, which is quantitatively assessed based on the standard deviation. Precision in the laboratory is assessed through the calculation of relative percent difference (RPD) and relative calculation of relative standard deviations (RSD) for three or more replicate samples. Table 3 provides general precision goals.

Laboratory precision will be assessed through the analysis of matrix spike/matrix spike duplicate (MS/MSD) and field duplicate samples for organic parameters. For inorganic parameters, precision will be assessed through the analysis of matrix spike/duplicates field

duplicate pairs. Precision for field parameters, including pH, turbidity, specific conductance, and temperature will be determined through duplicate analysis of 1 in every 20 samples. Table 4 provides precision control limits for field-measured parameters.

3.2 Accuracy

Accuracy is the degree of agreement between an observed value and an accepted reference of true value. Accuracy in the field is assessed through the use of field blanks and trip blanks and through the adherence to all sample handling, preservation, and holding times. One trip blank will accompany each batch of water matrix sample containers shipped to the laboratory for volatile organic chemical analysis. Laboratory accuracy is assessed through the analysis of a matrix spike/matrix spike duplicate (MS/MSD) (1 per 20 samples), standard reference materials (SRM), laboratory control samples (LCS), and surrogate compounds, and the determination of percent recoveries. The equation to be used for accuracy for this investigation is found in Section 10.1 of this QAPP. Table 3 gives accuracy control limits for the laboratory.

3.3 Completeness

Data completeness is a measure of the amount of valid data obtained from a prescribed measurement system as compared with that expected and required to meet the project goals. Laboratory and field completeness will be addressed by applying data quality checks and assessments described in Section 3.1 and 3.2 and Section 7.0 to ensure that the data collected are valid and significant.

As shown on Table 3, the laboratory completeness objectives will be 90 percent or greater. A third party data validator will follow procedures described in Section 7.2 to assess the completeness and validity of laboratory data deliverables. For this investigation, 100 percent of all laboratory analytical results will undergo third party data review. The completeness of an analysis will be documented by including in the report sufficient information to allow the data validator to assess the quality of the results.

Raw data such as chromatograms, spectra, calibration data, laboratory worksheets and notes, etc. will not be produced with the analytical data reporting package but will be stored with the sample results in the laboratory and made available upon request, if necessary, to substantiate analytical results. The raw data will be archived for at least two years by the

laboratory. The laboratory will retain all analytical information; regardless of whether the substantiation of results is requested.

3.4 Data Representativeness

Data representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. All proposed field-testing and measurement procedures were selected to maximize the degree to which the field data will represent the conditions at the Site, and the matrix being sampled or analyzed.

As described in Section 8.0, Performance System Audits and the proper execution of field activities are the main mechanism for ensuring data representativeness. Representativeness in the laboratory is ensured through the use of the proper analytical procedures, appropriate methods, meeting sample holding times, and analyzing and assessing field duplicate samples.

3.5 Level of QC Effort for Sample Parameters

Field blank, method blank, trip blank, field duplicate, laboratory duplicate, laboratory control, standard reference materials (SRM) and matrix spike samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. QC samples are discussed below.

- Field and trip blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field-sampling program. Field (equipment) blank samples are analyzed to check for procedural chemical constituents at the facility that may cause sample contamination. Trip blanks are used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage.
- Method blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures.
- Duplicate samples are analyzed to check for sampling and analytical reproducibility.

- MS/MSD and MS/Duplicate samples provide information about the effect of the sample matrix on the digestion and measurement methodology. Depending on site-specific circumstances, one MS/MSD or MS/Duplicate should be collected for every 20 or fewer investigative samples to be analyzed for organic and inorganic chemicals of a given matrix.

The general level of QC effort will be one field (blind) duplicate and one field blank (when non-dedicated equipment is used) for every 20 or fewer investigative samples of a given matrix. Additional sample volume will also be provided to the laboratory to allow one site-specific MS/MSD or MS/Duplicate for every 20 or fewer investigative samples of a given matrix. One trip blank consisting of distilled, deionized water will be included along with each sample delivery group of aqueous VOC samples.

4.0 CUSTODY PROCEDURES

Sample custody is controlled and maintained through the chain-of-custody procedures. Chain of custody is the means by which the possession and handling of samples will be tracked from the source (field) to their final disposition, the laboratory. A sample is considered to be in a person's custody if it is in the person's possession or it is in the person's view after being in his or her possession or it was in that person's possession and that person has locked it in a vehicle or room. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site.

4.1 Field Custody Procedures

Field logbooks and appropriate field forms will provide the means of recording data collection activities performed during the investigation. As such, entries will be described in as much detail as possible so that persons going to the facility could reconstruct a particular situation without reliance on memory. Field logbooks will be bound field survey books or notebooks. Each logbook will be identified by the project-specific document number. The title page of each logbook will contain the following:

- Person to whom the logbook is assigned
- Logbook number
- Project name
- Project start date
- End date

Entries into the logbook or appropriate field form will contain a variety of information. At the beginning of each logbook entry, the date, start time, weather, names of all sampling team members present, level of personal protection equipment being used, and the signature of the person making the entry will be entered. The names of visitors to the Site, field sampling or investigation team personnel and the purpose of their visit will also be recorded in the field logbook. Measurements made and samples collected will be recorded in the logbook and appropriate field form. All entries will be made in permanent ink, signed, and dated and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark that is signed and dated by the sampler. Whenever a sample location is surveyed, which includes compass and distance measurements or, latitude

and longitude information (e.g., obtained by using a global positioning system) the location information shall be recorded. In the event that photographs are taken to document field activities, the number and brief description of the photographs taken will also be recorded. All equipment used to make measurements will be identified, along with the date of calibration.

Samples will be collected following the sampling procedures documented in this QAPP. The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, volume and number of containers. Sample identification numbers will be assigned prior to sample collection. Field duplicate samples, which will receive a separate sample identification number, will be noted under sample description.

The sample packaging and shipment procedures summarized below will ensure that the samples will arrive at the laboratory with the chain-of-custody intact. The protocol for specific sample numbering and other sample designations is included in an FOP provided in Appendix A of this QAPP. Examples of field custody documents and instructions for completion are also presented in Appendix A of this QAPP.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. Field procedures have been designed such that as few people as possible will handle the samples.
- All bottles will be identified by the use of sample tags with sample numbers, sampling locations, date/time of collection, and type of analysis. The sample numbering system is presented in the FOP.
- Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample label because the ballpoint pen would not function in freezing weather.
- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage area.

Samples will be properly packaged and cooled to 4°C for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and

secured to the inside top of each sample box or cooler. Shipping containers will be locked and secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by the field team leader. The cooler will be strapped shut with strapping tape in at least two locations.

4.2 Laboratory Custody Procedures

4.2.1 Sample Receipt

A sample custodian is responsible for receiving samples; completing chain-of-custody records; determining and documenting the condition of samples received through the Cooler Receipt and Preservation Form; logging samples into the system based on the order of log-in; and storing samples in appropriate limited-access storage areas. Chain-of-custody documentation is also maintained for the transfer of samples between the laboratory, and for shipment of samples to subcontracted laboratories.

Upon sample receipt, an inventory of shipment contents is compared with the chain-of-custody record, and any discrepancies, including broken containers, inappropriate container materials or preservatives, headspace in volatile organic samples, and incorrect or unclear sample identification, are documented and communicated to the appropriate project manager.

Each sample is given a unique laboratory code and an analytical request form is generated. The analytical request contains pertinent information for each sample, including:

- Client name
- Project number
- Task number
- Purchase order number
- Air bill number
- Chain-of-custody number
- Number of samples
- Sample descriptions
- Sample matrix type
- Date and time of sampling

- Analysis due dates
- Date and time of receipt by lab
- Client sample identification
- Any comments regarding special instructions or discrepancies

4.2.2 Sample Storage

Samples are stored in secure limited-access areas. Walk-in coolers or refrigerators are maintained at 4°C (±2°C) or as required by the applicable regulatory program. The temperatures of all refrigerated storage areas are monitored and recorded a minimum of once per day. Deviations of temperature from the applicable range require corrective action, including moving samples to another storage location if necessary.

4.2.3 Sample Custody

Sample custody, as defined by this document, is when any of the following occur:

- It is in someone's actual possession.
- It is in someone's view after being in his or her physical possession.
- It was in someone's possession and then locked, sealed, or secured in a manner that prevents unsuspected tampering.
- It is placed in a designated and secured area.

Samples are removed from storage areas by the sample custodian or analysts and transported to secure laboratory areas for analysis. Access to the laboratory and sample storage areas is restricted to laboratory personnel and escorted visitors only; all areas of the laboratory are therefore considered secure. If required by the applicable regulatory program, internal chain-of-custody is documented in a log by the person moving the samples between laboratory and storage areas.

Laboratory documentation used to establish chain-of-custody and sample identification may include the following:

- Field chain-of-custody forms or other paperwork that arrives with the sample.
- The laboratory chain-of-custody.
- Sample labels or tags are attached to each sample container.
- Sample custody seals.

- Sample preparation logs (i.e., extraction and digestion information) recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist.
- Sample analysis logs (e.g., metals, GC/MS, etc.) information recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist.
- Sample storage log (same as the laboratory chain-of-custody).
- Sample disposition log, which documents sample disposal by a contracted waste disposal company.

4.2.4 Sample Tracking

All samples are maintained in the appropriate coolers prior to and after analysis. The analysts remove and return their samples as needed. Samples that require internal chain-of-custody are relinquished to the analysts by the sample custodians. The analyst and sample custodian must sign the original chain-of-custody relinquishing custody of the samples from the sample custodian to the analyst. When the samples are returned, the analyst will sign the original chain-of-custody returning sample custody to the sample custodian. Sample extracts are relinquished to the instrumentation analysts by the preparatory analysts. Each preparation department tracks internal chain-of-custody through their logbooks/ spreadsheets.

Any change in the sample during the time of custody will be noted on the chain-of-custody (e.g., sample breakage or depletion).

4.2.5 Sample Disposal

A minimum of 30 days following completion of the project, or after a period of time specified by any applicable project requirements, sample disposal is performed in compliance with federal, state, and local regulations. Alternatively, samples may be returned to the client by mutual agreement. All available data for each sample, including laboratory analysis results and any information provided by the client, are reviewed before sample disposal.

All samples are characterized according to hazardous/non-hazardous waste criteria and are segregated accordingly. All hazardous waste samples are disposed of according to formal procedures by the laboratory. It should be noted that all waste produced at the

laboratory, including the laboratory's own various hazardous waste streams, is treated in accordance with all applicable local and Federal laws.

Complete internal chain-of-custody documentation is maintained for some samples from initial receipt through final disposal. This ensures that an accurate history of the sample from "cradle to grave" is generated.

5.0 CALIBRATION PROCEDURES AND FREQUENCY

This section describes the calibration procedures and the frequency at which these procedures will be performed for both field and laboratory instruments.

5.1 Field Instrument Calibration

Quantitative field data to be obtained during groundwater sampling include pH, turbidity, specific conductance, temperature, and depth to groundwater. Quantitative water level measurements will be obtained with an electronic sounder or steel tape, which require no calibration. Quantitative field data to be obtained during soil sampling include screening for the presence of volatile organic constituents using a photoionization detector (PID). Field instruments used to monitor for these parameters will be calibrated in accordance with their manufacturer's recommendations.

5.2 Laboratory Instrument Calibration

All equipment and instruments used at the laboratory will be operated, maintained, and calibrated according to the manufacturer's guidelines and recommendations, as well as to criteria set forth in the applicable analytical methodology. Operation and calibration will be performed by personnel who have been properly trained in these procedures.

6.0 ANALYTICAL PROCEDURES

The SMP describes the laboratory methods to be employed for post-remedial groundwater sampling. Samples will be analyzed by a NYSDOH ELAP-certified laboratory employing the appropriate analytical protocols and quality assurance procedures for the respective NYSDEC or USEPA methods. Tables 1 and 2 list the constituents of concern (COCs) for soil and groundwater. Table 6 is a summary of the sample containers, volume, preservatives, and holding time requirements.

7.0 DATA REDUCTION, VALIDATION, AND REPORTING

All data generated through field activities, or by the laboratory operation shall be reduced and validated (as required in the SMP) before reported.

7.1 Data Reduction

7.1.1 Field Data Reduction Procedures

Field measurements of pH, turbidity, temperature, specific conductance, water level, and volatile organic vapor content (via the PID) are read directly in the units of final use, as discussed in this QAPP and listed in Table 5. Field personnel are responsible for monitoring the collection and reporting of field data. Field personnel will review field measurements at the time of measurement and will re-measure a parameter as necessary to assure quality and accuracy are maintained.

Field data will be recorded on appropriate field data record forms or the project field book as they are collected and will be maintained in the project file. The Project QA Officer will review field procedures and compare field data to previous measurements to assess comparability and accuracy of the field data measurements.

7.1.2 Laboratory Data Reduction Procedures

Results of laboratory analyses will be reported in units of final use as listed in Table 5. Laboratory calculations will be performed as prescribed for a given analytical method or in conformance with acceptable laboratory standards at the time the calculation is performed.

The laboratory will retain quality assurance/quality control (QA/QC) records for at least five years. Original laboratory reports will be stored in the project files. Copies of raw data will be available for review at the laboratory. Copies of raw data also may be requested as part of the QA/QC review.

7.2 Data Usability Evaluation

The laboratory will provide a case narrative that will identify any issues affecting sample integrity and/or analytical reliability. A Data Usability Summary Report (DUSR) will be prepared including the results of data validation for each analytical method. The DUSR

will include a discussion of the field QC sample results and any potential positive or negative bias indicated by the QC data.

7.3 Data Reporting

7.3.1 Field Data Reporting

All field documents will be accounted for when they are completed. Accountable documents include items such as field notebooks, sample logs, field data records, photographs, data packages, computer disks, and reports.

7.3.2 Laboratory Data Reporting

Analytical data will be summarized in tabular format with such information as sample identification, sample matrix description, parameters analyzed and their corresponding detected concentrations, and the detection limit. Analytical results will be incorporated into reports as data tables, maps showing sampling locations and analytical results, and supporting text. An electronic data deliverable (EDD) will be submitted electronically to the NYSDEC Environmental Information Management System.

8.0 PERFORMANCE SYSTEM AUDITS AND FREQUENCY

8.1 Field Performance and System Audits

8.1.1 Internal Field Audits

The QA Officer may conduct internal audits of field activities including sampling and field measurements. These audits will verify that all established procedures are being followed. Internal field audits will be conducted at least once at the beginning of the Site sample collection activities. Project duration may warrant subsequent audits on a monthly basis. The audit program consists of the following:

- Observation of field activities to confirm that procedures are performed in accordance with project protocols and standard accepted methods.
- Review daily field records, monitoring well sampling records, and any other data collection sheets during and after field measurements.

8.1.2 External Field Audits

The NYSDEC Site Project Coordinator may conduct external field audits. External field audits may be conducted any time during the field operations. These audits may or may not be announced and are at the discretion of the NYSDEC.

8.2 Laboratory System Audits

The adequacy and implementation of a laboratory's QA Plan are assessed on a continual basis through systems and performance audits. Systems audits evaluate practice against established quality system objectives and requirements. Performance audits measure the comparability and accuracy of laboratory data through the analysis of reference materials for which the true value is unknown to the analyst. Audits may be performed by the laboratory (internal), or by clients, regulatory agencies, or accreditation bodies (external).

9.0 PREVENTATIVE MAINTENANCE

Each piece of field equipment is checked according to its routine maintenance schedule and before field activities begin. Field equipment that may be used at the Site includes:

- Photoionization detector (PID)
- Water quality meters (includes pH, turbidity, temperature, Eh, and specific conductance)
- Electric water level indicator

Field personnel will report all equipment maintenance and/or replacement needs to the Project QA Officer and will record the information on the daily field record.

10.0 DATA PRECISION, ACCURACY, AND COMPLETENESS EVALUATION

10.1 Accuracy Assessment

Data accuracy, which is assessed for laboratory data only, is based on recoveries, expressed as the percentage of the true (known) concentration, from laboratory spiked samples and QA/QC samples generated by the analytical laboratory.

Percent recovery (%R) for MS/MSD results is determined according to the following equation:

$$R\% = \frac{(A - B) \times 100}{T}$$

Where A = measured concentration after spiking
B = background concentration
T = known true value of spike

Percent recovery (%R) for LCS and surrogate compound results is determined according to the following equation:

$$R\% = \frac{\text{Experimental Concentration}}{\text{Known amount added}} \times 100$$

This information is reviewed periodically by the Project Manager or Project QA Officer. Table 3 presents the goals for the recovery of any constituent in a spiked or QA/QC sample. Table 4 summarizes the accuracy goals for data generated in the field.

10.2 Precision Assessment

For data generated by the laboratory, data precision is estimated by comparing analytical results from duplicate samples. The comparison is made by calculating the relative percent difference (RPD) given by:

$$RPD\% = \frac{2(S_1 - S_2)}{S1 + S2} \times 100$$

Where S_1 = sample result
S_2 = duplicate result

This information is calculated and reviewed periodically by the Project Manager and/or Project QA Officer. Table 3 presents the goals for data precision for duplicate samples. Table 4 summarizes the precision goals for data generated in the field.

10.3 Completeness Assessment

Data completeness will be evaluated by comparing the objectives of sampling efforts with the data obtained and determining whether there are any shortcomings in required information. Completeness is defined as the percentage of valid results according to the equation below:

$$\% \text{ completeness} = \frac{A}{B} \times 100$$

Where: A = number of valid results;
B = total number of possible results

Table 3 presents the goals for data completeness for laboratory measurements. Table 4 summarizes the completeness goals for data generated in the field.

10.4 Assessment of Data

To assess the integrity of the data generated during this investigation, the Project Manager and QA Officer will review the laboratory analytical data, field data and DUSR in accordance with procedures and protocols outlined in this QAPP. An assessment will be made to determine if the project objectives have been achieved and meet objectives for data integrity.

11.0 CORRECTIVE ACTION

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or out of quality control performance that can affect data quality. Corrective action can occur during field activities, laboratory analyses, data validation, and data assessment. All corrective action proposed and implemented should be documented in the regular quality assurance reports to management. Corrective action should be implemented only after approval by the Project Manager, or his/her designee. If immediate corrective action is required, approvals secured by telephone from the Project Manager should be documented in an additional memorandum.

11.1 Field Corrective Action

If errors in field procedures are discovered during the observation or review of field activities by the Project QA Officer or his/her designee, corrective action will be initiated. Nonconformance to the QA/QC requirements of the field operating procedures will be identified by field audits or immediately by project staff who know or suspect that a procedure is not being performed in accordance with the requirements. The Project QA Officer or his designee will be informed immediately upon discovery of all deficiencies. Timely action will be taken if corrective action is necessary.

Corrective action in the field may be needed when the sample network is changed (i.e., more/less samples, sampling locations other than those specified in the Work Plan, etc.) or when sampling procedures and/or field analytical procedures require modification due to unexpected conditions. In general, the Project Manager and QA Officer may identify the need for corrective action. The Project Manager will approve the corrective measure that will be implemented by the field team. It will be the responsibility of the Project Manager to ensure that corrective action has been implemented.

If the corrective action will supplement the existing sampling using existing and approved procedures in the QAPP, corrective action approved by the Project Manager will be documented. If the corrective actions result in less samples (or analytical fractions), alternate locations, etc., which may result in non-achievement of project QA objectives, it will be necessary that all levels of project management, including the NYSDEC Project Coordinator, concur with the proposed action.

Corrective actions will be implemented and documented in the project field record book. No staff member will initiate corrective action without prior communication of findings through the proper channels. If corrective actions are insufficient, work may be stopped by the NYSDEC Project Coordinator.

If at any time a corrective action issue that directly impacts project data quality objectives is identified, the NYSDEC Project Coordinator will be notified immediately.

11.2 Laboratory Corrective Action

Corrective actions may be initiated if the quality assurance goals are not achieved. The initial step in a corrective action is to instruct the analytical laboratory to examine its procedures to assess whether analytical or computational errors caused the anomalous result. If no error in laboratory procedures or sample collection and handling procedures can be identified, then the Project Manager will assess whether reanalysis or resampling is required or whether any protocol should be modified for future sampling events.

11.3 Data Validation & Assessment Corrective Action

The need for corrective action may be identified during the data validation or assessment processes. Potential types of corrective action may include resampling by the field team, or reinjection/reanalysis of samples by the laboratory.

These actions are dependent upon the ability to mobilize the field team, whether the data to be collected is necessary to meet the QA objectives (e.g., the holding time for samples is not exceeded, etc.). If the data validator identifies a corrective action situation, the Project Manager will be responsible for approving the corrective action implementation. All required corrective actions will be documented by the laboratory Quality Assurance Coordinator.

12.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Periodic reports summarizing certain field activities may be required at the Site. Those reports will be the responsibility of the Project Manager and will include the QA Officers input on the accuracy, precision, and completeness of the data, as well as the results of the performance and system audits, and any corrective action needed or taken during the project.

12.1 Contents of Project QA Reports

The progress reports will contain, on a routine basis, a QA section describing all results of field and laboratory audits, all information generated during the period of work activities reflecting on the achievement of specific DQOs, and a summary of corrective action that was implemented, and its immediate results on the project. The status of the project with respect to the Project Schedule included in this QAPP will be determined. Whenever necessary, updates on training provided, changes in key personnel, anticipated problems in the field or laboratory for the coming month that could bear on data quality along with proposed solutions, will be reported. All QA reports will be prepared in written, final format by the project manager or his designee. To the extent possible, assessment of the project should also be performed on the basis of available QC data and overall results in relation to originally targeted objectives.

In the event of an emergency, or in case it is essential to implement corrective action immediately, QA reports can be made by telephone to the appropriate individuals, as identified in the Project Organization and Corrective Action sections of this QAPP. However, these events, and their resolution will be addressed thoroughly in the next periodic progress report.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

CONSTITUENTS OF CONCERN
FOR SOIL

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TCL Volatile Organic Compounds: (67 compounds) (ug/Kg)				
1,1,1-Trichloroethane	*71-55-6*	8260B	5	0.36
1,1,2,2-Tetrachloroethane	*79-34-5*	8260B	5	0.81
1,1,2-Trichloro-1,2,2-trifluoroethane	*76-13-1*	8260B	5	1.14
1,1,2-Trichloroethane	*79-00-5*	8260B	5	0.65
1,1-Dichloroethane	*75-34-3*	8260B	5	0.61
1,1-Dichloroethene	*75-35-4*	8260B	5	0.61
1,2,3-Trichlorobenzene	*87-61-6*	8260B	5	0.53
1,2,4-Trichlorobenzene	*120-82-1*	8260B	5	0.30
1,2-Dibromo-3-chloropropane	*96-12-8*	8260B	5	2.50
1,2-Dibromoethane	*106-93-4*	8260B	5	0.64
1,2-Dichlorobenzene	*95-50-1*	8260B	5	0.39
1,2-Dichloroethane	*107-06-2*	8260B	5	0.25
1,2-Dichloropropane	*78-87-5*	8260B	5	2.50
1,3-Dichlorobenzene	*541-73-1*	8260B	5	0.26
1,4-Dichlorobenzene	*106-46-7*	8260B	5	0.70
2-Butanone (MEK)	*78-93-3*	8260B	25	1.83
2-Hexanone	*591-78-6*	8260B	25	2.50
4-Methyl-2-pentanone (MIBK)	*108-10-1*	8260B	25	1.64
Acetone	*67-64-1*	8260B	25	4.21
Benzene	*71-43-2*	8260B	5	0.25
Bromochloromethane	*74-97-5*	8260B	5	0.36
Bromodichloromethane	*75-27-4*	8260B	5	0.67
Bromoform	*75-25-2*	8260B	5	2.50
Bromomethane	*74-83-9*	8260B	5	0.45
Carbon Disulfide	*75-15-0*	8260B	5	2.50
Carbon Tetrachloride	*56-23-5*	8260B	5	0.48
Chlorobenzene	*108-90-7*	8260B	5	0.66
Chloroethane	*75-00-3*	8260B	5	1.13
Chloroform	*67-66-3*	8260B	5	0.31
Chloromethane	*74-87-3*	8260B	5	0.30
cis-1,2-Dichloroethene	*156-59-2*	8260B	5	0.64
cis-1,3-Dichloropropene	*10061-01-5*	8260B	5	0.72
Cyclohexane	*110-82-7*	8260B	5	0.70
Dibromochloromethane	*124-48-1*	8260B	5	0.64
Dicholorodifluoromethane	*75-71-8*	8260B	5	0.41
Ethylbenzene	*100-41-4*	8260B	5	0.35
Isopropylbenzene	*98-82-8*	8260B	5	0.75
Methyl Acetate	*79-20-9*	8260B	5	3.00
Methyl tert-Butyl Ether	*1634-04-4*	8260B	5	0.49
Methylcyclohexane	*108-87-2*	8260B	5	0.76
Methylene Chloride	*75-09-2*	8260B	5	2.30
Styrene	*100-42-5*	8260B	5	0.25
Tetrachloroethene	*127-18-4*	8260B	5	0.67
Toluene	*108-88-3*	8260B	5	0.38
trans-1, 2-dichloroethene	*156-60-5*	8260B	5	0.52
trans-1,3-Dichloropropene	*10061-02-6*	8260B	5	2.20
Trichloroethene	*79-01-6*	8260B	5	1.10
Trichlorofluoromethane	*75-69-4*	8260B	5	0.47
Vinyl Chloride	*75-01-4*	8260B	5	0.61
m-Xylenes	*108-38-3*	8260B	10	0.84
p-Xylenes	*106-42-3*	8260B	10	0.84
o-Xylenes	*95-47-6*	8260B	5	0.65
T. Xylenes	*1330-20-7*	8260B	10	0.84

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

CONSTITUENTS OF CONCERN
FOR SOIL

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TCL Volatile Organic Compounds: (67 compounds) (ug/Kg)				
4-Chloro-3-methylphenol	*59-50-7*	N/A	N/A	N/A
2-Chlorophenol	*95-57-8*	N/A	N/A	N/A
2-Methylphenol	*95-48-7*	N/A	N/A	N/A
4-Methylphenol	*106-44-5*	N/A	N/A	N/A
2,4-Dichlorophenol	*120-83-2*	N/A	N/A	N/A
2,4-Dimethylphenol	*105-67-9*	N/A	N/A	N/A
2,4-Dinitrophenol	*51-28-5*	N/A	N/A	N/A
4,6-Dinitro-2-Methylphenol	*534-52-1*	N/A	N/A	N/A
2-Nitrophenol	*88-75-5*	N/A	N/A	N/A
4-Nitrophenol	*100-02-7*	N/A	N/A	N/A
Pentachlorophenol	*87-86-5*	N/A	N/A	N/A
Phenol	*108-95-2*	N/A	N/A	N/A
2,4,5-Trichlorophenol	*95-95-4*	N/A	N/A	N/A
2,4,6-Trichlorophenol	*88-06-2*	N/A	N/A	N/A
TCL Semi-Volatile Organic Compounds (full list): (69 compounds) (ug/kg) ***[includes Base-Neutrals (black) and Acid Extractables (blue)]***				
Acenaphthene	*83-32-9*	8270C	170	2.00
Acenaphthylene	*208-96-8*	8270C	170	1.40
Anthracene	*120-12-7*	8270C	170	4.32
Benzo(a)anthracene	*56-55-3*	8270C	170	2.91
Benzo(a)pyrene	*50-32-8*	8270C	170	4.06
Benzo(b)fluoranthene	*205-99-2*	8270C	170	3.28
Benzo(g,h,i)perylene	*191-24-2*	8270C	170	2.03
Benzo(k)fluoranthene	*207-08-9*	8270C	170	1.86
Benzyl alcohol	*100-51-6*	8270C	330	8.07
bis(2-Chloroethoxy)methane	*111-91-1*	8270C	170	9.18
bis(2-Chloroethyl)ether	*111-44-4*	8270C	170	14.60
2,2'-oxybis(1-chloropropane); bis(2-chloroisopropyl)ether	*108-60-1*	8270C	170	17.60
bis(2-Ethylhexyl)phthalate	*117-81-7*	8270C	170	54.40
Butyl benzyl phthalate	*85-68-7*	8270C	170	45.30
4-Bromophenyl phenyl ether	*101-55-3*	8270C	170	53.70
4-Chloroaniline	*106-47-8*	8270C	170	49.50
4-Chloro-3-methylphenol	*59-50-7*	8270C	170	6.94
2-Chloronaphthalene	*91-58-7*	8270C	170	11.30
2-Chlorophenol	*95-57-8*	8270C	170	8.59
4-Chlorophenyl-phenylether	*7005-72-3*	8270C	170	3.60
Chrysene	*218-01-9*	8270C	170	1.69
Dibenzo(a,h)anthracene	*53-70-3*	8270C	170	1.99
Dibenzofuran	*132-64-9*	8270C	170	1.76
3,3'-Dichlorobenzidine	*91-94-1*	8270C	170	148.00
2,4-Dichlorophenol	*120-83-2*	8270C	170	8.85
1,2-Dichlorobenzene	*95-50-1*	8270C	330	3.23
1,3-Dichlorobenzene	*541-73-1*	8270C	330	3.02
1,4-Dichlorobenzene	*106-46-7*	8270C	330	2.22
Diethyl phthalate	*84-66-2*	8270C	170	5.10
2,4-Dimethylphenol	*105-67-9*	8270C	170	45.60
Dimethyl phthalate	*131-11-3*	8270C	170	4.40
Di-n-butyl phthalate	*84-74-2*	8270C	170	58.30
Di-n-octyl phthalate	*117-84-0*	8270C	170	3.95
4,6-Dinitro-2-methylphenol	*534-52-1*	8270C	330	58.30
2,4-Dinitrophenol	*51-28-5*	8270C	330	59.10
2,4-Dinitrotoluene	*121-14-2*	8270C	170	26.10

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 1

CONSTITUENTS OF CONCERN
FOR SOIL

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TCL Semi-Volatile Organic Compounds (full list): (69 compounds) (ug/kg) ***[includes Base-Neutrals (black) and Acid Extractables (blue)]***				
2,6-Dinitrotoluene	*606-20-2*	8270C	170	41.30
Fluoranthene	*206-44-0*	8270C	170	2.45
Fluorene	*86-73-7*	8270C	170	3.90
Hexachlorobenzene	*118-74-1*	8270C	170	8.39
Hexachlorobutadiene	*87-68-3*	8270C	170	8.64
Hexachlorocyclopentadiene	*77-47-4*	8270C	170	51.00
Hexachloroethane	*67-72-1*	8270C	170	13.10
Indeno(1,2,3-cd)pyrene	*193-39-5*	8270C	170	4.67
Isophorone	*78-59-1*	8270C	170	8.43
2-Methylnaphthalene	*91-57-6*	8270C	170	2.04
2-Methylphenol (o-Cresol)	*95-48-7*	8270C	170	5.20
4-Methylphenol (p-Cresol)	*106-44-5*	8270C	330	9.40
Naphthalene	*91-20-3*	8270C	170	2.80
2-Nitroaniline	*88-74-4*	8270C	330	54.10
3-Nitroaniline	*99-09-2*	8270C	330	38.80
4-Nitroaniline	*100-01-6*	8270C	330	18.90
Nitrobenzene	*98-95-3*	8270C	170	7.48
2-Nitrophenol	*88-75-5*	8270C	330	7.71
4-Nitrophenol	*100-02-7*	8270C	330	40.90
N-Nitrosodiphenylamine	*86-30-6*	8270C	170	9.22
N-Nitroso-di-n-propylamine	*621-64-7*	8270C	170	13.40
Pentachlorophenol	*87-86-5*	8270C	330	57.90
Phenanthrene	*85-01-8*	8270C	170	3.54
Phenol	*108-95-2*	8270C	170	17.80
Pyrene	*129-00-0*	8270C	170	1.09
1,2,4-Trichlorobenzene	*120-82-1*	8270C	330	4.83
2,4,5-Trichlorophenol	*95-95-4*	8270C	170	36.80
2,4,6-Trichlorophenol	*88-06-2*	8270C	170	11.10
TAL Metals (modified): (12 compounds) (mg/Kg)				
Antimony	*7440-38-2*	6010B	15	0.4
Arsenic	*7440-38-2*	6010B	2	0.4
Barium	*7440-39-3*	6010B	0.5	0.11
Cadmium	*7440-43-9*	6010B	0.2	0.03
Chromium	*7440-47-3*	6010B	0.5	0.2
Lead	*7439-92-1*	6010B	1	0.24
Mercury	*7439-97-6*	7471A	0.02	0.0081
Nickel	*7440-02-0*	6010B	5	0.23
Potassium	*7440-09-7*	6010B	30	20
Selenium	*7782-49-2*	6010B	4	0.4
Silver	*7440-22-4*	6010B	0.6	0.2
Thallium	*7440-28-0*	6010B	6	0.3

Notes:

1. Analytes as per NYSDEC and USEPA list of parameters.
2. Analytical methods per USEPA publication, SW-846, "Test Methods for Evaluating Solid Waste", Third Edition.

Acronyms/Abbreviations:

CAS = Chemical Abstracts Service registry number.
MDL = Method Detection Limit provided by STL
PQL = Practical Quantitation Limit
mg/kg = milligrams per kilogram
ug/kg = micrograms per kilogram

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2

CONSTITUENTS OF CONCERN FOR GROUNDWATER

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TCL Volatile Organic Compounds: (67 compounds) (ug/L)				
1,1,1-Trichloroethane	*71-55-6*	8260B	1	0.82
1,1,2,2-Tetrachloroethane	*79-34-5*	8260B	1	0.21
1,1,2-Trichloro-1,2,2-trifluoroethane	*76-13-1*	8260B	1	0.31
1,1,2-Trichloroethane	*79-00-5*	8260B	1	0.23
1,1-Dichloroethane	*75-34-3*	8260B	1	0.38
1,1-Dichloroethene	*75-35-4*	8260B	1	0.29
1,2,3-Trichlorobenzene	*87-61-6*	8260B	1	0.41
1,2,4-Trichlorobenzene	*120-82-1*	8260B	1	0.41
1,2-Dibromo-3-chloropropane	*96-12-8*	8260B	1	0.39
1,2-Dibromoethane	*106-93-4*	8260B	1	0.73
1,2-Dichlorobenzene	*95-50-1*	8260B	1	0.79
1,2-Dichloroethane	*107-06-2*	8260B	1	0.21
1,2-Dichloropropane	*78-87-5*	8260B	1	0.72
1,3-Dichlorobenzene	*541-73-1*	8260B	1	0.78
1,4-Dichlorobenzene	*106-46-7*	8260B	1	0.84
2-Butanone (MEK)	*78-93-3*	8260B	10	1.32
2-Hexanone	*591-78-6*	8260B	5	1.24
4-Methyl-2-pentanone (MIBK)	*108-10-1*	8260B	5	2.10
Acetone	*67-64-1*	8260B	10	3.00
Benzene	*71-43-2*	8260B	1	0.41
Bromochloromethane	*74-97-5*	8260B	1	0.87
Bromodichloromethane	*75-27-4*	8260B	1	0.39
Bromoform	*75-25-2*	8260B	1	0.26
Bromomethane	*74-83-9*	8260B	1	0.69
Carbon Disulfide	*75-15-0*	8260B	1	0.19
Carbon Tetrachloride	*56-23-5*	8260B	1	0.27
Chlorobenzene	*108-90-7*	8260B	1	0.75
Chloroethane	*75-00-3*	8260B	1	0.32
Chloroform	*67-66-3*	8260B	1	0.34
Chloromethane	*74-87-3*	8260B	1	0.35
cis-1,2-Dichloroethene	*156-59-2*	8260B	1	0.81
cis-1,3-Dichloropropene	*10061-01-5*	8260B	1	0.36
Cyclohexane	*110-82-7*	8260B	1	0.18
Dibromochloromethane	*124-48-1*	8260B	1	0.32
Dicholorodifluoromethane	*75-71-8*	8260B	1	0.68
Ethylbenzene	*100-41-4*	8260B	1	0.74
Isopropylbenzene	*98-82-8*	8260B	1	0.79

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2

CONSTITUENTS OF CONCERN FOR GROUNDWATER

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TCL Volatile Organic Compounds: (67 compounds) (ug/L)				
Methyl Acetate	*79-20-9*	8260B	2.5	0.50
Methyl tert-Butyl Ether	*1634-04-4*	8260B	1	0.16
Methylcyclohexane	*108-87-2*	8260B	1	0.16
Methylene Chloride	*75-09-2*	8260B	1	0.44
Styrene	*100-42-5*	8260B	1	0.73
Tetrachloroethene	*127-18-4*	8260B	1	0.36
Toluene	*108-88-3*	8260B	1	0.51
trans-1, 2-dichloroethene	*156-60-5*	8260B	1	0.90
trans-1,3-Dichloropropene	*10061-02-6*	8260B	1	0.37
Trichloroethene	*79-01-6*	8260B	1	0.46
Trichlorofluoromethane	*75-69-4*	8260B	1	0.88
Vinyl Chloride	*75-01-4*	8260B	1	0.90
m-Xylenes	*108-38-3*	8260B	2	0.66
p-Xylenes	*106-42-3*	8260B	2	0.66
o-Xylenes	*95-47-6*	8260B	1	0.76
T. Xylenes	*1330-20-7*	8260B	2	0.66
4-Chloro-3-methylphenol	*59-50-7*	N/A	N/A	N/A
2-Chlorophenol	*95-57-8*	N/A	N/A	N/A
2-Methylphenol	*95-48-7*	N/A	N/A	N/A
4-Methylphenol	*106-44-5*	N/A	N/A	N/A
2,4-Dichlorophenol	*120-83-2*	N/A	N/A	N/A
2,4-Dimethylphenol	*105-67-9*	N/A	N/A	N/A
2,4-Dinitrophenol	*51-28-5*	N/A	N/A	N/A
4,6-Dinitro-2-Methylphenol	*534-52-1*	N/A	N/A	N/A
2-Nitrophenol	*88-75-5*	N/A	N/A	N/A
4-Nitrophenol	*100-02-7*	N/A	N/A	N/A
Pentachlorophenol	*87-86-5*	N/A	N/A	N/A
Phenol	*108-95-2*	N/A	N/A	N/A
2,4,5-Trichlorophenol	*95-95-4*	N/A	N/A	N/A
2,4,6-Trichlorophenol	*88-06-2*	N/A	N/A	N/A

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2

CONSTITUENTS OF CONCERN FOR GROUNDWATER

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TCL Semi-Volatile Organic Compounds (full list): (69 compounds) (ug/L) [includes Base-Neutrals (black) and Acid Extractables (blue)]				
Acenaphthene	*83-32-9*	8270C	5	0.41
Acenaphthylene	*208-96-8*	8270C	5	0.38
Anthracene	*120-12-7*	8270C	5	0.28
Benzo(a)anthracene	*56-55-3*	8270C	5	0.36
Benzo(a)pyrene	*50-32-8*	8270C	5	0.47
Benzo(b)fluoranthene	*205-99-2*	8270C	5	0.34
Benzo(g,h,i)perylene	*191-24-2*	8270C	5	0.35
Benzo(k)fluoranthene	*207-08-9*	8270C	5	0.73
Benzyl alcohol	*100-51-6*	8270C	20	0.44
bis(2-Chloroethoxy)methane	*111-91-1*	8270C	5	0.35
bis(2-Chloroethyl)ether	*111-44-4*	8270C	5	0.40
2,2'-oxybis(1-chloropropane), bis(2-chloroisopropyl)ether	*108-60-1*	8270C	5	0.52
bis(2-Ethylhexyl)phthalate	*117-81-7*	8270C	5	1.80
Butyl benzyl phthalate	*85-68-7*	8270C	5	0.42
4-Bromophenyl phenyl ether	*101-55-3*	8270C	5	0.45
4-Chloroaniline	*106-47-8*	8270C	5	0.59
4-Chloro-3-methylphenol	*59-50-7*	8270C	5	0.45
2-Chloronaphthalene	*91-58-7*	8270C	5	0.46
2-Chlorophenol	*95-57-8*	8270C	5	0.53
4-Chlorophenyl-phenylether	*7005-72-3*	8270C	5	0.35
Chrysene	*218-01-9*	8270C	5	0.33
Dibenzo(a,h)anthracene	*53-70-3*	8270C	5	0.42
Dibenzofuran	*132-64-9*	8270C	10	0.51
3,3'-Dichlorobenzidine	*91-94-1*	8270C	5	0.40
2,4-Dichlorophenol	*120-83-2*	8270C	5	0.51
1,2-Dichlorobenzene	*95-50-1*	8270C	10	0.40
1,3-Dichlorobenzene	*541-73-1*	8270C	10	0.48
1,4-Dichlorobenzene	*106-46-7*	8270C	10	0.46
Diethyl phthalate	*84-66-2*	8270C	5	0.22
2,4-Dimethylphenol	*105-67-9*	8270C	5	0.50
Dimethyl phthalate	*131-11-3*	8270C	5	0.36
Di-n-butyl phthalate	*84-74-2*	8270C	5	0.31
Di-n-octyl phthalate	*117-84-0*	8270C	5	0.47
4,6-Dinitro-2-methylphenol	*534-52-1*	8270C	10	2.20
2,4-Dinitrophenol	*51-28-5*	8270C	10	2.22
2,4-Dinitrotoluene	*121-14-2*	8270C	5	0.45

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2

CONSTITUENTS OF CONCERN
FOR GROUNDWATER

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TCL Semi-Volatile Organic Compounds (full list): (69 compounds) (ug/L) [includes Base-Neutrals (black) and Acid Extractables (blue)]				
2,6-Dinitrotoluene	*606-20-2*	8270C	5	0.40
Fluoranthene	*206-44-0*	8270C	5	0.40
Fluorene	*86-73-7*	8270C	5	0.36
Hexachlorobenzene	*118-74-1*	8270C	5	0.51
Hexachlorobutadiene	*87-68-3*	8270C	5	0.68
Hexachlorocyclopentadiene	*77-47-4*	8270C	5	0.59
Hexachloroethane	*67-72-1*	8270C	5	0.59
Indeno(1,2,3-cd)pyrene	*193-39-5*	8270C	5	0.47
Isophorone	*78-59-1*	8270C	5	0.43
2-Methylnaphthalene	*91-57-6*	8270C	5	0.60
2-Methylphenol (o-Cresol)	*95-48-7*	8270C	5	0.40
4-Methylphenol (p-Cresol)	*106-44-5*	8270C	10	0.36
Naphthalene	*91-20-3*	8270C	5	0.76
2-Nitroaniline	*88-74-4*	8270C	10	0.42
3-Nitroaniline	*99-09-2*	8270C	10	0.48
4-Nitroaniline	*100-01-6*	8270C	10	0.25
Nitrobenzene	*98-95-3*	8270C	5	0.29
2-Nitrophenol	*88-75-5*	8270C	5	0.48
4-Nitrophenol	*100-02-7*	8270C	10	1.52
N-Nitrosodiphenylamine	*86-30-6*	8270C	5	0.51
N-Nitroso-di-n-propylamine	*621-64-7*	8270C	5	0.54
Pentachlorophenol	*87-86-5*	8270C	10	2.20
Phenanthrene	*85-01-8*	8270C	5	0.44
Phenol	*108-95-2*	8270C	5	0.39
Pyrene	*129-00-0*	8270C	5	0.34
1,2,4-Trichlorobenzene	*120-82-1*	8270C	10	0.44
2,4,5-Trichlorophenol	*95-95-4*	8270C	5	0.48
2,4,6-Trichlorophenol	*88-06-2*	8270C	5	0.61

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TABLE 2

CONSTITUENTS OF CONCERN
FOR GROUNDWATER

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analyte[1]	CAS Number	Analytical Method [2]	PQL	MDL
TAL Metals (modified): (12 compounds) (mg/L) - [site specific metals in blue]				
Antimony	*7440-38-2*	6010B	0.02	0.007
Arsenic	*7440-38-2*	6010B	0.015	0.0055
Barium	*7440-39-3*	6010B	0.002	0.0007
Cadmium	*7440-43-9*	6010B	0.002	0.0005
Chromium	*7440-47-3*	6010B	0.004	0.001
Lead	*7439-92-1*	6010B	0.01	0.003
Mercury	*7439-97-6*	7470A	0.0002	0.00012
Nickel	*7440-02-0*	6010B	0.01	0.0013
Potassium	*7440-09-7*	6010B	0.5	0.1
Selenium	*7782-49-2*	6010B	0.025	0.0087
Silver	*7440-22-4*	6010B	0.006	0.0017
Thallium	*7440-28-0*	6010B	0.02	0.0102
Field Parameters: (5 compounds) (units as identified below)				
pH (units)	*NA*	field	NA	NA
Temperature (^{o}C)	*NA*	field	NA	NA
Specific Conductance (uS/mS)	*NA*	field	NA	NA
Turbidity (NTU)	*NA*	field	NA	NA
Dissolved Oxygen	*NA*	field	NA	NA

Notes:

1. Analytes as per NYSDEC and USEPA list of parameters.
2. Analytical methods per USEPA publication, SW-846, "Test Methods for Evaluating Solid Waste", 3rd Ed.

Acronyms/Abbreviations:

CAS = Chemical Abstracts Service registry number.
MDL = Method Detection Limit provided by STL
mg/L = milligrams per liter
mS = milli-Siemans
ug/L = micrograms per liter
uS = micro-Siemans
NA = not applicable
NTU = nephelometric turbidity unit
PQL = Practical Quantitation Limit

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TABLE 3

PROJECT GOALS FOR PRECISION, ACCURACY & COMPLETENESS FOR LABORATORY MEASUREMENTS

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Analytical Method	Precision Goal [1] (RPD) [2]	Accuracy Goal (% R) [3]		Completeness Goal (%)
	Soil & Water	Soil	Water	
EPA 8260B	± 30	± 50	± 30	90
EPA 8270C	± 30	± 50	± 30	90
EPA 6010B and EPA 7470A/7471A	± 30	± 50	± 30	90
EPA 8151A	± 30	± 50	± 30	90
Water Quality Parameters	± 30	NA	± 30	90

Notes:

1. Precision goals vary depending on the compound being analyzed; the precision goals presented are general in nature.
2. RPD = Relative Percent Difference
3. %R = Percent Recovery

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TABLE 4

PROJECT GOALS FOR PRECISION, ACCURACY & COMPLETENESS FOR FIELD MEASUREMENTS

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Measurement	Units	Precision Goal	Accuracy Goal	Completeness Goal
pH	pH units	± 0.2 unit	± 0.2 unit	90%
Eh	milli-volts (mV)	± 1.0 mV	± 1.0 mV	90%
Temperature	degrees Celsius (^{o}C)	± 0.2 deg. C	± 0.4 deg. C	90%
Turbidity	NTU	± 0.05 NTU	± 0.05 NTU	90%
Specific Conductance	mS/cm at 25^{o}C mS/cm at 25oC	± 100 uS/cm ± 0.1 mS/cm	± 100 uS/cm ± 0.1 mS/cm	90%
Dissolved Oxygen	ppm	± 0.3 ppm	± 0.3 ppm	90%
Water Level	fbTOR	± 0.01 unit	± 0.01 unit	90%

Acronyms/Abbreviations:

fbTOR = feet below top of riser
mS = milli-Siemans
NTU = nephelometric turbidity unit
ug/L = micrograms per liter

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TABLE 5

DATA MEASUREMENT UNITS FOR FIELD & LABORATORY PARAMETERS

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Parameter	Units
Water Level	feet below top of riser (fbTOR)
pH	pH units
Eh	milli-volts (mV)
Temperature	degrees Celsius (^{o}C)
Turbidity	Nephelometric Turbidity Unit (NTU)
Specific Conductance	microsiemens per centimeter at 25^{o}C (mS/cm) millisiemens per centimeter at 25^{o}C (mS/cm)
Dissolved Oxygen (DO)	parts per million (ppm)
Concentration of parameter in soil sample	micrograms per kilogram (mg/kg) organic milligrams per kilogram (mg/kg) inorganic
Concentration of parameter in groundwater sample	micrograms per liter (mg/L) organic milligrams per liter (mg/L) inorganic
Hydraulic Conductivity	centimeters per second (cm/sec)
Photoionization Detector (PID)	parts per million by volume (ppmv)

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TABLE 6

SAMPLE CONTAINER, VOLUME, PRESERVATION & HOLDING TIME REQUIREMENTS

QAPP
275 FRANKLIN STREET & 432 PEARL STREET SITES
BUFFALO, NEW YORK

Matrix	Parameter [1]	Container Type	Minimum Volume	Preservation (Cool to 4 °C for all samples)	Holding Time
Soil/Fill	TCL VOCs	Encore/Terracore	5 grams	Cool to 4°C, Zero Headspace	Analyze within 14 days of date of collection
Sub-Grade Vapors	TCL VOCs	Summa Cannister	6 liters	None	Analyze within 14 days of sample date of collection
Groundwater	TCL VOCs	glass vial	2-40 ml	HCl to pH<2, Zero Headspace	Analyze within 14 days of date of collection
	Sulfate	Plastic/glass	4 oz.	Cool to 4°C	28 days
	Dissolved & Total Mn, Fe	Plastic/glass	8 oz.	HNO_3 to pH<2	6 months
	COD, Nitrate	Plastic/glass	16 oz.	Cool to 4°C, H_2SO_4 to pH<2	28 days

Notes:

1. NYSDEC ASP, CLP Methodology, 2000. The list of analytes, laboratory method and the method detection limit for each parameter are included in Tables 1 and 2.

Acronyms:

VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
TAL = Target Analyte List
TCL = Target Compound List
COD = Chemical Oxygen Demand
VTSR = Validated Time of Sample Receipt; required within 2 days of collection