REMEDIAL INVESTIGATION REPORT

for

215 NORTH 10TH STREET
BROOKLYN, NEW YORK

NYSDEC BCP NO.: C224229

Prepared For:

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Langan Project No. 170482201

LANGAN

CERTIFICATION

I, Jason J. Hayes, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

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10/1/2018

Jason J. Hayes, P.E.

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AWQS	Ambient Water Quality Standards and Guidance Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
Bgs	Below grade surface
BTEX	Benzene, Toluene, Ethlylbenzene, and Xylenes
CAMP	Community Air Monitoring Program
COC	Contaminant of Concern
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
DUSR	Data Usability Summary Report
EDR	Environmental Data Resources
ELAP	Environmental Laboratory Approval Program
EPA	United Stated Environmental Protection Agency
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
FWRIA	Fish and Wildlife Resources Impact Analysis
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
ID	Inside Diameter
IDW	Investigation Derived Waste
IRM	Interim Remedial Measure
IRMWP	Interim Remedial Measure Work Plan
LNAPL	Light Non-Aqueous Phase Liquid
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTBE	Methyl tert butyl ether
NAVD88	North American Vertical Datum of 1988
NYCRR	New York City Rules and Regulations
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation
NTU	Nephelometric Turbidity Units
OD	Outside Diameter
ORP	Oxidation-Reduction Potential
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PID	Photoionization Detector
PPE	Personal Protective Equipment

Acronym	Definition
Ppm	Parts per million
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RURR	Restricted Use Restricted-Residential Use
SCO	Soil Cleanup Objective
SMDS	Sub-Membrane Depressurization System
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOGS	Technical and Operational Guidance Series
UN/DOT	United Nations/Department of Transportation
USGS	United States Geological Survey
UST	Underground Storage Tank
UU	Unrestricted Use
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Remedial Investigation Report (RIR) was prepared on behalf of 215 N 10 Partner LLC (the Volunteer) for the property located at 215 North 10th Street in the Williamsburg neighborhood of Brooklyn, New York (the "site"). The Volunteer entered into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) to remediate the site in conjunction with new development, pursuant to a Brownfield Cleanup Agreement (BCA), dated February 23, 2018, for Site No. C224229. The site is also listed with an 'E' designation (E-138) for hazardous materials, resulting from a City Environmental Quality Review (CEQR) during the May 2005 Greenpoint-Williamsburg rezoning (CEQR #04DCP003K). Satisfaction of the 'E'-Designation requirements is subject to review and approval by the New York City Mayor's Office of Environmental Remediation (NYCOER).

This RIR presents environmental data and findings from a remedial investigation (RI) that was implemented by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology D.P.C. (Langan) between November 20 and 29, 2017. The objective of the RI was to supplement existing environmental data and determine, to the extent possible, the nature and extent of contamination in soil, soil vapor, and groundwater. Information presented in this RIR will be used to evaluate appropriate remedial action alternatives.

2.0 SITE PHYSICAL CHARACTERISTICS

2.1 Site Description

The 18,000-square-foot site is located at 215 North 10th Street in the Williamsburg neighborhood of Brooklyn, New York and is identified as Brooklyn Borough Tax Map Block 2299, Lot 21. The site is improved with two single-story industrial buildings and two one-story structures, all of which are vacant. The exterior portions contain an asphalt-paved alley on the west and vegetation-covered areas on the east that were formerly used for parking. The site is bounded by North 10th Street to the south, Roebling Street to the east, and a multi-story residential apartment building to the north that wraps around to the west. A Site Location Map and Site Plan are provided as Figure 1 and Figure 2, respectively.

2.1.1 Description of Surrounding Properties

The site is located in an urban area primarily characterized by residential, commercial, and light industrial properties. Surrounding property usage is summarized in the following table:

Direction	Block	Lot	Adjoining Properties	Surrounding Properties
North	2299	9	Warehouse 11 Condominium (214 North 11th Street)	Multiple-story mixed-use residential and commercial buildings
		1	Finailly Inc. Fushimi, NYC Pet, Apartments (475 Driggs Street)	
South	2307	1	250 N 10th Apartments (250 N 10th Street)	Multiple-story residential building
East	2300	1	Roebling View North (15 Roebling Street)	Multiple-story residential building
West	2306	8	Trans Boro Fuel Oil Co.	Mixed-use commercial, residential and industrial buildings
		9	Montrose Equipment Sales (202 North 10th Street)	
		15	The Driggs North (220 N 10th Street)	
		18	Under Construction (28 Roebling Street)	

Land use within a half mile of the site is urbanized and includes mixed-use buildings, subway tunnels, park land, and school facilities. The nearest ecological receptor is the East River, located about 3,000 feet west of the site. Sensitive receptors located within a half-mile of the site are listed in the following table:

Number	Name (Approximate distance from Site)	Address
1	Northside Catholic Academy St. Vincent (approximately 0.2 miles southwest)	10 Wither Street Brooklyn, NY 11211
2	Williamsburg High School for Architecture and Design (approximately 0.3 miles south)	257 North 6th Street Brooklyn, NY 11211
3	Conselyea Preparatory School (approximately 0.3 miles south)	208 North 5th Street Brooklyn, NY 11211
4	PS 17 Henry D. Woodworth (approximately 0.3 miles south)	208 North 5th Street Brooklyn, NY 11211

Number	Name (Approximate distance from Site)	Address
5	Williamsburg Northside Preschool (approximately 0.3 miles south)	152 North 5th Street Brooklyn, NY 11211
6	Automotive High School (approximately 0.4 miles north)	50 Bedford Avenue Brooklyn, NY 11211
7	Brooklyn Preparatory High School (approximately 0.4 miles south)	257 North 6th Street Brooklyn, NY 11122
8	P.S. 132 The Conselyea School (approximately 0.45 miles southeast)	320 Manhattan Avenue Brooklyn, NY 11211
9	School Settlement Association (approximately 0.5 miles east)	120 Jackson Street Brooklyn, NY 11211

A map showing the surrounding land uses with descriptions of the adjoining properties is included as Figure 3.

2.1.2 Topography

According to a United States Geological Survey (USGS) 7.5 minute Topographic Quadrangle Map for Brooklyn, NY, the site elevation ranges from about 7.75 to 9 feet as referenced to the North American Vertical Datum of 1988 (NAVD88) and gradually slopes downward to the east.

2.1.3 Surface Water and Drainage

The eastern portion of the site has a limited area of pervious soil and overgrown vegetation, which allows for rainwater infiltration during storm events. The central and western portions of the site are improved with either buildings or asphalt lots. Runoff from this area typically drains through stormwater connections or catch basins into city sewers.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panels 3604970202F and 3604970204F, dated 5 September 2007 show that the site is in Zone AE with a base flood el 10 feet NGVD29 (about el 8.9 feet NAVD88). Zone AE is defined as a special flood hazard area and is subject to inundation by the 1 percent annual chance flood.

2.1.4 Wetlands

Potential wetlands on or near the site were evaluated by reviewing the National Wetlands Inventory and NYSDEC regulated wetlands. There are no mapped wetlands located on or near the site.

2.2 Geology and Hydrogeology

2.2.1 Regional and Site Geology

The surficial geology of Brooklyn was influenced by the last glacial advance and retreat across New York City. As the glaciers advanced south, soil and rock were scraped from the surface and deposited at the limit of the ice advance as a wall of soil and rock called the *terminal moraine*. The site is north of the terminal moraine, in the *ground moraine*, which is an area of low relief where extensive till (heterogeneous mixtures of clay, silt, sand, gravel and boulders ranging widely in size and shape) typically accumulated during the advance, or retreat of the glacier.

The site is underlain by the Hartland formation bedrock consisting of granite, schist and amphibolite. Bedrock is generally over 100 feet below grade in this area of Brooklyn.

According to the preliminary site investigation conducted by Langan on October 20 2017, the subsurface strata consists of historic fill material characterized by loose, brown, medium sand with varying amounts of coarse sand, silt, fine gravel, coal, slag, glass, ceramic, coal ash, wood, brick and concrete fragments. The fill layer extended to depths ranging from about 7.5 to 11 feet below grade surface (bgs). The fill layer was underlain by native soil characterized by loose, brown, medium sand with varying amounts of silt and fine gravel, and localized soft dark grey peat.

2.2.2 Regional and Site Hydrogeology

Groundwater flow is typically topographically influenced, as shallow groundwater tends to originate in areas of topographic highs and flows toward areas of topographic lows, such as rivers, stream valleys, ponds, and wetlands. A broader, interconnected hydrogeological network often governs groundwater flow at depth or in the bedrock aquifer. Groundwater depth and flow direction are also subject to hydrogeologic and anthropogenic variables such as precipitation, evaporation, extent of vegetation cover, and coverage by impervious surfaces. Other factors influencing groundwater include depth to bedrock, the presence of artificial fill, and variability in local geology and groundwater sources or sinks. The majority of runoff drains to the city sewers, which connect to one of the several wastewater treatment plants servicing the city.

Groundwater in this part of New York City is not used as a potable water source. Potable water provided to the City of New York is derived from surface impoundments in the Croton, Catskill, and Delaware watersheds.

Based on previous investigations, groundwater depth is expected at about 6 to 7 feet bgs and appears to flow west towards the East River.

3.0 SITE BACKGROUND

3.1 Historical Site and Surrounding Properties Use

The site and surrounding area have been developed since the early 1900s and are located in an urban setting historically characterized by industrial and commercial development. Historical uses of the property have included a dry color (powdered pigment) and paint storage facility, varnish research works, chemical warehouse, office building, and a commercial bike repair. The majority of the site uses have been warehousing and storage.

Based on historical database listings, the site formerly contained three underground storage tanks (USTs). The following tanks associated with the site have been registered, removed from site, and closed:

- Tank 1 – 5,000-gallon hydrochloric acid UST (closed in 1992)
- Tank 2 – 12,000-gallon ammonium hydroxide UST (closed in 1992)
- Tank 3 – 2,000-gallon nitric acid UST (closed in 1991)

The 1942 Sanborn Map identified one benzene tank and two gasoline tanks on site. There is inconsistent reporting throughout the previous reports regarding the number of tanks and their contents; however, no documentation regarding the current status of these tanks was available for review.

NYSDEC Spill No. 1505078 was reported on August 11, 2015, when an unknown quantity of petroleum was identified in a centrally-located monitoring well during Environmental Business Consultants' (EBC) Phase II Environmental Site Investigation. The NYSDEC closed the spill on September 21, 2015.

Adjoining properties were historically used for residential, commercial, and industrial operations. Historical uses of the site and surrounding properties are shown in Figure 4.

3.2 Proposed Redevelopment Plan

The proposed development plan consists of a seven-story mixed-use commercial and residential building with cellar-level parking, ground-level retail space, and an elevated rear yard in the northwest part of the second floor. The proposed end-use of the development is consistent with existing zoning regulations. As currently conceived, the building would cover the entire 18,000-square-foot lot and would require excavation to about 18.5 feet bgs for construction of the building foundation. Support of excavation and dewatering are anticipated to facilitate construction of foundation elements. Remediation would occur prior to and concurrently with redevelopment and would be completed in accordance with an approved Remedial Action Work Plan (RAWP) and site-specific Construction Health and Safety Plan (CHASP).

3.3 Previous Environmental Reports

Environmental reports prepared for the site include the following:

- 2015 Phase I Environmental Site Assessment Screening, prepared by EBC
- July 23, 2015 Phase II Subsurface Investigation Data Summary, prepared by EBC
- February 8, 2017 Remedial Investigation Work Plan, prepared by EBC
- October 20, 2017 Preliminary Site Investigation, performed by Langan

Reports are summarized below and available reports are included in Appendix A.

July 23, 2015 Phase II Subsurface Investigation Data Summary, prepared by EBC

The Phase II was completed in July 2015 and consisted of the following:

- A ground-penetrating radar (GPR) survey
- Advancement and sampling of 11 soil borings
- Collection of 4 groundwater samples
- Collection of 6 soil vapor samples

The Phase II findings and conclusions are as follows:

- GPR survey: A GPR survey was conducted in the suspect tank areas identified on the 1942 Sanborn Maps (south-western portion of the site) and in the proposed rear yard areas (northern portion of the site). No anomalies associated with tanks were observed.

- Soil: Trichloroethene (TCE) and tetrachloroethene (PCE) were identified in shallow and deep borings above Unrestricted Use (UU) and Restricted Use Restricted-Residential (RURR) Soil Cleanup Objectives (SCOs) with maximum concentrations of 220 milligrams per kilogram (mg/kg) and 9.4 mg/kg, respectively. SVOCS, including benzo(a)anthracene, benzo(a)pyrene, and chrysene (maximum concentrations ranging from 5 to 6.2 mg/kg), were detected above RURR SCOs primarily in shallow soils, and two deep soil locations on the east side of the site. Concentrations of arsenic (max 234 mg/kg), lead (max 8,530 mg/kg), and mercury (max 28.8 mg/kg) were detected above RURR SCOs across the site in shallow and deep soil intervals.

- Groundwater: Groundwater was encountered about 6 to 7 feet bgs and was identified to flow toward the west. TCE, cis-1,2-dichloroethene, and vinyl chloride were detected in groundwater within the central and northeast portions of the site above NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA drinking water at maximum concentrations of 240 micrograms per liter (µg/L), 30 µg/L, and 15 µg/L, respectively. A black liquid, most closely resembling No. 6 fuel oil, was identified while groundwater sampling at monitoring well MW03, located in the central part of the site. The sample from MW03 contained naphthalene above TOGS Class GA SGVs at a maximum concentration of 31 µg/L.

- Soil Vapor: TCE (up to 243,000 micrograms per cubic meter [µg/m^3]), PCE (up to 7,730 µg/m^3), carbon tetrachloride (up to 6,350 µg/m^3), and 1,1,1-trichloroethane (up to 6,000 µg/m^3) were detected in soil vapor samples collected from about 6 feet below sidewalk grade.

August 2015 Phase I Environmental Site Assessment (ESA) Screening, prepared by EBC

The Phase I ESA report identified the following Recognized Environmental Conditions (REC) for the site:

- The site was used for manufacturing and industrial operations, including the following:
  - A dry color (powdered pigment) and paint storage facility circa 1905 to 1916.
  - A varnish research works (1942 and 1951), which is associated with the use of chlorinated solvents that have potential for release to the environment.
  - A chemical warehouse until at least 1965 when it is then described as an office.
- The 1942 Sanborn Map identified one benzene tank and two gasoline tanks on site. There is inconsistent reporting throughout the text regarding the number of tanks and their contents; however, no documentation regarding the current status of these tanks, or documentation regarding soil and groundwater quality was identified during this assessment.

Although not identified as RECs in the report text, the following concerns were also identified.

- Based on database listings, the site formerly contained three USTs:
  - Tank 1 – 5,000-gallon hydrochloric acid UST (closed in 1992)
  - Tank 2 – 12,000-gallon ammonium hydroxide UST (closed in 1992)
  - Tank 3 – 2,000-gallon nitric acid UST (closed in 1991)
- The site is listed with an E-designation (E-138) for Hazardous Materials following the May 2005 Greenpoint-Williamsburg Contextual Rezoning action (CEQR #04DCP003K).

February 8, 2017 Remedial Investigation Work Plan, prepared by EBC

A Remedial Investigation Work Plan (RIWP) was prepared for Atlas Alley LLC on February 8, 2017 under the NYS BCP and approved by NYSDEC on May 1, 2017. The Volunteer for BCP Site No C224229 implemented the approved RIWP, which consisted of the following:

- Installation of 11 soil borings to about 15 feet bgs to delineate the extent of soil impacts and to obtain information on soil quality with respect to Track 1 UU SCOs; and

- Installation of 3 groundwater monitoring wells to about 15 feet bgs and sampling from two existing wells (MW3 and MW4) to assess groundwater quality and to delineate the extent of previously detected VOCs, SVOCs, and metals concentrations.

October 20, 2017 Preliminary Site Investigation, performed by Langan

A Preliminary Site Investigation was completed in October 2017 to support conceptual design of the future building. Five soil borings were advanced up to 20 feet bgs and two soil samples were collected from each boring. The Preliminary Site Investigation findings and conclusions are as follows:

- Historic fill was identified to depths between 8 and 11 feet bgs. Sand, peat, and organic clay were identified underlying the historic fill. Petroleum-like contamination (i.e., staining, sheen, odor, and photoionization detector [PID] measurements above background) was observed at LB01, which is in proximity to MW03 where No. 6 fuel oil was reportedly identified during EBC's 2015 Phase II.
- TCE, benzene, cis-1,2-dichloroethene and methylene chloride were identified in soil borings above UU SCOs with maximum concentrations of 7.1 mg/kg, 0.78 mg/kg, 9.37 mg/kg and 0.16 mg/kg, respectively. SVOCS, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene (up to 3.7 mg/kg) were detected above RURR SCOs across the site. Concentrations of arsenic (max 55 mg/kg), lead (max 752 mg/kg), and mercury (max 1.4 mg/kg) were detected above RURR SCOs. Soil boring LB05, located in the south-central portion of the site, contained petroleum-related VOCs at concentrations above UU SCOs. In general, target compounds were detected above RURR SCOs at depths up to 12 feet bgs throughout the site.

A separate report was not prepared for the October 2017 site investigation and the findings and results are discussed in this RIR.

3.4 Areas of Concern for Investigation

The following areas of concern (AOCs) represent portions of the site that required further investigation and were developed based on site observations, the site development history, and the findings of the previous environmental reports. The AOCs that were investigated include the following:

1. AOC 1 – Historic Fill: AOC 1 represent a layer of historic fill of unknown origin identified between ground surface to about 11 feet bgs. According to EBC's Phase II and Langan's Preliminary Site Investigation, historic fill is generally characterized as loose, brown, medium sand with varying amounts of black gravel, coal, slag, glass, wood, organics, red and brown clay, black to brown silt, and brick and concrete fragments. Contaminants associated with historic fill were identified in surface soil samples, including concentrations of SVOCs and metals above UU and RURR SCOs.

2. AOC 2 –Petroleum-Related Impacts in Soil and Groundwater: EBC's Phase II ESI identified petroleum-related impacts to soil, groundwater, and soil vapor, concentrated around the east-central portion of the site. Petroleum-related VOCs, including BTEX[1], naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethlybenzene, were identified in soil and groundwater. During the EBC Phase II ESI, a black liquid was encountered in monitoring well MW3. EBC collected a sample for identification and determined the liquid most closely resembled No. 6 fuel oil. Impacts are potentially associated with historic site use or off-site sources migrating onto the site.

3. AOC 3 – Chlorinated VOCs (CVOC) in Soil, Groundwater, and Soil Vapor: CVOC impacts have been detected in soil, groundwater, and soil vapor at concentrations exceeding UU and RURR SCOs. Soil impacts were identified between about 5 and 12 feet bgs in nine of the eleven previous borings, primarily within the east-central portion of the site. Two groundwater samples collected from the east-central portion of the site contained CVOCs at concentrations up to one to two orders of magnitude above their respective TOGS Class GA SGVs. Total CVOC concentrations in soil vapor ranged from 858.74 $\mu g/m^3$ in sample SG-6 to 263,934 $\mu g/m^3$ in sample SG-4. Impacts are potentially associated with historic site use or historic and current use of the surrounding properties.

4. AOC 4 – Potential Underground Storage Tank (UST): AOC 4 represents the locations of potential USTs in the western portion of the site that were identified on the 1942 Sanborn Map; the tanks were no longer shown on the subsequent 1951 Sanborn Map. One soil and one groundwater sample were collected in the vicinity of the suspected USTs during EBC's Phase II ESI and the analytical results identified the presence of petroleum-related compounds in both media.

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[1] BTEX: A group of petroleum-related compounds consisting of benzene, toluene, ethylbenzene and total xylenes.

4.0 FIELD INVESTIGATION

The purpose of the RI was to further delineate the nature and extent of impacts in accordance with DER-10-3.1 to formulate a conceptual site model and an effective strategy for site remediation. The Volunteer implemented the NYSDEC-approved RIWP between November 20 and 29, 2017 in accordance with Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 375, the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (May 2010), and the NYSDEC Draft BCP Guide (May 2004). A photograph log documenting this investigation is included as Appendix B.

The RI consisted of the following:

- Geophysical survey to identify subsurface anomalies consistent with utilities, substructures, physical obstructions, and USTs, and to pre-clear soil boring locations;
- Advancement of 12 soil borings (16B1 through 16B12), and collection of 35 soil samples, including two field duplicates, and two matrix spike/matrix spike duplicate (MS/MSD) quality assurance/quality control (QA/QC) samples;
- Installation of 3 groundwater monitoring wells and collection of 7 groundwater samples from two existing monitoring wells and three newly installed wells, including one duplicate and one MS/MSD QA/QC samples;
- Implementation of a Community Air Monitoring Program (CAMP); and
- Survey of site monitoring wells for location and elevation relative to NAVD88.

A summary of the samples is provided as Table 1. Sample locations are shown on Figure 5. Each component of the RI is further described in the following sections.

4.1 Utility Mark-out

Prior to beginning of the field investigation, the New York One Call Center was contacted for Code 753 utility mark-outs.

4.2 Geophysical Investigation

A geophysical investigation was implemented by NOVA Geophysical & Environmental, Inc. of Douglaston, New York. The survey used ground-penetrating radar (GPR) to identify potential USTs and locate buried utilities and substructures in the vicinity of each boring location. Borings were relocated as necessary to avoid subsurface utilities and other subsurface impediments. A copy of the geophysical survey report is included in Appendix C.

4.3 Soil Investigation

4.3.1 Investigation Methodology

A total of 12 soil borings (16B1 through 16B12) were advanced by AARCO Environmental Services Corp. (AARCO) between November 20 and 21, 2017. Boring locations were selected to provide sufficient site coverage and to evaluate the AOCs listed in Section 3.4. A direct-push Geoprobe® 6610 DT was used to advance borings to 12 to 15 feet bgs, as summarized below:

- Borings 16B1, 16B2, 16B3 and 16B8 were advanced to about 15 feet bgs to characterize deeper soil which was not previously sampled;
- Borings 16B4, 16B5, and 16B6 were advanced to about 15 feet bgs to further characterize petroleum and chlorinated VOC contamination;
- Boring 16B7 was advanced to about 15 feet bgs to characterize deeper soil in the former benzene UST and gasoline UST area;
- Borings 16B9 through 16B11 were advanced to about 12 feet bgs to characterize non-aqueous phase liquid (NAPL) previously observed in MW3; and
- Boring 16B12 was advanced to about 12 feet bgs to characterize the extent of petroleum-related impacts.

Soil samples were collected continuously from surface grade to the final depth of each environmental boring into 4-foot-long Macro-Core® samplers equipped with acetate liners. Recovered soil was screened for visual, olfactory, and instrumental evidence of environmental impacts and was visually classified for soil type, grain size, color, texture, and moisture content. Instrument screening for the presence of VOCs was performed with a PID equipped with a 10.6 electron volt (eV) lamp. Boring logs documenting these observations are included in Appendix D. Following sample collection, all borings were backfilled with clean soil cuttings.

4.3.2 Sampling Methodology

A total of 35 soil samples (including QA/QC samples) were collected for laboratory analysis in general accordance with the RIWP. Soil sample collection was generally biased toward the intervals with the greatest evidence of environmental impacts (i.e., PID readings above background, staining, chemical/petroleum-like odors). One to four samples were collected at each boring (except for 16B12) to evaluate the AOCs discussed in section 3.4. The table below identifies the borings associated with each AOC.

AOC	Associated Soil Boring
AOC 1 – Historic Fill	16B1 through 16B11
AOC 2 – Petroleum-Related Impacts	16B9, 16B10, 16B11, 16B12
AOC 3 – Chlorinated Solvents	16B4, 16B5, 16B6
AOC 4 – Potential USTs	16B7

Grab samples submitted for VOC analysis were collected directly from the Geoprobe® acetate liner via laboratory-supplied Terra Core® soil sample kits. The sample containers were labeled, placed in a laboratory-supplied cooler, and packed with ice (to maintain a temperature of 4

±2°C). The samples were relinquished, under standard chain-of-custody protocol, to a courier for delivery to Alpha Analytical Laboratories (Alpha), a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory in Westborough, Massachusetts.

Soil samples collected from soil borings 16B1 through 16B8 were analyzed for Target Compound List (TCL)/NYSDEC Part 375 List VOCs + tentatively identified compounds (TICs) by United States Environmental Protection Agency (EPA) Method 8260C, TCL/Part 375 SVOCs + TICs by EPA Method 8270D, and TAL/Part 375 metals by EPA Method 6010C. Samples collected from soil borings 16B9 through 16B11 were analyzed for Total Extractable Petroleum Hydrocarbons (EPH) and Part 375/Priority Pollutants Plus 40 (VOCs, SVOCs, pesticides, herbicides, polychlorinated biphenyls [PCBs], and metals). A sample analysis summary is provided as Table 1.

4.4 Groundwater Investigation

Groundwater monitoring wells were installed and sampled to characterize groundwater conditions and to investigate potential impacts to groundwater associated with the identified AOCs.

4.4.1 Monitoring Well Installation and Development

Three locations in the southeastern corner were drilled to 15 feet bgs and converted into groundwater monitoring wells. The wells were installed with 1-inch diameter schedule 40 pre-pack well screens set to straddle the groundwater table. The screens were set between 5 to 15 feet bgs and solid PVC risers were installed above the screens to extend the well to grade. The annulus of each well was filled with No. 2 sand to about 1 foot above the top of the screen. Hydrated bentonite well seals were installed above the filter sand. Following installation, each well was developed by purging at least 3 well volumes with a check valve. Purged groundwater was stored in one labeled 55-gallon drum and staged on-site pending disposal. The top of casing for each monitoring well was surveyed by Langan on December 29, 2017. Monitoring well construction details are presented in Table 2 and well construction logs are included in Appendix E.

4.4.2 Groundwater Sampling

Monitoring wells were sampled one week after development in accordance with the EPA's low-flow groundwater sampling procedure to allow for collection of a representative sample ("Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells," EQASOP-GW 001, January 19, 2010). Prior to sample collection, synoptic water level and total volatile headspace measurements were collected from RIWP monitoring wells on November 29, 2017. Groundwater elevations are presented in Table 3. A groundwater contour map is presented as Figure 7.

Following the gauging event, groundwater was purged from each well until groundwater parameters (pH, conductivity, turbidity, dissolved oxygen (DO), temperature, turbidity, and oxidation-reduction potential [ORP]) had stabilized. At least three well casing volumes were purged from each well before samples were collected using a peristaltic pump and dedicated polyethylene tubing.

Seven groundwater samples were collected (one from each of the three newly installed wells [16MW1, 16MW2, and 16MW3], one from existing wells MW3 and MW4, plus one duplicate, and one MS/MSD). Samples were collected into laboratory-supplied glassware and delivered via courier service to Alpha for analysis of TCL/Part 375 VOCs + TICS by EPA Method 8260C, TCL/Part 375 SVOCs + TICS by EPA method 8270D, and TAL/Part 375 metals (total and dissolved) by EPA methods 6010C. Groundwater sampling logs are included in Appendix E.

4.5 Quality Assurance/Quality Control Sampling

Trip blanks, field duplicate samples, and MS/MSD samples were collected and submitted for laboratory analysis for QA/QC purposes; these samples are detailed in Table 1. Matrix-specific QA/QC samples that were collected for the RI are summarized below:

Soil QA/QC Samples

- Two field duplicate samples;
- Two MS/MSD samples; and
- Three trip blanks.

Groundwater QA/QC Samples

- One field duplicate samples;
- One MS/MSD samples; and
- One trip blank.

MS/MSD samples were collected to assess the effect of the sample matrix on the recovery of target compounds or target analytes.

Field duplicate samples were collected to assess the precision of the analytical methods relative to the sample matrix. The duplicates were collected from the same material as the primary sample by splitting the volume of homogenized sample collected in the field into two sample containers.

Trip blank samples were collected to assess the potential for contamination of the sample containers and samples during transport from the laboratory, to the field, and back to the laboratory for analysis. Trip blanks contain about 40 milliliters of acidic water (doped with hydrochloric acid) that is prepared and sealed by the laboratory when the empty sample containers are shipped to the field, and then unsealed and analyzed for VOCs by the laboratory when the sample shipment is received from the field.

4.6 Data Validation

Analytical data was validated by a Langan validator in accordance with EPA and NYSDEC validation protocols. Copies of the data usability summary reports (DUSRs) and the data validator's credentials are provided in Appendix G.

4.6.1 Data Usability Summary Report Preparation

A DUSR was prepared for each sampling matrix. The DUSR presents 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. For the soil and groundwater samples, the following items were assessed:

- Hold times
- Sample preservation
- Sample extraction and digestion
- Laboratory blanks
- Laboratory control samples
- System monitoring compounds
- MS/MSD recoveries
- Field duplicate, trip blank, and field blank sample results

Based on the results of data validation, the following qualifiers may be assigned to the data in accordance with the EPA's guidelines and best professional judgment:

- "U" – The analyte was analyzed for but was not detected at a level greater than or equal to the reporting limit (RL) or the sample concentration or the sample concentration for results impacted by blank contamination.
- "UJ" – The analyte was not detected at a level greater than or equal to the RL; however, the reported RL is approximate and may be inaccurate or imprecise.
- "J" – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
- "R" – The sample results are not useable due to quality of the data generated because certain criteria were not met. The analyte may and may not be present in the sample.

After data validation activities were complete, validated data was used to prepare the tables and figures included in this report.

4.7 Field Equipment Decontamination

Down-hole drilling equipment was decontaminated between each boring. Down-hole drilling equipment was rinsed with an Alconox®-based solution. Decontamination wastewater was placed into 55-gallon drums for disposal.

4.8 Investigation-Derived Waste Management

Investigation derived waste (IDW) generated during the RI was properly handled and containerized. Groundwater from monitoring well development and purging, and decontamination water were placed into UN/DOT-approved 55-gallon steel drums with sealed tops. Drill cuttings exhibiting no evidence of chemical or petroleum impacts were used to backfill soil borings. One groundwater drum was staged in a secured area on-site pending transport by a licensed waste hauler for disposal at an approved facility.

4.9 Community Air Monitoring Program

A Community Air Monitoring Plan (CAMP) was implemented during each day of environmental drilling, on November 20 and 21, 2017. The CAMP was developed to monitor potential exposure to off-site receptors, including residences and businesses, from potential airborne contaminant releases during intrusive field activities. The CAMP consisted of real-time monitoring for VOCs and particulates (i.e., dust) at upwind and downwind locations to the works.

Instruments

Continuous dust and VOC monitoring was conducted using one upwind and one downwind monitoring station at the site perimeter. Each monitoring station included a TSI DustTrak II aerosol monitor for measuring particulates with an aerodynamic diameter less than 10 micrometers (PM10), and a MiniRAE® 3000 PID for measuring total VOCs. The work zone and site perimeter were visually monitored for fugitive dust emissions.

Action Levels

Action levels used to monitor community and visitor exposure were set forth in the CAMP included in the CHASP (Appendix D in the RAWP) and are summarized as:

- Particulate Action Level: 100 micrograms of dust per cubic meter of air (µg/m3) above background for a 15-minute average
- VOC Action Level: 25 parts per million (ppm) for instantaneous readings above background or 5 ppm above background for a 15-minute average.

Aerosol monitors and PIDs recorded measurements on a continuous basis during remediation and construction activities. Fifteen-minute running averages were calculated from the recorded data, and averages were compared to the action levels specified above. CAMP summary data is included as Appendix F.

5.0 FIELD OBSERVATIONS AND ANALYTICAL RESULTS

5.1 Geophysical Investigation Findings

The majority of identified anomalies were consistent with utilities (i.e. electric, gas, sewer line and water line). One large anomaly, consistent with a potential UST, was identified in the northwestern corner of the site. Historical records also indicate that there may be USTs in the western portion of the site. A copy of the November 2017 geophysical report is included in Appendix C.

5.2 Geology and Hydrogeology

Provided below is a description of the geologic and hydrogeologic observations made during the RI. A groundwater contour map is included as Figure 6, cross-sectional diagrams showing inferred soil profiles are shown on Figure 7, and soil boring logs are provided in Appendix D.

5.2.1 Historic Fill

The site is underlain by a layer of historic fill ranging in depth from about 6 feet bgs (16B5) to 11.5 feet bgs (16B8) and predominately consisting of brown fine- to medium-grained sand with varying amounts of gravel, brick, concrete, asphalt, silt, glass, wood, organics, coal fragments and slag. An about 1.5-foot void was encountered underneath the northern building slab during advancement of soil boring 16B2. The void was also observed in three exploratory offsets, spaced about 5 feet around the original boring location.

5.2.2 Native Soil Layers

The fill layer is underlain by olive, fine-grained silty sand and grey organic clay with varying amounts of gravel, organics, and shells. Underlying the silty sand is an interval of soft, grey clay with varying amounts of organics and shells. This stratigraphy was generally consistent across the site.

5.2.3 Bedrock

The USGS "Bedrock and Engineering Geologic Maps of New York County and Parts Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey" indicates that the bedrock underlying the site is part of the Hartland Formation. Bedrock was not encountered during this RI. A November 2017 geotechnical investigation, which included advancement of soil borings to 100 feet bgs, did not encounter bedrock.

5.2.4 Hydrogeology

Synoptic groundwater level measurements were collected on November 29, 2017 from five monitoring wells (MW3, MW4, 16MW1, 16MW2, and 16MW3), and on January 2, 2018 from seven wells (MW1, MW2, MW3, MW4, 16MW1, 16MW2, and 16MW3). Water level ranged between about el. 0.76 and el. 2.78 NAVD88. Based on the well gauging results, groundwater appears to flow west towards the East River. A map showing groundwater contours and the inferred flow direction is provided as Figure 6. Groundwater elevations are shown in Table 3.

5.3 Soil Findings

5.3.1 Field Observations

Petroleum-like impacts, evidenced by odors, staining, and/or PID readings above background levels were observed at similar depths in six of the twelve soil borings. The depth intervals at which petroleum impacts were apparent with the highest recorded PID readings are provided in the following table:

Soil Boring ID	Depth Interval of Observed Impacts (feet bgs)	Max PID Reading (ppm)	Soil Boring Location
16B1	7 to 13	103.7 (7 to 8 feet bgs)	Central
16B2	11 to 12	16.1 (11 to 12 feet	North-central
16B3	7 to 8	634.1 (7 to 8 feet bgs)	Northeast
16B7	7 to 8	388.2 (7 to 8 feet bgs)	Southwest
16B9	7 to 10.5	61.5 (10 to 11 feet	Central
16B10	7 to 8	54.6 (7 to 8 feet bgs)	Central

5.3.2 Analytical Results

A summary of laboratory detections for soil samples collected during the RI with comparisons to NYSDEC Part 375 UU SCOs and RURR SCOs is provided in Tables 4A and 4B. Laboratory analytical data reports are included in Appendix H. Soil sample results that exceed UU and RURR SCOs for samples collected during previous environmental investigation and the RI are shown on Figure 8.

The following sections present a summary of concentrations that exceeded their respective UU and/or RURR SCOs, organized by analytical parameter set:

VOCs

Petroleum-related and chlorinated VOCs were detected in soil at concentrations above 6 NYCRR Part 375 UU SCOs at depths ranging from 0 to 8 feet bgs and in localized areas up to 12 feet bgs. VOC concentrations above RURR SCOs were identified up to 8 feet bgs in three soil samples located within the northern portion of the site (16B1, 16B3, and 16B8). The table below provides a summary of low and high range VOC concentrations that were detected above their respective 6 NYCRR Part 375 UU SCOs. VOC concentrations that were also detected above RURR SCOs are shown in bold.

Parameter	Range of Concentrations Detected above SCO		UU and RURR SCOs
	Low	High	
1,2,4-Trimethylbenzene	6.2 mg/kg in 16B3_7-8	8.7 mg/kg in 16B1_7-8	UU: 3.6 mg/kg RURR: 52 mg/kg
2-Butanone	0.78 mg/kg in 16B3_0-2	1.4 mg/kg in 16B3_7-8 and 16B8_5.5-6.5	UU: 0.12 mg/kg RURR: 100 mg/kg
Acetone*	0.051 mg/kg in 16B4_11-12	0.23 mg/kg in 16B3_0-2	UU: 0.05 mg/kg RURR: 100 mg/kg
cis-1,2-Dichloroethene	0.26 mg/kg in 16B8_11-12	16 mg/kg in 16B3_7-8	UU: 0.25 mg/kg RURR:100 mg/kg
Naphthalene	13 mg/kg in 16B1_7-8		UU: 12 mg/kg RURR: 100 mg/kg
Tetrachloroethene	2.3 mg/kg in 16B8_0-2	5.7 mg/kg in 16B5_4.5-5	UU: 1.3 mg/kg RURR: 19 mg/kg
trans-1,2-Dichloroethene	1.1 mg/kg in 16B3_7-8		UU: 0.19 mg/kg RURR: 100 mg/kg
Trichloroethene	0.51 mg/kg in 16B10_7-8	**30 mg/kg** in 16B1_0-2	UU: 0.47 mg/kg RURR: 21 mg/kg
Vinyl chloride	0.57 mg/kg in 16B10_7-8	**1.6 mg/kg** in 16B3_7-8	UU: 0.02 mg/kg RURR: 0.9 mg/kg
Xylenes, Total	0.49 mg/kg in 16B8_0-2	7.2 mg/kg in 16B3_0-2	UU: 0.26 mg/kg RURR: 100 mg/kg

*Acetone is a common laboratory contaminant and therefore, its presence in soil results is not likely representative of site conditions.

SVOCs

Nine SVOCs were detected in soil at concentrations above 6 NYCRR Part 375 UU at depths ranging from 0 to 8 feet bgs throughout the site and in one location (16B8) at a depth up to 15 feet bgs. SVOCs in soil detected at concentrations above RURR SCOs were identified up to at least 8 feet bgs in borings 16B2 and 16B3, and up to 15 feet bgs in boring 16B8. The table below provides a summary of low and high range SVOC concentrations that were detected above their respective 6 NYCRR Part 375 UU SCOs. SVOC concentrations that were also detected above RURR SCOs are shown in bold.

Parameter	Range of Concentrations Detected above SCO		UU and RURR SCOs
	Low	High	
3-Methylphenol/ 4-Methylphenol	0.38 mg/kg in 16B8_11-12	2.7 mg/kg in 16B10_7-8	UU: 0.33 mg/kg RURR: 100 mg/kg
Benzo(a)anthracene	**1.2 mg/kg** in 16B1_0-2 and SODUP02_112119	**5.4 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR: 1 mg/kg
Benzo(a)pyrene	**1.1 mg/kg** in SODUP02_112117	**5.1 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR:1 mg/kg
Benzo(b)fluoranthene	**1.1 mg/kg** in 16B6_3-4 and 16B8_11-12	**6.5 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR: 1 mg/kg
Benzo(k)fluoranthene	1.3 mg/kg in 16B3_7-8	2.1 mg/kg in 16B2_7-8	UU: 0.8 mg/kg RURR: 3.9 mg/kg
Chrysene	1.2 mg/kg in 16B1_0-2, 16B1_7-8 and SODUP02_112117*	**5.3 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR: 3.9 mg/kg
Dibenzo(a,h)anthracene	**0.35 mg/kg** in 16B8_14-15	**0.69 mg/kg** in 16B2_7-8	UU: 0.33 mg/kg RURR: 0.33 mg/kg
Indeno(1,2,3-cd)pyrene	**0.51 mg/kg** in 16B3_0-2	**3.2 mg/kg** in 16B2_7-8	UU: 0.5 mg/kg RURR: 0.5 mg/kg
Phenol	0.44 mg/kg in 16B10_7-8		UU: 0.33 mg/kg RURR: 100 mg/kg

*SUDUP02_112117 is a duplicate of the parent sample 16B4_3-4.

Pesticides, Herbicides, and PCBs

Per the approved RIWP, only soil samples collected from borings 16B9 through 16B11 were analyzed for pesticides, herbicides, and PCBs. Herbicides and PCBs were not detected. One pesticide, 4,4'-DDT, was detected above 6 NYCRR UU, but below RURR SCOs in the 7- to 8-foot interval of soil boring 16B10.

A site-wide waste characterization will be completed to classify soil prior to excavation for foundation construction and will include analysis of pesticides, herbicides, and PCBs.

Metals

Metals were detected at concentrations above their respective 6 NYCRR Part 375 UU and RURR SCOs in all sampled soil borings, and extending up to 15 feet in borings 16B4 and 16B8. Borings 16B4 and 16B8 also contained metals at concentrations above Part 375 RURR SCOs up to 15 feet bgs. The highest concentrations appear to be located within the historic fill layer and generally begin to diminish with depth. The following table provides a summary of low and high range metal concentrations that were detected above their respective Part 375 UU SCOs. Metals concentrations that were also detected above RURR SCOs are shown in bold.

Parameter	Range of Concentrations Detected above SCO		UU and RURR SCOs
	Low	High	
Arsenic	19.2 mg/kg in 16B1_7-8	**117 mg/kg** in 16B9_10-11	UU: 0.33 mg/kg RURR: 100 mg/kg
Barium	370 mg/kg in SODUP02_112117*	**672 mg/kg** in 16B3_0-2	UU: 350 mg/kg RURR: 400 mg/kg
Cadmium	2.66 mg/kg in 16B2_13-14	**37.2 mg/kg** in 16B1_7-8	UU: 2.5 mg/kg RURR: 4.3 mg/kg
Chromium, Hexavalent	1.2 mg/kg in 16B9_10-11	1.5 mg/kg in SODUP01_112017 (duplicate of 16B5_12-13)	UU: 1 mg/kg RURR: 110 mg/kg
Chromium, Trivalent	34 mg/kg in 16B8_14-15	**2,400 mg/kg** in 16B7_6.5-7.5	UU: 30 mg/kg RURR:180 mg/kg
Copper	51.7 mg/kg in 16B4_3-4	**1,250 mg/kg** in 16B3_7-8	UU: 50 mg/kg RURR: 270 mg/kg
Lead	96.2 mg/kg in 16B4_11-12	**9,410 mg/kg** in 16B9_10-11	UU: 63 mg/kg RURR: 400 mg/kg
Mercury	0.45 mg/kg in 16B5_12-13	**160 mg/kg** in 16B3_7-8	UU: 0.18 mg/kg RURR: 0.81mg/kg
Nickel	32 mg/kg in 16B6_3-4	295 mg/kg in 16B1_7-8	UU: 30 mg/kg RURR: 310 mg/kg
Selenium	0.21 mg/kg in 16B8_5.5-6.5	6.7 mg/kg in 16B1_7-8	UU: 3.9 mg/kg RURR: 180 mg/kg
Silver	3.69 mg/kg in 16B8_11-12	57.8 mg/kg in 16B5_4.5-5	UU: 2 mg/kg RURR: 180 mg/kg
Zinc	126 mg/kg in 16B2_11-12	**7,990 mg/kg** in 16B2_7-8	UU: 109 mg/kg RURR: 1000 mg/kg

*SODUP02_112117 is a duplicate of the parent sample 16B4_3-4.

5.4 Groundwater Findings

5.4.1 Field Observations

All monitoring wells sampled during the RI were first gauged for the presence of free product (i.e., light, non-aqueous phase liquid (LNAPL) with an oil-water interface probe. Free product was not detected; however, petroleum-like odors were observed in purged groundwater generated from MW3. Monitoring well headspace PID measurements ranged from 0.0 to 4.8 ppm (highest reading in 16MW2) during sampling.

Existing monitoring well MW4, from EBC's Phase II ESI, was found without a cover, damaged, and covered with overgrown vegetation. After removing the surface vegetation and cave-in debris, groundwater was detected within the monitoring well.

5.4.2 Analytical Results

A summary of the groundwater sample laboratory detections compared to TOGS Class GA SGVs is presented in Tables 5. Groundwater sample locations and results that exceed their respective TOGS Class GA SGVs are presented on Figure 9. Laboratory analytical data reports are included in Appendix H.

The following is a summary of groundwater sample results from the RI that exceed the TOGS SGVs organized by analytical parameter set:

VOCs

Four VOCs were detected in groundwater at concentrations above their respective TOGS Class GA SGVs throughout the site. The following table provides low and high range concentrations of VOCs detected above their respective TOGS Class GA SGVs.

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
cis-1,2-Dichloroethene	8.6 µg/L in 16MW3	40 µg/L in MW4	5 µg/L
Naphthalene	17 µg/L in 16MW1		10 µg/L
Trichloroethene	5.5 µg/L in GWDUP01	21 µg/L in 16MW3	5 µg/L
Vinyl chloride	4 µg/L in MW4	5.1 µg/L in MW3	2 µg/L

*GWDUP01 is a duplicate of the parent sample from monitoring well 16MW2.

SVOCs

Groundwater samples collected from 16MW1, 16MW2 and 16MW3 contained one or more SVOCs at concentrations above their respective TOGS Class GA SGVs. The following table provides low and high range concentrations of SVOCs detected above their respective TOGS Class GA SGVs.

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
Benzo(a)anthracene	0.03 µg/L in 16MW1	0.45 µg/L in 16MW3	0.002 µg/L
Benzo(a)pyrene	0.41 µg/L in 16MW3		0.002 µg/L
Benzo(b)fluoranthene	0.02 µg/L in 16MW1	0.6 µg/L in 16MW3	0.002 µg/L
Benzo(k)fluoranthene	0.2 µg/L in 16MW3		0.002 µg/L
Bis(2-chloroethyl)ether	2 µg/L in MW3, MW4, 16MW1, 16MW2, and		1 µg/L

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
	16MW3		
Chrysene	0.05 µg/L in16MW2	0.48 µg/L in 16MW3	0.002 µg/L
Hexachlorocyclopentadiene	20 µg/L in MW3, MW4, 16MW1, 16MW2, and 16MW3		5 µg/L
Indeno(1,2,3-cd)pyrene	0.39 µg/L in 16MW3		0.002 µg/L

Total Metals

Eight total metals were detected in groundwater at concentrations above their respective TOGS Class GA SGVs. The following table provides low and high range concentrations of metals detected above their respective TOGS Class GA SGVs:

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
Arsenic	120.6 µg/L in MW4		25 µg/L
Iron	2,760 µg/L in 16MW1	26,100 µg/L in MW4	300 µg/L
Lead	53.44 µg/L in 16MW3	359 µg/L in GWDUP01*	25 µg/L
Manganese	346.8 µg/L in MW4	576.8 µg/L in 16MW1	300 µg/L
Mercury	7.3 µg/L in 16MW2	20.05 µg/L in GWDUP01*	0.7 µg/L
Nickel	136.9 µg/L in 16MW3		100 µg/L
Sodium	25,200 µg/L in 16MW3	69,700 µg/L in GWDUP01*	20,000 µg/L
Zinc	3,294 µg/L in 16MW3		20,000 µg/L

*GWDUP01 is a duplicate of the parent sample from monitoring well 16MW2.

Dissolved Metals

Six dissolved metals were detected in groundwater at concentrations above their respective TOGS Class GA SGVs across the site. The following table provides low and high range concentrations of dissolved metals detected above their respective TOGS Class GA SGVs:

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
Arsenic	112.1 µg/L in MW4		25 µg/L
Iron	2,830 µg/L in 16MW1	20,400 µg/L in MW4	300 µg/L

Manganese	338.2 µg/L in MW4	569.2 µg/L in 16MW1	300 µg/L
Nickel	135.6 µg/L in 16MW3		100 µg/L
Sodium	23,400 µg/L in 16MW3	62,500 µg/L in GWDUP01	20,000 µg/L
Zinc	3,236 µg/L in 16MW3		20,000 µg/L

5.5 QA/QC Sample Results

Duplicate and trip blank samples collected during the RI are detailed in Table 1 and MS/MSD sample results are summarized in the laboratory reports. Duplicate and MS/MSD samples were collected at a frequency of 1 per 20 primary samples. QA/QC samples results were also evaluated as part of data validation. Analytical results for trip blank samples are summarized in Table 7.

5.6 Data Usability

Category B laboratory reports for all the collected soil and groundwater samples were provided by Alpha and were forwarded to Langan's data validator. Copies of the DUSRs are provided in Appendix G. The results of the data validation review are summarized below.

Major deficiencies were identified include:

- 2-chloroethylvinyl ether was submitted to the laboratory as preserved; however, it is an acid-labile compound that will not recover in the presence of hydrochloric acid. The associated trip blank sample results were qualified as "R" for unusable.

With the exception of 2-chloroethylvinyl ether, the data was determined to be acceptable and usable as qualified.

5.7 Evaluation of Potential Areas of Concern

The goal of the RI was to evaluate the AOCs described in Section 3.4. This section discusses the results of the RI with respect to the AOCs.

5.7.1 AOC-1: Historic Fill

Historic fill was identified in all borings extending to depths from 6 feet bgs (16B2) to about 11.5 feet bgs (16B8). Contaminants typically associated with historic fill in soil and groundwater include SVOCs, pesticides, PCBs, and metals.

Findings Summary

Soil

Historic fill generally consisted of brown, fine to medium sand with varying amounts of gravel, brick, concrete, asphalt, silt, glass, organics, wood, coal fragments, and slag. Thirteen samples were collected from the historic fill layer. Sample results from historic fill are summarized as follows:

- VOCs (2-butanone acetone, cis-1,2,-dichloroethene, naphthalene, PCE, TCE, trans-1,2-dichloroethene, vinyl chloride and total xylenes) were detected at concentrations exceeding their respective UU and/or RURR SCOs across eight soil borings (16B1, 16B3, 16B4, 16B5, 16B6, 16B7, 16B8 and 16B10). With the exception of acetone, these detections are likely related to releases associated with the historical use of petroleum products and chlorinated solvents at the site or at surrounding sites or the general quality of the fill placed at the site. Acetone is a common laboratory contaminant and is likely not representative of the soil conditions.

- SVOCs were detected at concentrations exceeding their respective UU SCOs (3-methylphenol/4-methylphenol, benzo(k)fluoranthene, and phenol) and RURR SCOs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene) across soil borings 16B1, 16B3, 16B4, 16B5, 16B6, 16B7, 16B8 and 16B10.
- Metals were detected at concentrations exceeding their respective UU SCOs (arsenic, barium, cadmium, hexavalent and trivalent chromium, copper, lead, mercury, nickel, selenium, silver, and zinc) and RURR SCOs (arsenic, barium, cadmium, trivalent chromium, copper, lead, and mercury) across samples collected from the historic fill layer.
- The pesticide 4,4’-DDT was detected above UU SCOs in one sample (16B10_7-8).
- Total PCBs and herbicides were not detected above UU SCOs in any samples.

Groundwater

Several SVOCs were detected a concentrations above TOGS Class GA SGVs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-chloroethyl)ether chrysene, hexachlorocyclopentadiene, and indeno(1,2,3-cd)pyrene. Total and dissolved arsenic was detected at a concentration exceeding its TOGS Class GA SGV in the groundwater sample collected from MW4 (maximum of 120.6 µg/L in MW4_112917). Other detected metals, including iron, manganese, nickel, sodium and zinc, are considered naturally occurring elements.

Soil Vapor

Historic fill does not appear to have contributed to soil vapor contamination at the site.

<u>*Conclusions*</u>

Historic fill was identified across the site from surface grade to depths up to about 11.5 feet bgs. VOCs, SVOCs, and metals were detected above both UU and RURR SCOs in the historic fill. Petroleum-related and chlorinated VOCs were detected in soil samples collected from the east-central portion of the site and the detected concentrations are likely due to the historical use of petroleum products and chlorinated solvents at the site or at surrounding sites or the general quality of the fill placed at the site. Similar compounds detected in soil were also reflected in the groundwater at concentrations above TOGS Class GA SGVs.

5.7.2 AOC-2: Petroleum-Related Impacts in Soil and Groundwater

Petroleum-related impacts were detected in soil at concentrations exceeding UU and/or RURR SCOs during EBC's 2015 Phase II ESI. Similar soil conditions were identified from 0 to 8 feet in three of the eleven RI borings. Two groundwater samples from EBCs Phase II contained petroleum-related VOCs at concentrations about one to two orders of magnitude above their respective TOGS Class GA SGVs.

Findings Summary

Soil

Two petroleum-related VOCs, naphthalene and total xylenes, were detected at concentrations exceeding UU SCOs in three soil borings (16B1, 16B3, and 16B8), generally located in the central portion of the site. Several borings, including 16B1, 16B2, 16B3, and 16B7, contained elevated PID readings, staining, and petroleum-like odors. Additionally, gross impacts were observed in soil boring 16B1 consisting of product and/or stained soil with petroleum-like odors from about 7 to 13.5 feet bgs.

Groundwater

Analytical results identified petroleum-related impacts to groundwater in the central and eastern portions of the site. Naphthalene was detected above its TOGS Class GA SGV in monitoring wells MW3 and 16MW1 during EBC's 2015 Phase II ESI and Langan's 2017 RI, respectively. Sample MW3 exhibited the maximum naphthalene concentration of 31 µg/L, followed by 16MW1_11297 with a concentration of 17 µg/L.

Conclusions

Based on the analytical results and field observations, petroleum-related impacts are localized to the shallow subsurface (less than 15 feet bgs), typically around the groundwater interface and in groundwater primarily in the central and eastern portions of the site. Target compound concentrations in groundwater are highest in wells that are hydraulically up-gradient to the historical on-site USTs, suggesting that contamination is potentially due to the historical use of petroleum products at the site or from off-site sources migrating onto the site. In general, impacts were not observed to extend into the organic clay layer with the exception of soil boring 16B1. Impacts were not observed at the termination of boring 16B1 (15 feet bgs).

5.7.3 AOC-3: CVOCs in Soil, Groundwater, and Soil Vapor

CVOC impacts were detected at concentrations in soil exceeding UU and/or RURR SCOs, in groundwater exceeding TOGS Class GA SGVs, and in soil vapor above the NYSDOH Decision Matrices for recommended "mitigation" during EBC's Phase II ESI. Similar soil impacts were identified in seven of the eleven RI borings.

Findings Summary

Soil

TCE and vinyl chloride were detected in soil at concentrations exceeding RURR SCOs at borings 16B1, 16B2, and 16B8, located in the central portion of the site. TCE and cis-1,2-dichloroethene were detected at concentrations above UU SCOs in RI borings 16B3, 16B5, 16B6, 16B8, and 16B10.

Groundwater

Analytical results from the RI identified CVOC impacts to groundwater in the central and eastern portion of the site. Four of the five groundwater samples contained CVOCs at concentrations that were one to two orders of magnitude above their respective TOGS Class GA SGVs. Concentrations of TCE, cis-1,2-dichloroethene, and vinyl chloride exceeding their respective TOGS Class GA SGVs were found in samples collected from MW3, MW4, 16MW1, 16MW2 and 16MW3. Maximum RI concentrations of TCE (21μg/L) and cis-1,2-dichloroethene (40 μg/L) were detected in monitoring wells 16M3 and MW4, respectively. These compounds were also detected during EBC's Phase II ESI at 170 μg/L and 30 μg/L, respectively.

Soil Vapor

According EBC's Phase II ESI, total CVOC concentrations in soil vapor samples ranged from 206 μg/m^3 at SG-6, located in the south-central portion of the site, to 261,616 μg/m^3 at SG-4, located in the central portion of the site. Soil vapor sample locations and analytical results are shown on Figure 10.

Conclusions

Based on analytical results from previous environmental investigations and the RI, concentrations of CVOCs in soil are primarily in the historic fill layer located in the central and eastern portions of the site. When comparing groundwater data from the 2015 Phase II to the 2017 RI, CVOCs appear to be following the reductive dechlorination pathway, as concentrations of TCE have decreased while cis-1,2-dichloroethene increased between sampling events. Impacts to soil vapor are present at concentrations that will require mitigation according to NYSDOH guidance.

5.7.4 AOC-4: Potential Underground Storage Tank (UST):

Potential gasoline and other chemical USTs were identified in the western portion of the site by the 1942 Certified Sanborn Map. The USTs were no long depicted on the subsequent 1951 Sanborn Map and closure records were not available for review. A soil vapor sample collected during EBC's 2015 Phase II ESI indicated the presence of petroleum-related VOCs in the western portion of the site.

Findings Summary

Geophysical Survey

The geophysical survey identified a large anomaly, potentially consistent with a UST, in the northwestern portion of the site. The location of this UST was not shown on available Sanborn Maps and there are no known records documenting its contents or closure.

Soil

PID readings up to 388.2 ppm and odors were observed during the RI in boring 16B7 from about 6.5 to 7.5 feet bgs, in the vicinity of the USTs identified on the 1942 Sanborn Map. Samples collected in this area from soil borings B6 and B10 during EBC's Phase II ESI exhibited concentrations of petroleum-related VOCs exceeding UU SCOs.

Groundwater

A groundwater sample collected from MW2 during EBC's Phase II ESI detected the presence of methyl tert-butyl ether (MTBE), but at a concentration below its TOGS Class GA SGV. Naphthalene was detected in up-gradient wells at concentrations that exceed TOGS Class GA SGVs suggesting that contamination is due to the historical use of petroleum products at the site or from off-site sources migrating onto the site.

Conclusions

The geophysical survey conducted during this RI identified an anomaly consistent with a potential UST in the northwestern portion of the site, where no tanks were shown on available Sanborn Maps. The 1942 Sanborn Map identified three USTs in the southwestern corner of the site, which were reported closed. EBC's 2015 Phase II ESI identified petroleum impacts in the surrounding soil; however soil; however, analytical results from the 2017 RI did not identify similar petroleum-related impacts to soil or groundwater media in the vicinity of the potential USTs. Petroleum impacts appear to be localized in the east-central portion of the site.

6.0 QUALITATIVE HUMAN AND FISH/WILDLIFE EXPOSURE ASSESSMENT

Human health exposure risk was evaluated for both current and future site and off-site conditions, in accordance with the May 2010 NYSDEC Final DER-10 Technical Guidance for Site Investigation and Remediation. The assessment includes an evaluation of potential sources and migration pathways of site contamination, potential receptors, exposure media, and receptor intake routes and exposure pathways.

In addition to the human health exposure assessment, NYSDEC DER-10 requires an on-site and off-site Fish and Wildlife Resources Impact Analysis (FWRIA) if certain criteria are met. Based on the requirements stipulated in Section 3.10 and Appendix 3C of DER-10, there was no need to prepare an FWRIA for the site. A completed copy of the DER-10 Appendix 3C decision key is included as Appendix I.

6.1 Current Conditions

The site is currently improved with two single-story industrial buildings and two smaller one-story structures, which are surrounding by asphalt on the west and vegetation-covered areas on the east. One of the single-story buildings was formerly occupied by Brooklyn Moto Club and Brooklyn Moto Service LLC as a motorcycle repair shop but at the time of this report all site buildings are vacant.

6.2 Proposed Conditions

The conceptual development plan consists of a new seven-story mixed-use commercial and residential building with cellar-level parking, ground-level retail space, and an elevated rear yard in the northwest part of the second floor. Soil excavation to about 18.5 feet bgs and dewatering is anticipated to facilitate foundation construction.

6.3 Conceptual Site Model

A conceptual site model (CSM) was developed based on the findings of the RI and previous investigations to produce a simplified framework for understanding the distribution of impacted materials, potential migration pathways, and potentially complete exposure pathways, as discussed below.

6.3.1 Potential Sources of Contamination

Potential sources of contamination have been identified and include historic fill, petroleum bulk storage, and historical use of the site and surrounding properties. The site-wide presence of historic fill has been established as a source of SVOCs, pesticides, and metals in soil. Historical petroleum bulk storage has been established as a potential source of petroleum-related VOCs and SVOCs in soil, groundwater, and soil vapor. Historical site uses as an automobile repair facility and varnish factory have been established as a potential source of CVOC impacts to soil, groundwater, and soil vapor. The use of adjacent and surrounding properties for industrial and commercial uses is a potential source for petroleum and CVOC contamination. Prior to site development, there exists the potential for groundwater and soil vapor to migrate off-site and to affect the adjacent property. The following air sampling program will be implemented during the 45-day RAWP public comment period:

- The volunteer commits to contacting owners of the adjacent residential building to the north (214 North 11th Street) to request access and, where feasible, to conduct sub-slab soil vapor and indoor air sampling (three paired indoor air and sub-slab vapor samples). Sub-slab soil vapor sampling would not be feasible if the bottom of the building slab is at or below the water table. If the slab is below the water table and the adjoining building owner allows sampling, three indoor air samples will be collected. The adjacent building to the west is a ventilated parking garage and soil vapor intrusion is not a concern.
- The volunteer commits to collecting three sidewalk soil vapor samples to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

6.3.2 Exposure Media

Impacted media include soil, groundwater, and soil vapor. Analytical data from the RI and previous investigations indicates the historic fill material across the site contains SVOCs, pesticides, and metals. Groundwater impacts include VOCs, SVOCs, and metals. Soil vapor is impacted with both petroleum-related and CVOCs.

6.3.3 Receptor Populations

The site is currently vacant with restricted access to authorized guests and the project development team. Prior to site development, there exists the potential for groundwater and soil vapor to migrate offsite and potentially to affect the adjacent property. As discussed above, the volunteer commits to contacting owners of the adjacent residential building to the north to gain access and, where feasible, conduct sub-slab soil vapor and indoor air sampling. In addition, three sidewalk soil vapor samples will be collected to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

During site development human receptors are limited to construction and remediation workers, authorized guests visiting the site and the public adjacent to the site. Upon completion of removal of impacted soils to below the groundwater table, post-excavation sampling will be used to determine whether there is remaining risk of site-related soil vapor contamination beyond the site boundaries. If it is determined that there is a risk of impacts beyond the site boundaries, a risk assessment will be undertaken to define such risks. Such evaluation will take into consideration the removal of site soil to below the groundwater table and installation of the lowest-level slab below the groundwater table. Under future conditions, receptors will include the new and renovated building occupants, workers, and visitors to the residential property, including children.

6.4 Potential Exposure Pathways – On-Site

6.4.1 Current Conditions

Soil at the site has been shown to be contaminated. The site surface cover is composed of concrete (building slab), asphalt parking, and vegetation. There is a potential exposure pathway in vegetated areas or if the site surface cover is penetrated (e.g., during site investigation when borings or test pit excavation are performed). The potential pathway is through dermal absorption, inhalation and ingestion.

Groundwater at the site has been shown to be contaminated. Groundwater in this area of New York City is not used as a potable water source. There is a potential exposure pathway during groundwater sampling associated with site investigation. The potential pathway is through dermal absorption, inhalation and ingestion. Activity is limited to trained investigation personnel.

Soil vapor at the site has been shown to be contaminated. There is a potential exposure pathway during soil vapor sampling associated with site investigation and intrusion through potential cracks in the building slab. The potential pathway is through inhalation.

6.4.2 Construction/Remediation Condition

Construction and remediation activities will be performed in accordance with a HASP and CAMP. The implementation of these programs, as well as vapor and dust suppression techniques, limit the exposure pathways presented by potential dermal absorption, ingestion, and inhalation.

6.5 Potential Exposure Pathways – Off-Site

Contaminated soil has the potential to be transported off-site by wind in the form of dust or on the tires of vehicles or equipment leaving the site during development and create an exposure risk to the public adjacent to the site. Groundwater is anticipated to flow west, and groundwater samples collected from wells on the southern and most western side of the site indicate volatile contaminants are not migrating off site. Metal impacts to groundwater are considered a regional problem and are not considered a localized concern.

Prior to site development, there exists the potential for soil vapor intrusion into neighboring buildings. However, exposure is expected to be limited by the following:

- The west-adjoining building is an open-air parking garage with natural air ventilation. The open ventilated parking garage prevents the potential for a soil vapor intrusion issue.
- The north-adjoining building was observed during the 2017 Geotechnical Engineering Study to have a waterproofed foundation that extended below the groundwater table. A

foundation set below the groundwater table blocks the migrations or accumulation of soil vapor, which prevents the potential for a soil vapor intrusion issue.

Further, the volunteer commits to contacting owners of the adjacent residential building to the north (214 North 11th Street) to request access and, where feasible, to conduct sub-slab soil vapor and indoor air sampling (three paired indoor air and sub-slab vapor samples). Sub-slab soil vapor sampling would not be feasible if the bottom of the building slab is at or below the water table. If the slab is below the water table and the adjoining building owner allows sampling, three indoor air samples will be collected. The adjoining building to the west is a ventilated parking garage and soil vapor intrusion is not a concern. In addition, three sidewalk soil vapor samples will collected to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

The potential off-site migration of site contaminants is not expected to result in a complete exposure pathway for construction and remediation, or future conditions for the following reasons:

- The site is located in an urban area and predominantly covered with continuous, relatively impervious surface covering (i.e. buildings, and concrete slabs and asphalt)
- During site remediation and construction, the following protective measures will be implemented:
    - Air monitoring will be conducted for particulates (i.e., dust) and VOCs during intrusive activities as part of a CAMP. Dust and/or vapor suppression techniques will be employed to limit potential for off-site migration of soil and vapors.
    - Vehicle tires and undercarriages will be washed as necessary prior to leaving the site to prevent tracking material off-site.
    - A soil erosion/sediment control plan will be implemented during construction to control off-site migration of soil.
- Based on the conceptual development plan, foundation excavation is anticipated to remove all on-site impacted media, thereby eliminating all sources of site contamination and achieving a Track 1 cleanup for unrestricted use. In this scenario, exposure pathways will have been eliminated and the need for future control will not be necessary. If a Track 1 cleanup is not practicable, the development will include a site capping system.
- Accumulation of soil vapor beneath the building will be limited by the building foundation, which will extend into the groundwater table and include a continuous site-wide waterproofing system installed below the slab and along the vertical subgrade foundation sidewalls. The northwestern portion of the building cellar will likely be used

as parking with a ventilation system in accordance with the NYC Building and Mechanical Codes.

6.6 Evaluation of Human Health Exposure

Based upon the CSM and review of environmental data, complete on-site exposure pathways appear to be present, in the absence of protective measures and remediation. The complete exposure pathways indicate there is a risk of exposure to humans from site contaminants via exposure to soil, groundwater, and soil vapor for current and construction conditions.

Complete exposure pathways have the following five elements: 1) a contaminant source; 2) a contaminant release and transport mechanism; 3) a point of exposure; 4) a route of exposure; and 5) a receptor population. A discussion of the five elements comprising a complete pathway as they pertain to the site is provided below.

6.6.1 Current Conditions

Contaminant sources include 1) historic fill with varying levels of SVOCs, pesticides, and metals contamination; 2) historical petroleum bulk storage with petroleum-impacted soil, groundwater and soil vapor; and 3) historical site uses that may contribute to releases of CVOCs impacting soil, groundwater, and soil vapor and 4) historical uses of adjacent and surrounding sites that may contribute to the releases of CVOCs and petroleum-related contaminants in groundwater and soil vapor.

Contaminant release and transport mechanisms include contaminated soil transported as dust (dermal, ingestion, inhalation), contaminated groundwater flow (dermal contact), and volatilization of contaminants from the soil and groundwater matrices to the soil vapor phase (inhalation).

Under current conditions, the likelihood of exposure to humans is limited, as site access is restricted to authorized workers and guests. The majority of the site contains impervious covers (i.e., buildings, concrete, asphalt) and pervious areas are covered by overgrown vegetation, which have potential to control dust being generated. Exposure to contaminants in soil and groundwater via dermal contact or ingestion during investigation is minimized, as these activities would occur under a HASP/CHASP with CAMP to limit exposure to site workers and the community. In addition, groundwater is not used as potable water supply in Brooklyn.

6.6.2 Construction/Remediation Activities

During development and remediation, points of exposure include disturbed and exposed soil during excavation, dust and organic vapors generated during excavation, and contaminated groundwater that could be encountered during excavation and/or dewatering operations. Routes of exposure include ingestion and dermal absorption of contaminated soil and groundwater, inhalation of organic vapors arising from contaminated soil and groundwater (specifically in the area of petroleum and CVOC impacts), and inhalation of dust arising from contaminated soil. The receptor population includes construction and remediation workers and, to a lesser extent, the public adjacent to the site.

The potential for completed exposure pathways is present since all five elements exist; however, the risk will be minimized by the implementation of appropriate health and safety measures, such as monitoring the air for organic vapors and dust, using vapor and dust suppression measures, cleaning truck undercarriages before they leave the site to prevent off-site soil tracking, maintaining site security, and wearing the appropriate personal protective equipment (PPE).

6.6.3 Proposed Future Conditions

The proposed future conditions may include a Track 1 cleanup for unrestricted use (i.e., removal of all source and site contaminants), which would eliminate all on-site pathways of exposure to contaminants. If a Track 1 cleanup is not practicable, residual contaminants may remain on site and exposure pathways would be minimized through the use of engineering and institutional controls. In the event that the proposed building foundation is constructed below the water table, the airspace between groundwater and the bottom of foundation where contaminants in soil or groundwater could volatile into the vapor phase would be eliminated. In this scenario, points of exposure include future intrusive soil and groundwater handling for upgrades or modifications to the property.

6.6.4 Human Health Exposure Assessment Conclusions

1. Under current conditions, there is a marginal risk for human exposure to site contaminants. The primary exposure pathways are for dermal contact, ingestion, and inhalation of soil, soil vapor, or groundwater by site investigation workers. The exposure risks can be avoided or minimized by following the appropriate health and safety and vapor and dust suppression measures outlined in the site-specific HASP and CAMP during investigation activities.

   Prior to site development, there exists the potential for soil vapor intrusion into neighboring buildings. However, exposure is expected to be limited by the following:

   - The west-adjoining building is an open-air parking garage with natural air ventilation. The open ventilated parking garage prevents the potential for a soil vapor intrusion issue.
   - The north-adjoining building was observed during the 2017 Geotechnical Engineering Study to have a waterproofed foundation that extended below the groundwater table. A foundation set below the groundwater table blocks the migration or accumulation of soil vapor, which prevents the potential for a soil vapor intrusion issue.

   The following air sampling program will be implemented during the 45-day RAWP public comment period:

- The volunteer commits to contacting owners of the adjacent residential building to the north (214 North 11th Street) to request access and, where feasible, to conduct sub-slab soil vapor and indoor air sampling (three paired indoor air and sub-slab vapor samples). Sub-slab soil vapor sampling would not be feasible if the bottom of the building slab is at or below the water table. If the slab is below the water table and the adjoining building owner allows sampling, three indoor air samples will be collected. The adjoining building to the west is a ventilated parking garage and soil vapor intrusion is not a concern.
- The volunteer commits to collecting three sidewalk soil vapor samples to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

2. In the absence of a HASP and CAMP, there is a moderate risk of exposure during construction and remediation activities. The primary exposure pathways are:
    a. Dermal contact, ingestion and inhalation of contaminated soil, groundwater or soil vapor by construction workers.
    b. Dermal contact, ingestion and inhalation of soil (dust) and inhalation of soil vapor by the community in the vicinity of the site.

    These exposure risks can be avoided or minimized by performing community air monitoring and by following the appropriate health and safety, vapor and dust suppression and site security measures outlined in a site-specific HASP.
3. The existence of a complete exposure pathway for site contaminants to human receptors during proposed future conditions is unlikely, as a large quantity of soil will be excavated and transported to an off-site disposal facility and any residual soil remaining will be capped with an impermeable foundation cover. Residual contamination would be managed in accordance with a Site Management Plan that would be prepared, if necessary, following site development.
4. Regional groundwater is not used as a potable water source in Brooklyn so exposure to regional groundwater contaminants is unlikely.
5. Construction of the proposed development will include excavation and off-site disposal of contaminated media to about 18.5 feet bgs, terminating within a native organics layer. Residual contamination will be limited following construction. Implementation of a dewatering treatment system is expected in combination with the support of excavation (SOE) system to install the building's foundation below the static groundwater table. Soil vapor contamination originating from groundwater is anticipated to be removed through the dewatering and treatment system. Reducing, and possibly

eliminating, on-site sources of soil vapor contamination through construction means will limit or prevent exposure to off-site receptor populations.

7.0 NATURE AND EXTENT OF CONTAMINATION

This section evaluates the nature and extent of soil, groundwater, and soil vapor contamination as derived from a combination of field observations and analytical data that were discussed in Section 5.0 and from previous investigations.

7.1 Soil Contamination

The following discussion is divided by the following contaminant classifications:

1. Historic Fill
2. Petroleum-Impacted Material
3. CVOC-Impacted Material

7.1.1 Historic Fill Material

Contaminants related to historic fill material at the site include SVOCs, pesticides, and metals. Historic fill exists across the site, extending from surface grade to depths ranging from about 6 to 11.5 feet bgs. Eleven soil samples collected from the historic fill layer contained concentrations of SVOCs (including 3-methylphenol/4-methylphenol, phenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene,), metals (including arsenic, cadmium, trivalent chromium, copper, silver, nickel, selenium, zinc, lead, and mercury), and pesticides (4,4'-DDE, 4,4'-DDT, dieldrin) exceeding their respective UU and, in some cases, RURR SCOs.

7.1.2 Petroleum-Contaminated Material

Petroleum impacts to soil (evident by PID readings above background, odors, and staining) at depths ranging from 7 to 13.5 feet bgs were observed during the RI in borings 16B1, 16B2, 16B3 and 16B7 and during the Preliminary Site Investigation in borings LB01 and LB02. These impacts generally correspond with the observed groundwater interface. The maximum PID reading, 634.1 ppm, was recorded in 16B3 from 7 to 8 feet bgs. Soil boring 16B1, located up gradient to the potential USTs, contained gross staining and product from about 7 to 13.5 feet bgs. Analytical results for soil samples collected from 16B1, 16B3, 16B8, LB02 and LB05 exhibited concentrations of petroleum-related VOCs, including 1,2,4-trimethlybenzene, benzene, naphthalene, and total xylenes, exceeding UU SCOs in surficial samples and samples collected around the groundwater table. Soil boring logs from the Preliminary Investigation Report are included in Appendix A.

7.1.3 CVOC-Contaminated Material

Concentrations of CVOCs in excess of their respective UU SCOs were identified in surficial soil samples and samples collected around the groundwater interface from RI borings 16B1, 16B2, 16B3, 16B5, 16B6, 16B8, and 16B10, and previous borings B1, B2, B3, B4, B5, B6, B8, B10, and B11. The samples exhibiting concentrations of TCE exceeding UU SCOs were collected from the northwest, west-central and eastern portions of the site. The highest concentrations of TCE and its degradation byproducts (vinyl chloride, 1,2-DCE) were detected up to 8 feet bgs generally in the north and eastern portions of the site. CVOCs were detected at a maximum depth of about 12 feet bgs across the site, consistent with the approximate start of the clay stratigraphy. Therefore, it is likely that the clay layer is acting as a vertical barrier to potential vertical migration of CVOCs. The presence of CVOCs in soil are likely due to a release during site historical operations.

7.2 Groundwater Contamination

The discussion is divided by the following contaminant classifications:

1. Petroleum-Contaminated Groundwater
2. CVOC-Contaminated Groundwater
3. Regional Groundwater Quality

7.2.1 Petroleum-Contaminated Groundwater

Analytical results for samples collected from wells MW3 and 16MW1 in the central portion of the site exhibited concentrations of petroleum-related VOCs, including 1,2,4-trimethylbenzene, and naphthalene, exceeding their respective TOGS Class GA SGVs. During the EBC Phase II ESI, a black liquid was encountered in monitoring well MW3. EBC collected a sample for identification and determined the liquid most closely resembled No. 6 fuel oil. A black liquid or non-aqueous phase liquid (NAPL), was not observed when the same well was sampled during the 2017 RI. According the analytical results, petroleum contamination in groundwater appears localized to the central and eastern portions of the site in the vicinity of wells MW3 and 16MW1, likely due to a release in this area or an off-site source migrating on-to the site.

7.2.2 CVOC-Contaminated Groundwater

Analytical results revealed CVOC impacts to groundwater localized in the central and eastern portions of the site. Concentrations of CVOCs, including 1,1-dichloroethane, cis-1,2-dichloroethene, TCE, and vinyl chloride exceeding their respective TOGS Class GA SGVs, were found in samples collected from wells MW3, MW4, 16MW1, 16MW2 and 16MW3. When comparing groundwater analytical data from the 2015 Phase II to the 2017 RI, concentrations of TCE has decreased, while concentrations of breakdown daughter products 1,1-dichloroethane and vinyl chloride have increased. This shift from parent to daughter products suggests that CVOCs in groundwater are following the reductive dechlorination pathway.

7.2.3 Regional Groundwater Quality

Metals concentrations detected above TOGS Class GA SGVs include eight total metals (arsenic, iron, lead, manganese, mercury, nickel, sodium, and zinc) and six dissolved metals (arsenic, iron, manganese, nickel, sodium, and zinc). With the exception of arsenic, the concentrations detected are attributed to regional groundwater contamination and are not considered a localized concern. The presence of arsenic at a concentration above its TOGS Class GA SGV may be the result of historical site uses as manufacturing or due to the quality of the historic fill.

7.3 Soil Vapor Contamination

A total of 43 VOCs, including petroleum-related and chlorinated VOCs, were detected in soil vapor samples across the site. Total CVOC concentrations in soil vapor ranged from 178.6 $\mu g/m^3$ in SG-6 to 259,057 $\mu g/m^3$ in SG-4. Total BTEX concentrations in soil vapor samples ranged from 93.8 $\mu g/m^3$ in SG-5 to 374.8 $\mu g/m^3$ in SG-2. The highest concentrations of CVOCs and BTEX compounds were detected in the central and eastern portions of the site, which is consistent with the locations of petroleum- and CVOC-contaminated groundwater.

8.0 CONCLUSIONS

The RI was implemented between November 20 and 29, 2017. The findings summarized herein are based on both qualitative data (field observations and instrumental readings), and laboratory analytical results of soil, groundwater, and soil vapor samples collected during the RI and previous investigations. Findings and conclusions are as follows:

1. Stratigraphy: A historic fill layer was observed from surface grade to depths ranging from about 6 feet bgs in 16B5 to 11.5 feet bgs in 16B8 and consisted of brown, fine- to medium-grained sand with varying amounts of gravel, brick, concrete, asphalt, silt, glass, wood, coal fragments and slag. The fill layer is underlain by native soils typically consisting of fine silty sands. A clay layer was observed beginning at about 11 feet bgs and extending to at least to about 20 feet bgs. Based on findings from the geotechnical exploration, bedrock was not encountered within 100 feet of site grades.
2. Hydrogeology: Groundwater was encountered at about 6 to 6.5 feet bgs and is interpreted to flow west towards to East River.
3. Historic Fill Quality: Fill contains SVOCs, metals, and pesticides at concentrations above UU and/or RURR SCOs. VOCs were also identified within the historic fill, but are associated with potential chemical releases from historical uses of the site and surrounding sites.
4. Petroleum-Impacted Soil, Groundwater and Soil Vapor:
    a. Field observations identified petroleum impacts, evidenced by odors, staining, and PID readings above background levels, in soil to depths of about 13.5 feet bgs in the central and eastern portions of the site. Product, staining, and/or odors were observed in boring 16B1 from 7 to 13.5 feet bgs, terminating within the clay layer. Petroleum-related constituents were detected at concentrations above UU and, in some areas, above RURR SCOs in soil samples collected from depths to about 12 feet bgs (B3).
    b. Petroleum-related VOCs were detected in groundwater at concentrations exceeding TOGS Class GA SGVs at wells located in the central and eastern portions of the site, which are up-gradient to the USTs identified on the 1942 Sanborn Map and by the GPR survey. During the EBC Phase II ESI, a black liquid was encountered in monitoring well MW3. EBC collected a sample for identification and determined the liquid most closely resembled No. 6 fuel oil. NAPL or other free product was not observed in any of the sampled wells during the 2017 RI.
    c. Petroleum-related constituents (including BTEX) were identified in soil vapor samples collected throughout the site.

   d. The presence of petroleum-related VOCs and SVOCs in soil is attributed to potential releases associated with the former auto repair facilities and historical USTs. The petroleum-related contamination in groundwater and soil vapor may be attributed to a combination of releases from site operations and adjacent and surrounding properties.

5. <u>CVOC-Impacted Soil, Groundwater and Soil Vapor</u>: Analytical data revealed concentrations of CVOCs in soil exceeding UU SCOs generally to depths of about 8 feet bgs and up to a maximum depth of about 12 feet bgs. CVOCs were also identified in groundwater samples at concentrations that exceed TOGS Class GA SGVs in the central and eastern portions of the site. CVOC impacts were identified in soil vapor samples collected across the site, with the highest concentrations located in the central and eastern portions of the site. The presence of CVOCs in soil, groundwater and soil vapor is likely a combination of releases from historical site uses as a repair facility and chemical warehouse or an off-site source.

Sufficient analytical data were gathered during the RI, together with previous studies, to establish site-specific soil cleanup levels and to develop a remedy for the site. The final remedy will be described and evaluated in a RAWP to be prepared in accordance with NYS BCP guidelines. The remedy will address historic fill impacted with SVOCs pesticides and metals; petroleum- and CVOC-impacted soil, groundwater and soil vapor; potential soil vapor intrusion conditions; and a contingency plan for the removal and closure of unknown USTs.

9.0 REFERENCES

1. Busciolano, Ronald. 2002. "Water-Table and Potentiometric-Surface Altitudes of the Upper Glacial, Magothy, and Lloyd Aquifers on Long Island, New York, in March-April 2000, with a Summary of Hydrogeologic Conditions."
2. New York State Department of Health, Final Guidance for the Evaluation of Soil Vapor Intrusion in the State of New York, dated October 2006 and applicable revisions (March 2017).
3. New York State Department of Environmental Conservation, Division of Environmental Remediation, Draft Brownfield Cleanup Program Guide, dated May 2004.
4. New York State Department of Environmental Conservation, DER-10 Technical Guidance for Site Investigation and Remediation, issued May 3, 2010; effective June 18, 2010.
5. New York State Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) dated June 1998.
6. United States Environmental Protection Agency, Low Flow Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, EQASOP-GW 001, January 19, 2010.
7. New York State Department of Environmental Conservation, Part 375 of Title 6 of the New York Compilation of Codes, Rules, and Regulations, Effective December 14, 2006.
8. Environmental Business Consultant (EBC) Phase I Screening Summary, dated August 2015
9. EBC Phase II Investigation Data Summary, dated July 23, 2015
10. EBC Remedial Investigation Work Plan, February 8, 2017
11. Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. Preliminary Site Investigation, dated October 20, 2017

Tables

REMEDIAL INVESTIGATION REPORT

for

215 NORTH 10TH STREET
BROOKLYN, NEW YORK

NYSDEC BCP NO.: C224229

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October 1, 2018
Langan Project No. 170482201

LANGAN

CERTIFICATION

I, Jason J. Hayes, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Jason J. Hayes, P.E.

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AWQS	Ambient Water Quality Standards and Guidance Values
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
Bgs	Below grade surface
BTEX	Benzene, Toluene, Ethlylbenzene, and Xylenes
CAMP	Community Air Monitoring Program
COC	Contaminant of Concern
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
DUSR	Data Usability Summary Report
EDR	Environmental Data Resources
ELAP	Environmental Laboratory Approval Program
EPA	United Stated Environmental Protection Agency
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
FWRIA	Fish and Wildlife Resources Impact Analysis
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
ID	Inside Diameter
IDW	Investigation Derived Waste
IRM	Interim Remedial Measure
IRMWP	Interim Remedial Measure Work Plan
LNAPL	Light Non-Aqueous Phase Liquid
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTBE	Methyl tert butyl ether
NAVD88	North American Vertical Datum of 1988
NYCRR	New York City Rules and Regulations
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation
NTU	Nephelometric Turbidity Units
OD	Outside Diameter
ORP	Oxidation-Reduction Potential
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PID	Photoionization Detector
PPE	Personal Protective Equipment

Acronym	Definition
Ppm	Parts per million
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RURR	Restricted Use Restricted-Residential Use
SCO	Soil Cleanup Objective
SMDS	Sub-Membrane Depressurization System
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOGS	Technical and Operational Guidance Series
UN/DOT	United Nations/Department of Transportation
USGS	United States Geological Survey
UST	Underground Storage Tank
UU	Unrestricted Use
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Remedial Investigation Report (RIR) was prepared on behalf of 215 N 10 Partner LLC (the Volunteer) for the property located at 215 North 10th Street in the Williamsburg neighborhood of Brooklyn, New York (the "site"). The Volunteer entered into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) to remediate the site in conjunction with new development, pursuant to a Brownfield Cleanup Agreement (BCA), dated February 23, 2018, for Site No. C224229. The site is also listed with an 'E' designation (E-138) for hazardous materials, resulting from a City Environmental Quality Review (CEQR) during the May 2005 Greenpoint-Williamsburg rezoning (CEQR #04DCP003K). Satisfaction of the 'E'-Designation requirements is subject to review and approval by the New York City Mayor's Office of Environmental Remediation (NYCOER).

This RIR presents environmental data and findings from a remedial investigation (RI) that was implemented by Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology D.P.C. (Langan) between November 20 and 29, 2017. The objective of the RI was to supplement existing environmental data and determine, to the extent possible, the nature and extent of contamination in soil, soil vapor, and groundwater. Information presented in this RIR will be used to evaluate appropriate remedial action alternatives.

2.0 SITE PHYSICAL CHARACTERISTICS

2.1 Site Description

The 18,000-square-foot site is located at 215 North 10th Street in the Williamsburg neighborhood of Brooklyn, New York and is identified as Brooklyn Borough Tax Map Block 2299, Lot 21. The site is improved with two single-story industrial buildings and two one-story structures, all of which are vacant. The exterior portions contain an asphalt-paved alley on the west and vegetation-covered areas on the east that were formerly used for parking. The site is bounded by North 10th Street to the south, Roebling Street to the east, and a multi-story residential apartment building to the north that wraps around to the west. A Site Location Map and Site Plan are provided as Figure 1 and Figure 2, respectively.

2.1.1 Description of Surrounding Properties

The site is located in an urban area primarily characterized by residential, commercial, and light industrial properties. Surrounding property usage is summarized in the following table:

Direction	Block	Lot	Adjoining Properties	Surrounding Properties
North	2299	9	Warehouse 11 Condominium (214 North 11th Street)	Multiple-story mixed-use residential and commercial buildings
		1	Finailly Inc. Fushimi, NYC Pet, Apartments (475 Driggs Street)	
South	2307	1	250 N 10th Apartments (250 N 10th Street)	Multiple-story residential building
East	2300	1	Roebling View North (15 Roebling Street)	Multiple-story residential building
West	2306	8	Trans Boro Fuel Oil Co.	Mixed-use commercial, residential and industrial buildings
		9	Montrose Equipment Sales (202 North 10th Street)	
		15	The Driggs North (220 N 10th Street)	
		18	Under Construction (28 Roebling Street)	

Land use within a half mile of the site is urbanized and includes mixed-use buildings, subway tunnels, park land, and school facilities. The nearest ecological receptor is the East River, located about 3,000 feet west of the site. Sensitive receptors located within a half-mile of the site are listed in the following table:

Number	Name (Approximate distance from Site)	Address
1	Northside Catholic Academy St. Vincent (approximately 0.2 miles southwest)	10 Wither Street Brooklyn, NY 11211
2	Williamsburg High School for Architecture and Design (approximately 0.3 miles south)	257 North 6th Street Brooklyn, NY 11211
3	Conselyea Preparatory School (approximately 0.3 miles south)	208 North 5th Street Brooklyn, NY 11211
4	PS 17 Henry D. Woodworth (approximately 0.3 miles south)	208 North 5th Street Brooklyn, NY 11211

Number	Name (Approximate distance from Site)	Address
5	Williamsburg Northside Preschool (approximately 0.3 miles south)	152 North 5th Street Brooklyn, NY 11211
6	Automotive High School (approximately 0.4 miles north)	50 Bedford Avenue Brooklyn, NY 11211
7	Brooklyn Preparatory High School (approximately 0.4 miles south)	257 North 6th Street Brooklyn, NY 11122
8	P.S. 132 The Conselyea School (approximately 0.45 miles southeast)	320 Manhattan Avenue Brooklyn, NY 11211
9	School Settlement Association (approximately 0.5 miles east)	120 Jackson Street Brooklyn, NY 11211

A map showing the surrounding land uses with descriptions of the adjoining properties is included as Figure 3.

2.1.2 Topography

According to a United States Geological Survey (USGS) 7.5 minute Topographic Quadrangle Map for Brooklyn, NY, the site elevation ranges from about 7.75 to 9 feet as referenced to the North American Vertical Datum of 1988 (NAVD88) and gradually slopes downward to the east.

2.1.3 Surface Water and Drainage

The eastern portion of the site has a limited area of pervious soil and overgrown vegetation, which allows for rainwater infiltration during storm events. The central and western portions of the site are improved with either buildings or asphalt lots. Runoff from this area typically drains through stormwater connections or catch basins into city sewers.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panels 3604970202F and 3604970204F, dated 5 September 2007 show that the site is in Zone AE with a base flood el 10 feet NGVD29 (about el 8.9 feet NAVD88). Zone AE is defined as a special flood hazard area and is subject to inundation by the 1 percent annual chance flood.

2.1.4 Wetlands

Potential wetlands on or near the site were evaluated by reviewing the National Wetlands Inventory and NYSDEC regulated wetlands. There are no mapped wetlands located on or near the site.

2.2 Geology and Hydrogeology

2.2.1 Regional and Site Geology

The surficial geology of Brooklyn was influenced by the last glacial advance and retreat across New York City. As the glaciers advanced south, soil and rock were scraped from the surface and deposited at the limit of the ice advance as a wall of soil and rock called the *terminal moraine*. The site is north of the terminal moraine, in the *ground moraine*, which is an area of low relief where extensive till (heterogeneous mixtures of clay, silt, sand, gravel and boulders ranging widely in size and shape) typically accumulated during the advance, or retreat of the glacier.

The site is underlain by the Hartland formation bedrock consisting of granite, schist and amphibolite. Bedrock is generally over 100 feet below grade in this area of Brooklyn.

According to the preliminary site investigation conducted by Langan on October 20 2017, the subsurface strata consists of historic fill material characterized by loose, brown, medium sand with varying amounts of coarse sand, silt, fine gravel, coal, slag, glass, ceramic, coal ash, wood, brick and concrete fragments. The fill layer extended to depths ranging from about 7.5 to 11 feet below grade surface (bgs). The fill layer was underlain by native soil characterized by loose, brown, medium sand with varying amounts of silt and fine gravel, and localized soft dark grey peat.

2.2.2 Regional and Site Hydrogeology

Groundwater flow is typically topographically influenced, as shallow groundwater tends to originate in areas of topographic highs and flows toward areas of topographic lows, such as rivers, stream valleys, ponds, and wetlands. A broader, interconnected hydrogeological network often governs groundwater flow at depth or in the bedrock aquifer. Groundwater depth and flow direction are also subject to hydrogeologic and anthropogenic variables such as precipitation, evaporation, extent of vegetation cover, and coverage by impervious surfaces. Other factors influencing groundwater include depth to bedrock, the presence of artificial fill, and variability in local geology and groundwater sources or sinks. The majority of runoff drains to the city sewers, which connect to one of the several wastewater treatment plants servicing the city.

Groundwater in this part of New York City is not used as a potable water source. Potable water provided to the City of New York is derived from surface impoundments in the Croton, Catskill, and Delaware watersheds.

Based on previous investigations, groundwater depth is expected at about 6 to 7 feet bgs and appears to flow west towards the East River.

3.0 SITE BACKGROUND

3.1 Historical Site and Surrounding Properties Use

The site and surrounding area have been developed since the early 1900s and are located in an urban setting historically characterized by industrial and commercial development. Historical uses of the property have included a dry color (powdered pigment) and paint storage facility, varnish research works, chemical warehouse, office building, and a commercial bike repair. The majority of the site uses have been warehousing and storage.

Based on historical database listings, the site formerly contained three underground storage tanks (USTs). The following tanks associated with the site have been registered, removed from site, and closed:

- Tank 1 – 5,000-gallon hydrochloric acid UST (closed in 1992)
- Tank 2 – 12,000-gallon ammonium hydroxide UST (closed in 1992)
- Tank 3 – 2,000-gallon nitric acid UST (closed in 1991)

The 1942 Sanborn Map identified one benzene tank and two gasoline tanks on site. There is inconsistent reporting throughout the previous reports regarding the number of tanks and their contents; however, no documentation regarding the current status of these tanks was available for review.

NYSDEC Spill No. 1505078 was reported on August 11, 2015, when an unknown quantity of petroleum was identified in a centrally-located monitoring well during Environmental Business Consultants' (EBC) Phase II Environmental Site Investigation. The NYSDEC closed the spill on September 21, 2015.

Adjoining properties were historically used for residential, commercial, and industrial operations. Historical uses of the site and surrounding properties are shown in Figure 4.

3.2 Proposed Redevelopment Plan

The proposed development plan consists of a seven-story mixed-use commercial and residential building with cellar-level parking, ground-level retail space, and an elevated rear yard in the northwest part of the second floor. The proposed end-use of the development is consistent with existing zoning regulations. As currently conceived, the building would cover the entire 18,000-square-foot lot and would require excavation to about 18.5 feet bgs for construction of the building foundation. Support of excavation and dewatering are anticipated to facilitate construction of foundation elements. Remediation would occur prior to and concurrently with redevelopment and would be completed in accordance with an approved Remedial Action Work Plan (RAWP) and site-specific Construction Health and Safety Plan (CHASP).

3.3 Previous Environmental Reports

Environmental reports prepared for the site include the following:

- 2015 Phase I Environmental Site Assessment Screening, prepared by EBC
- July 23, 2015 Phase II Subsurface Investigation Data Summary, prepared by EBC
- February 8, 2017 Remedial Investigation Work Plan, prepared by EBC
- October 20, 2017 Preliminary Site Investigation, performed by Langan

Reports are summarized below and available reports are included in Appendix A.

July 23, 2015 Phase II Subsurface Investigation Data Summary, prepared by EBC

The Phase II was completed in July 2015 and consisted of the following:

- A ground-penetrating radar (GPR) survey
- Advancement and sampling of 11 soil borings
- Collection of 4 groundwater samples
- Collection of 6 soil vapor samples

The Phase II findings and conclusions are as follows:

- GPR survey: A GPR survey was conducted in the suspect tank areas identified on the 1942 Sanborn Maps (south-western portion of the site) and in the proposed rear yard areas (northern portion of the site). No anomalies associated with tanks were observed.
- Soil: Trichloroethene (TCE) and tetrachloroethene (PCE) were identified in shallow and deep borings above Unrestricted Use (UU) and Restricted Use Restricted-Residential (RURR) Soil Cleanup Objectives (SCOs) with maximum concentrations of 220 milligrams per kilogram (mg/kg) and 9.4 mg/kg, respectively. SVOCS, including benzo(a)anthracene, benzo(a)pyrene, and chrysene (maximum concentrations ranging from 5 to 6.2 mg/kg), were detected above RURR SCOs primarily in shallow soils, and two deep soil locations on the east side of the site. Concentrations of arsenic (max 234 mg/kg), lead (max 8,530 mg/kg), and mercury (max 28.8 mg/kg) were detected above RURR SCOs across the site in shallow and deep soil intervals.
- Groundwater: Groundwater was encountered about 6 to 7 feet bgs and was identified to flow toward the west. TCE, cis-1,2-dichloroethene, and vinyl chloride were detected in groundwater within the central and northeast portions of the site above NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA drinking water at maximum concentrations of 240 micrograms per liter (µg/L), 30 µg/L, and 15 µg/L, respectively. A black liquid, most closely resembling No. 6 fuel oil, was identified while groundwater sampling at monitoring well MW03, located in the central part of the site. The sample

from MW03 contained naphthalene above TOGS Class GA SGVs at a maximum concentration of 31 µg/L.

- Soil Vapor: TCE (up to 243,000 micrograms per cubic meter [$\mu g/m^3$]), PCE (up to 7,730 $\mu g/m^3$), carbon tetrachloride (up to 6,350 $\mu g/m^3$), and 1,1,1-trichloroethane (up to 6,000 $\mu g/m^3$) were detected in soil vapor samples collected from about 6 feet below sidewalk grade.

August 2015 Phase I Environmental Site Assessment (ESA) Screening, prepared by EBC

The Phase I ESA report identified the following Recognized Environmental Conditions (REC) for the site:

- The site was used for manufacturing and industrial operations, including the following:
  - A dry color (powdered pigment) and paint storage facility circa 1905 to 1916.
  - A varnish research works (1942 and 1951), which is associated with the use of chlorinated solvents that have potential for release to the environment.
  - A chemical warehouse until at least 1965 when it is then described as an office.
- The 1942 Sanborn Map identified one benzene tank and two gasoline tanks on site. There is inconsistent reporting throughout the text regarding the number of tanks and their contents; however, no documentation regarding the current status of these tanks, or documentation regarding soil and groundwater quality was identified during this assessment.

Although not identified as RECs in the report text, the following concerns were also identified.

- Based on database listings, the site formerly contained three USTs:
  - Tank 1 – 5,000-gallon hydrochloric acid UST (closed in 1992)
  - Tank 2 – 12,000-gallon ammonium hydroxide UST (closed in 1992)
  - Tank 3 – 2,000-gallon nitric acid UST (closed in 1991)
- The site is listed with an E-designation (E-138) for Hazardous Materials following the May 2005 Greenpoint-Williamsburg Contextual Rezoning action (CEQR #04DCP003K).

February 8, 2017 Remedial Investigation Work Plan, prepared by EBC

A Remedial Investigation Work Plan (RIWP) was prepared for Atlas Alley LLC on February 8, 2017 under the NYS BCP and approved by NYSDEC on May 1, 2017. The Volunteer for BCP Site No C224229 implemented the approved RIWP, which consisted of the following:

- Installation of 11 soil borings to about 15 feet bgs to delineate the extent of soil impacts and to obtain information on soil quality with respect to Track 1 UU SCOs; and

- Installation of 3 groundwater monitoring wells to about 15 feet bgs and sampling from two existing wells (MW3 and MW4) to assess groundwater quality and to delineate the extent of previously detected VOCs, SVOCs, and metals concentrations.

October 20, 2017 Preliminary Site Investigation, performed by Langan

A Preliminary Site Investigation was completed in October 2017 to support conceptual design of the future building. Five soil borings were advanced up to 20 feet bgs and two soil samples were collected from each boring. The Preliminary Site Investigation findings and conclusions are as follows:

- Historic fill was identified to depths between 8 and 11 feet bgs. Sand, peat, and organic clay were identified underlying the historic fill. Petroleum-like contamination (i.e., staining, sheen, odor, and photoionization detector [PID] measurements above background) was observed at LB01, which is in proximity to MW03 where No. 6 fuel oil was reportedly identified during EBC's 2015 Phase II.
- TCE, benzene, cis-1,2-dichloroethene and methylene chloride were identified in soil borings above UU SCOs with maximum concentrations of 7.1 mg/kg, 0.78 mg/kg, 9.37 mg/kg and 0.16 mg/kg, respectively. SVOCS, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene (up to 3.7 mg/kg) were detected above RURR SCOs across the site. Concentrations of arsenic (max 55 mg/kg), lead (max 752 mg/kg), and mercury (max 1.4 mg/kg) were detected above RURR SCOs. Soil boring LB05, located in the south-central portion of the site, contained petroleum-related VOCs at concentrations above UU SCOs. In general, target compounds were detected above RURR SCOs at depths up to 12 feet bgs throughout the site.

A separate report was not prepared for the October 2017 site investigation and the findings and results are discussed in this RIR.

3.4 Areas of Concern for Investigation

The following areas of concern (AOCs) represent portions of the site that required further investigation and were developed based on site observations, the site development history, and the findings of the previous environmental reports. The AOCs that were investigated include the following:

1. AOC 1 – Historic Fill: AOC 1 represent a layer of historic fill of unknown origin identified between ground surface to about 11 feet bgs. According to EBC's Phase II and Langan's Preliminary Site Investigation, historic fill is generally characterized as loose, brown, medium sand with varying amounts of black gravel, coal, slag, glass, wood, organics, red and brown clay, black to brown silt, and brick and concrete fragments. Contaminants associated with historic fill were identified in surface soil samples, including concentrations of SVOCs and metals above UU and RURR SCOs.

2. AOC 2 –Petroleum-Related Impacts in Soil and Groundwater: EBC's Phase II ESI identified petroleum-related impacts to soil, groundwater, and soil vapor, concentrated around the east-central portion of the site. Petroleum-related VOCs, including BTEX[1], naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethlybenzene, were identified in soil and groundwater. During the EBC Phase II ESI, a black liquid was encountered in monitoring well MW3. EBC collected a sample for identification and determined the liquid most closely resembled No. 6 fuel oil. Impacts are potentially associated with historic site use or off-site sources migrating onto the site.

3. AOC 3 – Chlorinated VOCs (CVOC) in Soil, Groundwater, and Soil Vapor: CVOC impacts have been detected in soil, groundwater, and soil vapor at concentrations exceeding UU and RURR SCOs. Soil impacts were identified between about 5 and 12 feet bgs in nine of the eleven previous borings, primarily within the east-central portion of the site. Two groundwater samples collected from the east-central portion of the site contained CVOCs at concentrations up to one to two orders of magnitude above their respective TOGS Class GA SGVs. Total CVOC concentrations in soil vapor ranged from 858.74 $\mu g/m^3$ in sample SG-6 to 263,934 $\mu g/m^3$ in sample SG-4. Impacts are potentially associated with historic site use or historic and current use of the surrounding properties.

4. AOC 4 – Potential Underground Storage Tank (UST): AOC 4 represents the locations of potential USTs in the western portion of the site that were identified on the 1942 Sanborn Map; the tanks were no longer shown on the subsequent 1951 Sanborn Map. One soil and one groundwater sample were collected in the vicinity of the suspected USTs during EBC's Phase II ESI and the analytical results identified the presence of petroleum-related compounds in both media.

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[1] BTEX: A group of petroleum-related compounds consisting of benzene, toluene, ethylbenzene and total xylenes.

4.0 FIELD INVESTIGATION

The purpose of the RI was to further delineate the nature and extent of impacts in accordance with DER-10-3.1 to formulate a conceptual site model and an effective strategy for site remediation. The Volunteer implemented the NYSDEC-approved RIWP between November 20 and 29, 2017 in accordance with Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 375, the NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (May 2010), and the NYSDEC Draft BCP Guide (May 2004). A photograph log documenting this investigation is included as Appendix B.

The RI consisted of the following:

- Geophysical survey to identify subsurface anomalies consistent with utilities, substructures, physical obstructions, and USTs, and to pre-clear soil boring locations;
- Advancement of 12 soil borings (16B1 through 16B12), and collection of 35 soil samples, including two field duplicates, and two matrix spike/matrix spike duplicate (MS/MSD) quality assurance/quality control (QA/QC) samples;
- Installation of 3 groundwater monitoring wells and collection of 7 groundwater samples from two existing monitoring wells and three newly installed wells, including one duplicate and one MS/MSD QA/QC samples;
- Implementation of a Community Air Monitoring Program (CAMP); and
- Survey of site monitoring wells for location and elevation relative to NAVD88.

A summary of the samples is provided as Table 1. Sample locations are shown on Figure 5. Each component of the RI is further described in the following sections.

4.1 Utility Mark-out

Prior to beginning of the field investigation, the New York One Call Center was contacted for Code 753 utility mark-outs.

4.2 Geophysical Investigation

A geophysical investigation was implemented by NOVA Geophysical & Environmental, Inc. of Douglaston, New York. The survey used ground-penetrating radar (GPR) to identify potential USTs and locate buried utilities and substructures in the vicinity of each boring location. Borings were relocated as necessary to avoid subsurface utilities and other subsurface impediments. A copy of the geophysical survey report is included in Appendix C.

4.3 Soil Investigation

4.3.1 Investigation Methodology

A total of 12 soil borings (16B1 through 16B12) were advanced by AARCO Environmental Services Corp. (AARCO) between November 20 and 21, 2017. Boring locations were selected to provide sufficient site coverage and to evaluate the AOCs listed in Section 3.4. A direct-push Geoprobe® 6610 DT was used to advance borings to 12 to 15 feet bgs, as summarized below:

- Borings 16B1, 16B2, 16B3 and 16B8 were advanced to about 15 feet bgs to characterize deeper soil which was not previously sampled;
- Borings 16B4, 16B5, and 16B6 were advanced to about 15 feet bgs to further characterize petroleum and chlorinated VOC contamination;
- Boring 16B7 was advanced to about 15 feet bgs to characterize deeper soil in the former benzene UST and gasoline UST area;
- Borings 16B9 through 16B11 were advanced to about 12 feet bgs to characterize non-aqueous phase liquid (NAPL) previously observed in MW3; and
- Boring 16B12 was advanced to about 12 feet bgs to characterize the extent of petroleum-related impacts.

Soil samples were collected continuously from surface grade to the final depth of each environmental boring into 4-foot-long Macro-Core® samplers equipped with acetate liners. Recovered soil was screened for visual, olfactory, and instrumental evidence of environmental impacts and was visually classified for soil type, grain size, color, texture, and moisture content. Instrument screening for the presence of VOCs was performed with a PID equipped with a 10.6 electron volt (eV) lamp. Boring logs documenting these observations are included in Appendix D. Following sample collection, all borings were backfilled with clean soil cuttings.

4.3.2 Sampling Methodology

A total of 35 soil samples (including QA/QC samples) were collected for laboratory analysis in general accordance with the RIWP. Soil sample collection was generally biased toward the intervals with the greatest evidence of environmental impacts (i.e., PID readings above background, staining, chemical/petroleum-like odors). One to four samples were collected at each boring (except for 16B12) to evaluate the AOCs discussed in section 3.4. The table below identifies the borings associated with each AOC.

AOC	Associated Soil Boring
AOC 1 – Historic Fill	16B1 through 16B11
AOC 2 – Petroleum-Related Impacts	16B9, 16B10, 16B11, 16B12
AOC 3 – Chlorinated Solvents	16B4, 16B5, 16B6
AOC 4 – Potential USTs	16B7

Grab samples submitted for VOC analysis were collected directly from the Geoprobe® acetate liner via laboratory-supplied Terra Core® soil sample kits. The sample containers were labeled, placed in a laboratory-supplied cooler, and packed with ice (to maintain a temperature of 4

±2°C). The samples were relinquished, under standard chain-of-custody protocol, to a courier for delivery to Alpha Analytical Laboratories (Alpha), a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory in Westborough, Massachusetts.

Soil samples collected from soil borings 16B1 through 16B8 were analyzed for Target Compound List (TCL)/NYSDEC Part 375 List VOCs + tentatively identified compounds (TICs) by United States Environmental Protection Agency (EPA) Method 8260C, TCL/Part 375 SVOCs + TICs by EPA Method 8270D, and TAL/Part 375 metals by EPA Method 6010C. Samples collected from soil borings 16B9 through 16B11 were analyzed for Total Extractable Petroleum Hydrocarbons (EPH) and Part 375/Priority Pollutants Plus 40 (VOCs, SVOCs, pesticides, herbicides, polychlorinated biphenyls [PCBs], and metals). A sample analysis summary is provided as Table 1.

4.4 Groundwater Investigation

Groundwater monitoring wells were installed and sampled to characterize groundwater conditions and to investigate potential impacts to groundwater associated with the identified AOCs.

4.4.1 Monitoring Well Installation and Development

Three locations in the southeastern corner were drilled to 15 feet bgs and converted into groundwater monitoring wells. The wells were installed with 1-inch diameter schedule 40 pre-pack well screens set to straddle the groundwater table. The screens were set between 5 to 15 feet bgs and solid PVC risers were installed above the screens to extend the well to grade. The annulus of each well was filled with No. 2 sand to about 1 foot above the top of the screen. Hydrated bentonite well seals were installed above the filter sand. Following installation, each well was developed by purging at least 3 well volumes with a check valve. Purged groundwater was stored in one labeled 55-gallon drum and staged on-site pending disposal. The top of casing for each monitoring well was surveyed by Langan on December 29, 2017. Monitoring well construction details are presented in Table 2 and well construction logs are included in Appendix E.

4.4.2 Groundwater Sampling

Monitoring wells were sampled one week after development in accordance with the EPA's low-flow groundwater sampling procedure to allow for collection of a representative sample ("Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells," EQASOP-GW 001, January 19, 2010). Prior to sample collection, synoptic water level and total volatile headspace measurements were collected from RIWP monitoring wells on November 29, 2017. Groundwater elevations are presented in Table 3. A groundwater contour map is presented as Figure 7.

Following the gauging event, groundwater was purged from each well until groundwater parameters (pH, conductivity, turbidity, dissolved oxygen (DO), temperature, turbidity, and oxidation-reduction potential [ORP]) had stabilized. At least three well casing volumes were purged from each well before samples were collected using a peristaltic pump and dedicated polyethylene tubing.

Seven groundwater samples were collected (one from each of the three newly installed wells [16MW1, 16MW2, and 16MW3], one from existing wells MW3 and MW4, plus one duplicate, and one MS/MSD). Samples were collected into laboratory-supplied glassware and delivered via courier service to Alpha for analysis of TCL/Part 375 VOCs + TICS by EPA Method 8260C, TCL/Part 375 SVOCs + TICS by EPA method 8270D, and TAL/Part 375 metals (total and dissolved) by EPA methods 6010C. Groundwater sampling logs are included in Appendix E.

4.5 Quality Assurance/Quality Control Sampling

Trip blanks, field duplicate samples, and MS/MSD samples were collected and submitted for laboratory analysis for QA/QC purposes; these samples are detailed in Table 1. Matrix-specific QA/QC samples that were collected for the RI are summarized below:

Soil QA/QC Samples

- Two field duplicate samples;
- Two MS/MSD samples; and
- Three trip blanks.

Groundwater QA/QC Samples

- One field duplicate samples;
- One MS/MSD samples; and
- One trip blank.

MS/MSD samples were collected to assess the effect of the sample matrix on the recovery of target compounds or target analytes.

Field duplicate samples were collected to assess the precision of the analytical methods relative to the sample matrix. The duplicates were collected from the same material as the primary sample by splitting the volume of homogenized sample collected in the field into two sample containers.

Trip blank samples were collected to assess the potential for contamination of the sample containers and samples during transport from the laboratory, to the field, and back to the laboratory for analysis. Trip blanks contain about 40 milliliters of acidic water (doped with hydrochloric acid) that is prepared and sealed by the laboratory when the empty sample containers are shipped to the field, and then unsealed and analyzed for VOCs by the laboratory when the sample shipment is received from the field.

4.6 Data Validation

Analytical data was validated by a Langan validator in accordance with EPA and NYSDEC validation protocols. Copies of the data usability summary reports (DUSRs) and the data validator’s credentials are provided in Appendix G.

4.6.1 Data Usability Summary Report Preparation

A DUSR was prepared for each sampling matrix. The DUSR presents 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. For the soil and groundwater samples, the following items were assessed:

- Hold times
- Sample preservation
- Sample extraction and digestion
- Laboratory blanks
- Laboratory control samples
- System monitoring compounds
- MS/MSD recoveries
- Field duplicate, trip blank, and field blank sample results

Based on the results of data validation, the following qualifiers may be assigned to the data in accordance with the EPA’s guidelines and best professional judgment:

- “U” – The analyte was analyzed for but was not detected at a level greater than or equal to the reporting limit (RL) or the sample concentration or the sample concentration for results impacted by blank contamination.
- “UJ” – The analyte was not detected at a level greater than or equal to the RL; however, the reported RL is approximate and may be inaccurate or imprecise.
- “J” – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
- “R” – The sample results are not useable due to quality of the data generated because certain criteria were not met. The analyte may and may not be present in the sample.

After data validation activities were complete, validated data was used to prepare the tables and figures included in this report.

4.7 Field Equipment Decontamination

Down-hole drilling equipment was decontaminated between each boring. Down-hole drilling equipment was rinsed with an Alconox®-based solution. Decontamination wastewater was placed into 55-gallon drums for disposal.

4.8 Investigation-Derived Waste Management

Investigation derived waste (IDW) generated during the RI was properly handled and containerized. Groundwater from monitoring well development and purging, and decontamination water were placed into UN/DOT-approved 55-gallon steel drums with sealed tops. Drill cuttings exhibiting no evidence of chemical or petroleum impacts were used to backfill soil borings. One groundwater drum was staged in a secured area on-site pending transport by a licensed waste hauler for disposal at an approved facility.

4.9 Community Air Monitoring Program

A Community Air Monitoring Plan (CAMP) was implemented during each day of environmental drilling, on November 20 and 21, 2017. The CAMP was developed to monitor potential exposure to off-site receptors, including residences and businesses, from potential airborne contaminant releases during intrusive field activities. The CAMP consisted of real-time monitoring for VOCs and particulates (i.e., dust) at upwind and downwind locations to the works.

Instruments

Continuous dust and VOC monitoring was conducted using one upwind and one downwind monitoring station at the site perimeter. Each monitoring station included a TSI DustTrak II aerosol monitor for measuring particulates with an aerodynamic diameter less than 10 micrometers (PM10), and a MiniRAE® 3000 PID for measuring total VOCs. The work zone and site perimeter were visually monitored for fugitive dust emissions.

Action Levels

Action levels used to monitor community and visitor exposure were set forth in the CAMP included in the CHASP (Appendix D in the RAWP) and are summarized as:

- Particulate Action Level: 100 micrograms of dust per cubic meter of air (μg/m3) above background for a 15-minute average
- VOC Action Level: 25 parts per million (ppm) for instantaneous readings above background or 5 ppm above background for a 15-minute average.

Aerosol monitors and PIDs recorded measurements on a continuous basis during remediation and construction activities. Fifteen-minute running averages were calculated from the recorded data, and averages were compared to the action levels specified above. CAMP summary data is included as Appendix F.

5.0 FIELD OBSERVATIONS AND ANALYTICAL RESULTS

5.1 Geophysical Investigation Findings

The majority of identified anomalies were consistent with utilities (i.e. electric, gas, sewer line and water line). One large anomaly, consistent with a potential UST, was identified in the northwestern corner of the site. Historical records also indicate that there may be USTs in the western portion of the site. A copy of the November 2017 geophysical report is included in Appendix C.

5.2 Geology and Hydrogeology

Provided below is a description of the geologic and hydrogeologic observations made during the RI. A groundwater contour map is included as Figure 6, cross-sectional diagrams showing inferred soil profiles are shown on Figure 7, and soil boring logs are provided in Appendix D.

5.2.1 Historic Fill

The site is underlain by a layer of historic fill ranging in depth from about 6 feet bgs (16B5) to 11.5 feet bgs (16B8) and predominately consisting of brown fine- to medium-grained sand with varying amounts of gravel, brick, concrete, asphalt, silt, glass, wood, organics, coal fragments and slag. An about 1.5-foot void was encountered underneath the northern building slab during advancement of soil boring 16B2. The void was also observed in three exploratory offsets, spaced about 5 feet around the original boring location.

5.2.2 Native Soil Layers

The fill layer is underlain by olive, fine-grained silty sand and grey organic clay with varying amounts of gravel, organics, and shells. Underlying the silty sand is an interval of soft, grey clay with varying amounts of organics and shells. This stratigraphy was generally consistent across the site.

5.2.3 Bedrock

The USGS "Bedrock and Engineering Geologic Maps of New York County and Parts Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey" indicates that the bedrock underlying the site is part of the Hartland Formation. Bedrock was not encountered during this RI. A November 2017 geotechnical investigation, which included advancement of soil borings to 100 feet bgs, did not encounter bedrock.

5.2.4 Hydrogeology

Synoptic groundwater level measurements were collected on November 29, 2017 from five monitoring wells (MW3, MW4, 16MW1, 16MW2, and 16MW3), and on January 2, 2018 from seven wells (MW1, MW2, MW3, MW4, 16MW1, 16MW2, and 16MW3). Water level ranged between about el. 0.76 and el. 2.78 NAVD88. Based on the well gauging results, groundwater appears to flow west towards the East River. A map showing groundwater contours and the inferred flow direction is provided as Figure 6. Groundwater elevations are shown in Table 3.

5.3 Soil Findings

5.3.1 Field Observations

Petroleum-like impacts, evidenced by odors, staining, and/or PID readings above background levels were observed at similar depths in six of the twelve soil borings. The depth intervals at which petroleum impacts were apparent with the highest recorded PID readings are provided in the following table:

Soil Boring ID	Depth Interval of Observed Impacts (feet bgs)	Max PID Reading (ppm)	Soil Boring Location
16B1	7 to 13	103.7 (7 to 8 feet bgs)	Central
16B2	11 to 12	16.1 (11 to 12 feet	North-central
16B3	7 to 8	634.1 (7 to 8 feet bgs)	Northeast
16B7	7 to 8	388.2 (7 to 8 feet bgs)	Southwest
16B9	7 to 10.5	61.5 (10 to 11 feet	Central
16B10	7 to 8	54.6 (7 to 8 feet bgs)	Central

5.3.2 Analytical Results

A summary of laboratory detections for soil samples collected during the RI with comparisons to NYSDEC Part 375 UU SCOs and RURR SCOs is provided in Tables 4A and 4B. Laboratory analytical data reports are included in Appendix H. Soil sample results that exceed UU and RURR SCOs for samples collected during previous environmental investigation and the RI are shown on Figure 8.

The following sections present a summary of concentrations that exceeded their respective UU and/or RURR SCOs, organized by analytical parameter set:

VOCs

Petroleum-related and chlorinated VOCs were detected in soil at concentrations above 6 NYCRR Part 375 UU SCOs at depths ranging from 0 to 8 feet bgs and in localized areas up to 12 feet bgs. VOC concentrations above RURR SCOs were identified up to 8 feet bgs in three soil samples located within the northern portion of the site (16B1, 16B3, and 16B8). The table below provides a summary of low and high range VOC concentrations that were detected above their respective 6 NYCRR Part 375 UU SCOs. VOC concentrations that were also detected above RURR SCOs are shown in bold.

Parameter	Range of Concentrations Detected above SCO		UU and RURR SCOs
	Low	High	
1,2,4-Trimethylbenzene	6.2 mg/kg in 16B3_7-8	8.7 mg/kg in 16B1_7-8	UU: 3.6 mg/kg RURR: 52 mg/kg
2-Butanone	0.78 mg/kg in 16B3_0-2	1.4 mg/kg in 16B3_7-8 and 16B8_5.5-6.5	UU: 0.12 mg/kg RURR: 100 mg/kg
Acetone*	0.051 mg/kg in 16B4_11-12	0.23 mg/kg in 16B3_0-2	UU: 0.05 mg/kg RURR: 100 mg/kg
cis-1,2-Dichloroethene	0.26 mg/kg in 16B8_11-12	16 mg/kg in 16B3_7-8	UU: 0.25 mg/kg RURR:100 mg/kg
Naphthalene	13 mg/kg in 16B1_7-8		UU: 12 mg/kg RURR: 100 mg/kg
Tetrachloroethene	2.3 mg/kg in 16B8_0-2	5.7 mg/kg in 16B5_4.5-5	UU: 1.3 mg/kg RURR: 19 mg/kg
trans-1,2-Dichloroethene	1.1 mg/kg in 16B3_7-8		UU: 0.19 mg/kg RURR: 100 mg/kg
Trichloroethene	0.51 mg/kg in 16B10_7-8	**30 mg/kg** in 16B1_0-2	UU: 0.47 mg/kg RURR: 21 mg/kg
Vinyl chloride	0.57 mg/kg in 16B10_7-8	**1.6 mg/kg** in 16B3_7-8	UU: 0.02 mg/kg RURR: 0.9 mg/kg
Xylenes, Total	0.49 mg/kg in 16B8_0-2	7.2 mg/kg in 16B3_0-2	UU: 0.26 mg/kg RURR: 100 mg/kg

*Acetone is a common laboratory contaminant and therefore, its presence in soil results is not likely representative of site conditions.

SVOCs

Nine SVOCs were detected in soil at concentrations above 6 NYCRR Part 375 UU at depths ranging from 0 to 8 feet bgs throughout the site and in one location (16B8) at a depth up to 15 feet bgs. SVOCs in soil detected at concentrations above RURR SCOs were identified up to at least 8 feet bgs in borings 16B2 and 16B3, and up to 15 feet bgs in boring 16B8. The table below provides a summary of low and high range SVOC concentrations that were detected above their respective 6 NYCRR Part 375 UU SCOs. SVOC concentrations that were also detected above RURR SCOs are shown in bold.

Parameter	Range of Concentrations Detected above SCO		UU and RURR SCOs
	Low	High	
3-Methylphenol/ 4-Methylphenol	0.38 mg/kg in 16B8_11-12	2.7 mg/kg in 16B10_7-8	UU: 0.33 mg/kg RURR: 100 mg/kg
Benzo(a)anthracene	**1.2 mg/kg** in 16B1_0-2 and SODUP02_112119	**5.4 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR: 1 mg/kg
Benzo(a)pyrene	**1.1 mg/kg** in SODUP02_112117	**5.1 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR:1 mg/kg
Benzo(b)fluoranthene	**1.1 mg/kg** in 16B6_3-4 and 16B8_11-12	**6.5 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR: 1 mg/kg
Benzo(k)fluoranthene	1.3 mg/kg in 16B3_7-8	2.1 mg/kg in 16B2_7-8	UU: 0.8 mg/kg RURR: 3.9 mg/kg
Chrysene	1.2 mg/kg in 16B1_0-2, 16B1_7-8 and SODUP02_112117*	**5.3 mg/kg** in 16B2_7-8	UU: 1 mg/kg RURR: 3.9 mg/kg
Dibenzo(a,h)anthracene	**0.35 mg/kg** in 16B8_14-15	**0.69 mg/kg** in 16B2_7-8	UU: 0.33 mg/kg RURR: 0.33 mg/kg
Indeno(1,2,3-cd)pyrene	**0.51 mg/kg** in 16B3_0-2	**3.2 mg/kg** in 16B2_7-8	UU: 0.5 mg/kg RURR: 0.5 mg/kg
Phenol	0.44 mg/kg in 16B10_7-8		UU: 0.33 mg/kg RURR: 100 mg/kg

*SUDUP02_112117 is a duplicate of the parent sample 16B4_3-4.

Pesticides, Herbicides, and PCBs

Per the approved RIWP, only soil samples collected from borings 16B9 through 16B11 were analyzed for pesticides, herbicides, and PCBs. Herbicides and PCBs were not detected. One pesticide, 4,4’-DDT, was detected above 6 NYCRR UU, but below RURR SCOs in the 7- to 8-foot interval of soil boring 16B10.

A site-wide waste characterization will be completed to classify soil prior to excavation for foundation construction and will include analysis of pesticides, herbicides, and PCBs.

Metals

Metals were detected at concentrations above their respective 6 NYCRR Part 375 UU and RURR SCOs in all sampled soil borings, and extending up to 15 feet in borings 16B4 and 16B8. Borings 16B4 and 16B8 also contained metals at concentrations above Part 375 RURR SCOs up to 15 feet bgs. The highest concentrations appear to be located within the historic fill layer and generally begin to diminish with depth. The following table provides a summary of low and high range metal concentrations that were detected above their respective Part 375 UU SCOs. Metals concentrations that were also detected above RURR SCOs are shown in bold.

Parameter	Range of Concentrations Detected above SCO		UU and RURR SCOs
	Low	High	
Arsenic	19.2 mg/kg in 16B1_7-8	**117 mg/kg** in 16B9_10-11	UU: 0.33 mg/kg RURR: 100 mg/kg
Barium	370 mg/kg in SODUP02_112117*	**672 mg/kg** in 16B3_0-2	UU: 350 mg/kg RURR: 400 mg/kg
Cadmium	2.66 mg/kg in 16B2_13-14	**37.2 mg/kg** in 16B1_7-8	UU: 2.5 mg/kg RURR: 4.3 mg/kg
Chromium, Hexavalent	1.2 mg/kg in 16B9_10-11	1.5 mg/kg in SODUP01_112017 (duplicate of 16B5_12-13)	UU: 1 mg/kg RURR: 110 mg/kg
Chromium, Trivalent	34 mg/kg in 16B8_14-15	**2,400 mg/kg** in 16B7_6.5-7.5	UU: 30 mg/kg RURR:180 mg/kg
Copper	51.7 mg/kg in 16B4_3-4	**1,250 mg/kg** in 16B3_7-8	UU: 50 mg/kg RURR: 270 mg/kg
Lead	96.2 mg/kg in 16B4_11-12	**9,410 mg/kg** in 16B9_10-11	UU: 63 mg/kg RURR: 400 mg/kg
Mercury	0.45 mg/kg in 16B5_12-13	**160 mg/kg** in 16B3_7-8	UU: 0.18 mg/kg RURR: 0.81mg/kg
Nickel	32 mg/kg in 16B6_3-4	295 mg/kg in 16B1_7-8	UU: 30 mg/kg RURR: 310 mg/kg
Selenium	0.21 mg/kg in 16B8_5.5-6.5	6.7 mg/kg in 16B1_7-8	UU: 3.9 mg/kg RURR: 180 mg/kg
Silver	3.69 mg/kg in 16B8_11-12	57.8 mg/kg in 16B5_4.5-5	UU: 2 mg/kg RURR: 180 mg/kg
Zinc	126 mg/kg in 16B2_11-12	**7,990 mg/kg** in 16B2_7-8	UU: 109 mg/kg RURR: 1000 mg/kg

*SODUP02_112117 is a duplicate of the parent sample 16B4_3-4.

5.4 Groundwater Findings

5.4.1 Field Observations

All monitoring wells sampled during the RI were first gauged for the presence of free product (i.e., light, non-aqueous phase liquid (LNAPL) with an oil-water interface probe. Free product was not detected; however, petroleum-like odors were observed in purged groundwater generated from MW3. Monitoring well headspace PID measurements ranged from 0.0 to 4.8 ppm (highest reading in 16MW2) during sampling.

Existing monitoring well MW4, from EBC's Phase II ESI, was found without a cover, damaged, and covered with overgrown vegetation. After removing the surface vegetation and cave-in debris, groundwater was detected within the monitoring well.

5.4.2 Analytical Results

A summary of the groundwater sample laboratory detections compared to TOGS Class GA SGVs is presented in Tables 5. Groundwater sample locations and results that exceed their respective TOGS Class GA SGVs are presented on Figure 9. Laboratory analytical data reports are included in Appendix H.

The following is a summary of groundwater sample results from the RI that exceed the TOGS SGVs organized by analytical parameter set:

VOCs

Four VOCs were detected in groundwater at concentrations above their respective TOGS Class GA SGVs throughout the site. The following table provides low and high range concentrations of VOCs detected above their respective TOGS Class GA SGVs.

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
cis-1,2-Dichloroethene	8.6 μg/L in 16MW3	40 μg/L in MW4	5 μg/L
Naphthalene	17 μg/L in 16MW1		10 μg/L
Trichloroethene	5.5 μg/L in GWDUP01	21 μg/L in 16MW3	5 μg/L
Vinyl chloride	4 μg/L in MW4	5.1 μg/L in MW3	2 μg/L

*GWDUP01 is a duplicate of the parent sample from monitoring well 16MW2.

SVOCs

Groundwater samples collected from 16MW1, 16MW2 and 16MW3 contained one or more SVOCs at concentrations above their respective TOGS Class GA SGVs. The following table provides low and high range concentrations of SVOCs detected above their respective TOGS Class GA SGVs.

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
Benzo(a)anthracene	0.03 μg/L in 16MW1	0.45 μg/L in 16MW3	0.002 μg/L
Benzo(a)pyrene	0.41 μg/L in 16MW3		0.002 μg/L
Benzo(b)fluoranthene	0.02 μg/L in 16MW1	0.6 μg/L in 16MW3	0.002 μg/L
Benzo(k)fluoranthene	0.2 μg/L in 16MW3		0.002 μg/L
Bis(2-chloroethyl)ether	2 μg/L in MW3, MW4, 16MW1, 16MW2, and		1 μg/L

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
	16MW3		
Chrysene	0.05 µg/L in16MW2	0.48 µg/L in 16MW3	0.002 µg/L
Hexachlorocyclopentadiene	20 µg/L in MW3, MW4, 16MW1, 16MW2, and 16MW3		5 µg/L
Indeno(1,2,3-cd)pyrene	0.39 µg/L in 16MW3		0.002 µg/L

Total Metals

Eight total metals were detected in groundwater at concentrations above their respective TOGS Class GA SGVs. The following table provides low and high range concentrations of metals detected above their respective TOGS Class GA SGVs:

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
Arsenic	120.6 µg/L in MW4		25 µg/L
Iron	2,760 µg/L in 16MW1	26,100 µg/L in MW4	300 µg/L
Lead	53.44 µg/L in 16MW3	359 µg/L in GWDUP01*	25 µg/L
Manganese	346.8 µg/L in MW4	576.8 µg/L in 16MW1	300 µg/L
Mercury	7.3 µg/L in 16MW2	20.05 µg/L in GWDUP01*	0.7 µg/L
Nickel	136.9 µg/L in 16MW3		100 µg/L
Sodium	25,200 µg/L in 16MW3	69,700 µg/L in GWDUP01*	20,000 µg/L
Zinc	3,294 µg/L in 16MW3		20,000 µg/L

*GWDUP01 is a duplicate of the parent sample from monitoring well 16MW2.

Dissolved Metals

Six dissolved metals were detected in groundwater at concentrations above their respective TOGS Class GA SGVs across the site. The following table provides low and high range concentrations of dissolved metals detected above their respective TOGS Class GA SGVs:

Parameter	Range of Concentrations Detected above TOGS Class GA SGV		TOGS Class GA SGV
	Low	High	
Arsenic	112.1 µg/L in MW4		25 µg/L
Iron	2,830 µg/L in 16MW1	20,400 µg/L in MW4	300 µg/L

Manganese	338.2 μg/L in MW4	569.2 μg/L in 16MW1	300 μg/L
Nickel	135.6 μg/L in 16MW3		100 μg/L
Sodium	23,400 μg/L in 16MW3	62,500 μg/L in GWDUP01	20,000 μg/L
Zinc	3,236 μg/L in 16MW3		20,000 μg/L

5.5 QA/QC Sample Results

Duplicate and trip blank samples collected during the RI are detailed in Table 1 and MS/MSD sample results are summarized in the laboratory reports. Duplicate and MS/MSD samples were collected at a frequency of 1 per 20 primary samples. QA/QC samples results were also evaluated as part of data validation. Analytical results for trip blank samples are summarized in Table 7.

5.6 Data Usability

Category B laboratory reports for all the collected soil and groundwater samples were provided by Alpha and were forwarded to Langan's data validator. Copies of the DUSRs are provided in Appendix G. The results of the data validation review are summarized below.

Major deficiencies were identified include:

- 2-chloroethylvinyl ether was submitted to the laboratory as preserved; however, it is an acid-labile compound that will not recover in the presence of hydrochloric acid. The associated trip blank sample results were qualified as "R" for unusable.

With the exception of 2-chloroethylvinyl ether, the data was determined to be acceptable and usable as qualified.

5.7 Evaluation of Potential Areas of Concern

The goal of the RI was to evaluate the AOCs described in Section 3.4. This section discusses the results of the RI with respect to the AOCs.

5.7.1 AOC-1: Historic Fill

Historic fill was identified in all borings extending to depths from 6 feet bgs (16B2) to about 11.5 feet bgs (16B8). Contaminants typically associated with historic fill in soil and groundwater include SVOCs, pesticides, PCBs, and metals.

Findings Summary

Soil

Historic fill generally consisted of brown, fine to medium sand with varying amounts of gravel, brick, concrete, asphalt, silt, glass, organics, wood, coal fragments, and slag. Thirteen samples were collected from the historic fill layer. Sample results from historic fill are summarized as follows:

- VOCs (2-butanone acetone, cis-1,2,-dichloroethene, naphthalene, PCE, TCE, trans-1,2-dichloroethene, vinyl chloride and total xylenes) were detected at concentrations exceeding their respective UU and/or RURR SCOs across eight soil borings (16B1, 16B3, 16B4, 16B5, 16B6, 16B7, 16B8 and 16B10). With the exception of acetone, these detections are likely related to releases associated with the historical use of petroleum products and chlorinated solvents at the site or at surrounding sites or the general quality of the fill placed at the site. Acetone is a common laboratory contaminant and is likely not representative of the soil conditions.

- SVOCs were detected at concentrations exceeding their respective UU SCOs (3-methylphenol/4-methylphenol, benzo(k)fluoranthene, and phenol) and RURR SCOs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene) across soil borings 16B1, 16B3, 16B4, 16B5, 16B6, 16B7, 16B8 and 16B10.
- Metals were detected at concentrations exceeding their respective UU SCOs (arsenic, barium, cadmium, hexavalent and trivalent chromium, copper, lead, mercury, nickel, selenium, silver, and zinc) and RURR SCOs (arsenic, barium, cadmium, trivalent chromium, copper, lead, and mercury) across samples collected from the historic fill layer.
- The pesticide 4,4′-DDT was detected above UU SCOs in one sample (16B10_7-8).
- Total PCBs and herbicides were not detected above UU SCOs in any samples.

Groundwater

Several SVOCs were detected a concentrations above TOGS Class GA SGVs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-chloroethyl)ether chrysene, hexachlorocyclopentadiene, and indeno(1,2,3-cd)pyrene. Total and dissolved arsenic was detected at a concentration exceeding its TOGS Class GA SGV in the groundwater sample collected from MW4 (maximum of 120.6 µg/L in MW4_112917). Other detected metals, including iron, manganese, nickel, sodium and zinc, are considered naturally occurring elements.

Soil Vapor

Historic fill does not appear to have contributed to soil vapor contamination at the site.

Conclusions

Historic fill was identified across the site from surface grade to depths up to about 11.5 feet bgs. VOCs, SVOCs, and metals were detected above both UU and RURR SCOs in the historic fill. Petroleum-related and chlorinated VOCs were detected in soil samples collected from the east-central portion of the site and the detected concentrations are likely due to the historical use of petroleum products and chlorinated solvents at the site or at surrounding sites or the general quality of the fill placed at the site. Similar compounds detected in soil were also reflected in the groundwater at concentrations above TOGS Class GA SGVs.

5.7.2 AOC-2: Petroleum-Related Impacts in Soil and Groundwater

Petroleum-related impacts were detected in soil at concentrations exceeding UU and/or RURR SCOs during EBC's 2015 Phase II ESI. Similar soil conditions were identified from 0 to 8 feet in three of the eleven RI borings. Two groundwater samples from EBCs Phase II contained petroleum-related VOCs at concentrations about one to two orders of magnitude above their respective TOGS Class GA SGVs.

Findings Summary

Soil

Two petroleum-related VOCs, naphthalene and total xylenes, were detected at concentrations exceeding UU SCOs in three soil borings (16B1, 16B3, and 16B8), generally located in the central portion of the site. Several borings, including 16B1, 16B2, 16B3, and 16B7, contained elevated PID readings, staining, and petroleum-like odors. Additionally, gross impacts were observed in soil boring 16B1 consisting of product and/or stained soil with petroleum-like odors from about 7 to 13.5 feet bgs.

Groundwater

Analytical results identified petroleum-related impacts to groundwater in the central and eastern portions of the site. Naphthalene was detected above its TOGS Class GA SGV in monitoring wells MW3 and 16MW1 during EBC's 2015 Phase II ESI and Langan's 2017 RI, respectively. Sample MW3 exhibited the maximum naphthalene concentration of 31 µg/L, followed by 16MW1_11297 with a concentration of 17 µg/L.

Conclusions

Based on the analytical results and field observations, petroleum-related impacts are localized to the shallow subsurface (less than 15 feet bgs), typically around the groundwater interface and in groundwater primarily in the central and eastern portions of the site. Target compound concentrations in groundwater are highest in wells that are hydraulically up-gradient to the historical on-site USTs, suggesting that contamination is potentially due to the historical use of petroleum products at the site or from off-site sources migrating onto the site. In general, impacts were not observed to extend into the organic clay layer with the exception of soil boring 16B1. Impacts were not observed at the termination of boring 16B1 (15 feet bgs).

5.7.3 AOC-3: CVOCs in Soil, Groundwater, and Soil Vapor

CVOC impacts were detected at concentrations in soil exceeding UU and/or RURR SCOs, in groundwater exceeding TOGS Class GA SGVs, and in soil vapor above the NYSDOH Decision Matrices for recommended "mitigation" during EBC's Phase II ESI. Similar soil impacts were identified in seven of the eleven RI borings.

Findings Summary

Soil

TCE and vinyl chloride were detected in soil at concentrations exceeding RURR SCOs at borings 16B1, 16B2, and 16B8, located in the central portion of the site. TCE and cis-1,2-dichloroethene were detected at concentrations above UU SCOs in RI borings 16B3, 16B5, 16B6, 16B8, and 16B10.

Groundwater

Analytical results from the RI identified CVOC impacts to groundwater in the central and eastern portion of the site. Four of the five groundwater samples contained CVOCs at concentrations that were one to two orders of magnitude above their respective TOGS Class GA SGVs. Concentrations of TCE, cis-1,2-dichloroethene, and vinyl chloride exceeding their respective TOGS Class GA SGVs were found in samples collected from MW3, MW4, 16MW1, 16MW2 and 16MW3. Maximum RI concentrations of TCE (21µg/L) and cis-1,2-dichloroethene (40 µg/L) were detected in monitoring wells 16M3 and MW4, respectively. These compounds were also detected during EBC’s Phase II ESI at 170 µg/L and 30 µg/L, respectively.

Soil Vapor

According EBC’s Phase II ESI, total CVOC concentrations in soil vapor samples ranged from 206 µg/m^3 at SG-6, located in the south-central portion of the site, to 261,616 µg/m^3 at SG-4, located in the central portion of the site. Soil vapor sample locations and analytical results are shown on Figure 10.

Conclusions

Based on analytical results from previous environmental investigations and the RI, concentrations of CVOCs in soil are primarily in the historic fill layer located in the central and eastern portions of the site. When comparing groundwater data from the 2015 Phase II to the 2017 RI, CVOCs appear to be following the reductive dechlorination pathway, as concentrations of TCE have decreased while cis-1,2-dichloroethene increased between sampling events. Impacts to soil vapor are present at concentrations that will require mitigation according to NYSDOH guidance.

5.7.4 AOC-4: Potential Underground Storage Tank (UST):

Potential gasoline and other chemical USTs were identified in the western portion of the site by the 1942 Certified Sanborn Map. The USTs were no long depicted on the subsequent 1951 Sanborn Map and closure records were not available for review. A soil vapor sample collected during EBC’s 2015 Phase II ESI indicated the presence of petroleum-related VOCs in the western portion of the site.

<u>*Findings Summary*</u>

Geophysical Survey

The geophysical survey identified a large anomaly, potentially consistent with a UST, in the northwestern portion of the site. The location of this UST was not shown on available Sanborn Maps and there are no known records documenting its contents or closure.

Soil

PID readings up to 388.2 ppm and odors were observed during the RI in boring 16B7 from about 6.5 to 7.5 feet bgs, in the vicinity of the USTs identified on the 1942 Sanborn Map. Samples collected in this area from soil borings B6 and B10 during EBC's Phase II ESI exhibited concentrations of petroleum-related VOCs exceeding UU SCOs.

Groundwater

A groundwater sample collected from MW2 during EBC's Phase II ESI detected the presence of methyl tert-butyl ether (MTBE), but at a concentration below its TOGS Class GA SGV. Naphthalene was detected in up-gradient wells at concentrations that exceed TOGS Class GA SGVs suggesting that contamination is due to the historical use of petroleum products at the site or from off-site sources migrating onto the site.

<u>*Conclusions*</u>

The geophysical survey conducted during this RI identified an anomaly consistent with a potential UST in the northwestern portion of the site, where no tanks were shown on available Sanborn Maps. The 1942 Sanborn Map identified three USTs in the southwestern corner of the site, which were reported closed. EBC's 2015 Phase II ESI identified petroleum impacts in the surrounding soil; however soil; however, analytical results from the 2017 RI did not identify similar petroleum-related impacts to soil or groundwater media in the vicinity of the potential USTs. Petroleum impacts appear to be localized in the east-central portion of the site.

6.0 QUALITATIVE HUMAN AND FISH/WILDLIFE EXPOSURE ASSESSMENT

Human health exposure risk was evaluated for both current and future site and off-site conditions, in accordance with the May 2010 NYSDEC Final DER-10 Technical Guidance for Site Investigation and Remediation. The assessment includes an evaluation of potential sources and migration pathways of site contamination, potential receptors, exposure media, and receptor intake routes and exposure pathways.

In addition to the human health exposure assessment, NYSDEC DER-10 requires an on-site and off-site Fish and Wildlife Resources Impact Analysis (FWRIA) if certain criteria are met. Based on the requirements stipulated in Section 3.10 and Appendix 3C of DER-10, there was no need to prepare an FWRIA for the site. A completed copy of the DER-10 Appendix 3C decision key is included as Appendix I.

6.1 Current Conditions

The site is currently improved with two single-story industrial buildings and two smaller one-story structures, which are surrounding by asphalt on the west and vegetation-covered areas on the east. One of the single-story buildings was formerly occupied by Brooklyn Moto Club and Brooklyn Moto Service LLC as a motorcycle repair shop but at the time of this report all site buildings are vacant.

6.2 Proposed Conditions

The conceptual development plan consists of a new seven-story mixed-use commercial and residential building with cellar-level parking, ground-level retail space, and an elevated rear yard in the northwest part of the second floor. Soil excavation to about 18.5 feet bgs and dewatering is anticipated to facilitate foundation construction.

6.3 Conceptual Site Model

A conceptual site model (CSM) was developed based on the findings of the RI and previous investigations to produce a simplified framework for understanding the distribution of impacted materials, potential migration pathways, and potentially complete exposure pathways, as discussed below.

6.3.1 Potential Sources of Contamination

Potential sources of contamination have been identified and include historic fill, petroleum bulk storage, and historical use of the site and surrounding properties. The site-wide presence of historic fill has been established as a source of SVOCs, pesticides, and metals in soil. Historical petroleum bulk storage has been established as a potential source of petroleum-related VOCs and SVOCs in soil, groundwater, and soil vapor. Historical site uses as an automobile repair facility and varnish factory have been established as a potential source of CVOC impacts to soil, groundwater, and soil vapor. The use of adjacent and surrounding properties for industrial and commercial uses is a potential source for petroleum and CVOC contamination. Prior to site development, there exists the potential for groundwater and soil vapor to migrate off-site and to affect the adjacent property. The following air sampling program will be implemented during the 45-day RAWP public comment period:

- The volunteer commits to contacting owners of the adjacent residential building to the north (214 North 11th Street) to request access and, where feasible, to conduct sub-slab soil vapor and indoor air sampling (three paired indoor air and sub-slab vapor samples). Sub-slab soil vapor sampling would not be feasible if the bottom of the building slab is at or below the water table. If the slab is below the water table and the adjoining building owner allows sampling, three indoor air samples will be collected. The adjacent building to the west is a ventilated parking garage and soil vapor intrusion is not a concern.
- The volunteer commits to collecting three sidewalk soil vapor samples to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

6.3.2 Exposure Media

Impacted media include soil, groundwater, and soil vapor. Analytical data from the RI and previous investigations indicates the historic fill material across the site contains SVOCs, pesticides, and metals. Groundwater impacts include VOCs, SVOCs, and metals. Soil vapor is impacted with both petroleum-related and CVOCs.

6.3.3 Receptor Populations

The site is currently vacant with restricted access to authorized guests and the project development team. Prior to site development, there exists the potential for groundwater and soil vapor to migrate offsite and potentially to affect the adjacent property. As discussed above, the volunteer commits to contacting owners of the adjacent residential building to the north to gain access and, where feasible, conduct sub-slab soil vapor and indoor air sampling. In addition, three sidewalk soil vapor samples will be collected to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

During site development human receptors are limited to construction and remediation workers, authorized guests visiting the site and the public adjacent to the site. Upon completion of removal of impacted soils to below the groundwater table, post-excavation sampling will be used to determine whether there is remaining risk of site-related soil vapor contamination beyond the site boundaries. If it is determined that there is a risk of impacts beyond the site boundaries, a risk assessment will be undertaken to define such risks. Such evaluation will take into consideration the removal of site soil to below the groundwater table and installation of the lowest-level slab below the groundwater table. Under future conditions, receptors will include the new and renovated building occupants, workers, and visitors to the residential property, including children.

6.4 Potential Exposure Pathways – On-Site

6.4.1 Current Conditions

Soil at the site has been shown to be contaminated. The site surface cover is composed of concrete (building slab), asphalt parking, and vegetation. There is a potential exposure pathway in vegetated areas or if the site surface cover is penetrated (e.g., during site investigation when borings or test pit excavation are performed). The potential pathway is through dermal absorption, inhalation and ingestion.

Groundwater at the site has been shown to be contaminated. Groundwater in this area of New York City is not used as a potable water source. There is a potential exposure pathway during groundwater sampling associated with site investigation. The potential pathway is through dermal absorption, inhalation and ingestion. Activity is limited to trained investigation personnel.

Soil vapor at the site has been shown to be contaminated. There is a potential exposure pathway during soil vapor sampling associated with site investigation and intrusion through potential cracks in the building slab. The potential pathway is through inhalation.

6.4.2 Construction/Remediation Condition

Construction and remediation activities will be performed in accordance with a HASP and CAMP. The implementation of these programs, as well as vapor and dust suppression techniques, limit the exposure pathways presented by potential dermal absorption, ingestion, and inhalation.

6.5 Potential Exposure Pathways – Off-Site

Contaminated soil has the potential to be transported off-site by wind in the form of dust or on the tires of vehicles or equipment leaving the site during development and create an exposure risk to the public adjacent to the site. Groundwater is anticipated to flow west, and groundwater samples collected from wells on the southern and most western side of the site indicate volatile contaminants are not migrating off site. Metal impacts to groundwater are considered a regional problem and are not considered a localized concern.

Prior to site development, there exists the potential for soil vapor intrusion into neighboring buildings. However, exposure is expected to be limited by the following:

- The west-adjoining building is an open-air parking garage with natural air ventilation. The open ventilated parking garage prevents the potential for a soil vapor intrusion issue.
- The north-adjoining building was observed during the 2017 Geotechnical Engineering Study to have a waterproofed foundation that extended below the groundwater table. A

foundation set below the groundwater table blocks the migrations or accumulation of soil vapor, which prevents the potential for a soil vapor intrusion issue.

Further, the volunteer commits to contacting owners of the adjacent residential building to the north (214 North 11th Street) to request access and, where feasible, to conduct sub-slab soil vapor and indoor air sampling (three paired indoor air and sub-slab vapor samples). Sub-slab soil vapor sampling would not be feasible if the bottom of the building slab is at or below the water table. If the slab is below the water table and the adjoining building owner allows sampling, three indoor air samples will be collected. The adjoining building to the west is a ventilated parking garage and soil vapor intrusion is not a concern. In addition, three sidewalk soil vapor samples will collected to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

The potential off-site migration of site contaminants is not expected to result in a complete exposure pathway for construction and remediation, or future conditions for the following reasons:

- The site is located in an urban area and predominantly covered with continuous, relatively impervious surface covering (i.e. buildings, and concrete slabs and asphalt)
- During site remediation and construction, the following protective measures will be implemented:
    - Air monitoring will be conducted for particulates (i.e., dust) and VOCs during intrusive activities as part of a CAMP. Dust and/or vapor suppression techniques will be employed to limit potential for off-site migration of soil and vapors.
    - Vehicle tires and undercarriages will be washed as necessary prior to leaving the site to prevent tracking material off-site.
    - A soil erosion/sediment control plan will be implemented during construction to control off-site migration of soil.
- Based on the conceptual development plan, foundation excavation is anticipated to remove all on-site impacted media, thereby eliminating all sources of site contamination and achieving a Track 1 cleanup for unrestricted use. In this scenario, exposure pathways will have been eliminated and the need for future control will not be necessary. If a Track 1 cleanup is not practicable, the development will include a site capping system.
- Accumulation of soil vapor beneath the building will be limited by the building foundation, which will extend into the groundwater table and include a continuous site-wide waterproofing system installed below the slab and along the vertical subgrade foundation sidewalls. The northwestern portion of the building cellar will likely be used

as parking with a ventilation system in accordance with the NYC Building and Mechanical Codes.

6.6 Evaluation of Human Health Exposure

Based upon the CSM and review of environmental data, complete on-site exposure pathways appear to be present, in the absence of protective measures and remediation. The complete exposure pathways indicate there is a risk of exposure to humans from site contaminants via exposure to soil, groundwater, and soil vapor for current and construction conditions.

Complete exposure pathways have the following five elements: 1) a contaminant source; 2) a contaminant release and transport mechanism; 3) a point of exposure; 4) a route of exposure; and 5) a receptor population. A discussion of the five elements comprising a complete pathway as they pertain to the site is provided below.

6.6.1 Current Conditions

Contaminant sources include 1) historic fill with varying levels of SVOCs, pesticides, and metals contamination; 2) historical petroleum bulk storage with petroleum-impacted soil, groundwater and soil vapor; and 3) historical site uses that may contribute to releases of CVOCs impacting soil, groundwater, and soil vapor and 4) historical uses of adjacent and surrounding sites that may contribute to the releases of CVOCs and petroleum-related contaminants in groundwater and soil vapor.

Contaminant release and transport mechanisms include contaminated soil transported as dust (dermal, ingestion, inhalation), contaminated groundwater flow (dermal contact), and volatilization of contaminants from the soil and groundwater matrices to the soil vapor phase (inhalation).

Under current conditions, the likelihood of exposure to humans is limited, as site access is restricted to authorized workers and guests. The majority of the site contains impervious covers (i.e., buildings, concrete, asphalt) and pervious areas are covered by overgrown vegetation, which have potential to control dust being generated. Exposure to contaminants in soil and groundwater via dermal contact or ingestion during investigation is minimized, as these activities would occur under a HASP/CHASP with CAMP to limit exposure to site workers and the community. In addition, groundwater is not used as potable water supply in Brooklyn.

6.6.2 Construction/Remediation Activities

During development and remediation, points of exposure include disturbed and exposed soil during excavation, dust and organic vapors generated during excavation, and contaminated groundwater that could be encountered during excavation and/or dewatering operations. Routes of exposure include ingestion and dermal absorption of contaminated soil and groundwater, inhalation of organic vapors arising from contaminated soil and groundwater (specifically in the area of petroleum and CVOC impacts), and inhalation of dust arising from contaminated soil. The receptor population includes construction and remediation workers and, to a lesser extent, the public adjacent to the site.

The potential for completed exposure pathways is present since all five elements exist; however, the risk will be minimized by the implementation of appropriate health and safety measures, such as monitoring the air for organic vapors and dust, using vapor and dust suppression measures, cleaning truck undercarriages before they leave the site to prevent off-site soil tracking, maintaining site security, and wearing the appropriate personal protective equipment (PPE).

6.6.3 Proposed Future Conditions

The proposed future conditions may include a Track 1 cleanup for unrestricted use (i.e., removal of all source and site contaminants), which would eliminate all on-site pathways of exposure to contaminants. If a Track 1 cleanup is not practicable, residual contaminants may remain on site and exposure pathways would be minimized through the use of engineering and institutional controls. In the event that the proposed building foundation is constructed below the water table, the airspace between groundwater and the bottom of foundation where contaminants in soil or groundwater could volatile into the vapor phase would be eliminated. In this scenario, points of exposure include future intrusive soil and groundwater handling for upgrades or modifications to the property.

6.6.4 Human Health Exposure Assessment Conclusions

1. Under current conditions, there is a marginal risk for human exposure to site contaminants. The primary exposure pathways are for dermal contact, ingestion, and inhalation of soil, soil vapor, or groundwater by site investigation workers. The exposure risks can be avoided or minimized by following the appropriate health and safety and vapor and dust suppression measures outlined in the site-specific HASP and CAMP during investigation activities.

   Prior to site development, there exists the potential for soil vapor intrusion into neighboring buildings. However, exposure is expected to be limited by the following:

   - The west-adjoining building is an open-air parking garage with natural air ventilation. The open ventilated parking garage prevents the potential for a soil vapor intrusion issue.
   - The north-adjoining building was observed during the 2017 Geotechnical Engineering Study to have a waterproofed foundation that extended below the groundwater table. A foundation set below the groundwater table blocks the migration or accumulation of soil vapor, which prevents the potential for a soil vapor intrusion issue.

   The following air sampling program will be implemented during the 45-day RAWP public comment period:

- The volunteer commits to contacting owners of the adjacent residential building to the north (214 North 11th Street) to request access and, where feasible, to conduct sub-slab soil vapor and indoor air sampling (three paired indoor air and sub-slab vapor samples). Sub-slab soil vapor sampling would not be feasible if the bottom of the building slab is at or below the water table. If the slab is below the water table and the adjoining building owner allows sampling, three indoor air samples will be collected. The adjoining building to the west is a ventilated parking garage and soil vapor intrusion is not a concern.
- The volunteer commits to collecting three sidewalk soil vapor samples to evaluate off-site soil vapor; one in the Roebling Street sidewalk, one in the sidewalk at the intersection of Roebling Street and North 10th Street, and one in the North 10th Street sidewalk.

2. In the absence of a HASP and CAMP, there is a moderate risk of exposure during construction and remediation activities. The primary exposure pathways are:
    a. Dermal contact, ingestion and inhalation of contaminated soil, groundwater or soil vapor by construction workers.
    b. Dermal contact, ingestion and inhalation of soil (dust) and inhalation of soil vapor by the community in the vicinity of the site.

   These exposure risks can be avoided or minimized by performing community air monitoring and by following the appropriate health and safety, vapor and dust suppression and site security measures outlined in a site-specific HASP.

3. The existence of a complete exposure pathway for site contaminants to human receptors during proposed future conditions is unlikely, as a large quantity of soil will be excavated and transported to an off-site disposal facility and any residual soil remaining will be capped with an impermeable foundation cover. Residual contamination would be managed in accordance with a Site Management Plan that would be prepared, if necessary, following site development.
4. Regional groundwater is not used as a potable water source in Brooklyn so exposure to regional groundwater contaminants is unlikely.
5. Construction of the proposed development will include excavation and off-site disposal of contaminated media to about 18.5 feet bgs, terminating within a native organics layer. Residual contamination will be limited following construction. Implementation of a dewatering treatment system is expected in combination with the support of excavation (SOE) system to install the building’s foundation below the static groundwater table. Soil vapor contamination originating from groundwater is anticipated to be removed through the dewatering and treatment system. Reducing, and possibly

eliminating, on-site sources of soil vapor contamination through construction means will limit or prevent exposure to off-site receptor populations.

7.0 NATURE AND EXTENT OF CONTAMINATION

This section evaluates the nature and extent of soil, groundwater, and soil vapor contamination as derived from a combination of field observations and analytical data that were discussed in Section 5.0 and from previous investigations.

7.1 Soil Contamination

The following discussion is divided by the following contaminant classifications:

1. Historic Fill
2. Petroleum-Impacted Material
3. CVOC-Impacted Material

7.1.1 Historic Fill Material

Contaminants related to historic fill material at the site include SVOCs, pesticides, and metals. Historic fill exists across the site, extending from surface grade to depths ranging from about 6 to 11.5 feet bgs. Eleven soil samples collected from the historic fill layer contained concentrations of SVOCs (including 3-methylphenol/4-methylphenol, phenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene,), metals (including arsenic, cadmium, trivalent chromium, copper, silver, nickel, selenium, zinc, lead, and mercury), and pesticides (4,4’-DDE, 4,4’-DDT, dieldrin) exceeding their respective UU and, in some cases, RURR SCOs.

7.1.2 Petroleum-Contaminated Material

Petroleum impacts to soil (evident by PID readings above background, odors, and staining) at depths ranging from 7 to 13.5 feet bgs were observed during the RI in borings 16B1, 16B2, 16B3 and 16B7 and during the Preliminary Site Investigation in borings LB01 and LB02. These impacts generally correspond with the observed groundwater interface. The maximum PID reading, 634.1 ppm, was recorded in 16B3 from 7 to 8 feet bgs. Soil boring 16B1, located up gradient to the potential USTs, contained gross staining and product from about 7 to 13.5 feet bgs. Analytical results for soil samples collected from 16B1, 16B3, 16B8, LB02 and LB05 exhibited concentrations of petroleum-related VOCs, including 1,2,4-trimethlybenzene, benzene, naphthalene, and total xylenes, exceeding UU SCOs in surficial samples and samples collected around the groundwater table. Soil boring logs from the Preliminary Investigation Report are included in Appendix A.

7.1.3 CVOC-Contaminated Material

Concentrations of CVOCs in excess of their respective UU SCOs were identified in surficial soil samples and samples collected around the groundwater interface from RI borings 16B1, 16B2, 16B3, 16B5, 16B6, 16B8, and 16B10, and previous borings B1, B2, B3, B4, B5, B6, B8, B10, and B11. The samples exhibiting concentrations of TCE exceeding UU SCOs were collected from the northwest, west-central and eastern portions of the site. The highest concentrations of TCE and its degradation byproducts (vinyl chloride, 1,2-DCE) were detected up to 8 feet bgs generally in the north and eastern portions of the site. CVOCs were detected at a maximum depth of about 12 feet bgs across the site, consistent with the approximate start of the clay stratigraphy. Therefore, it is likely that the clay layer is acting as a vertical barrier to potential vertical migration of CVOCs. The presence of CVOCs in soil are likely due to a release during site historical operations.

7.2 Groundwater Contamination

The discussion is divided by the following contaminant classifications:

1. Petroleum-Contaminated Groundwater
2. CVOC-Contaminated Groundwater
3. Regional Groundwater Quality

7.2.1 Petroleum-Contaminated Groundwater

Analytical results for samples collected from wells MW3 and 16MW1 in the central portion of the site exhibited concentrations of petroleum-related VOCs, including 1,2,4-trimethylbenzene, and naphthalene, exceeding their respective TOGS Class GA SGVs. During the EBC Phase II ESI, a black liquid was encountered in monitoring well MW3. EBC collected a sample for identification and determined the liquid most closely resembled No. 6 fuel oil. A black liquid or non-aqueous phase liquid (NAPL), was not observed when the same well was sampled during the 2017 RI. According the analytical results, petroleum contamination in groundwater appears localized to the central and eastern portions of the site in the vicinity of wells MW3 and 16MW1, likely due to a release in this area or an off-site source migrating on-to the site.

7.2.2 CVOC-Contaminated Groundwater

Analytical results revealed CVOC impacts to groundwater localized in the central and eastern portions of the site. Concentrations of CVOCs, including 1,1-dichloroethane, cis-1,2-dichloroethene, TCE, and vinyl chloride exceeding their respective TOGS Class GA SGVs, were found in samples collected from wells MW3, MW4, 16MW1, 16MW2 and 16MW3. When comparing groundwater analytical data from the 2015 Phase II to the 2017 RI, concentrations of TCE has decreased, while concentrations of breakdown daughter products 1,1-dichloroethane and vinyl chloride have increased. This shift from parent to daughter products suggests that CVOCs in groundwater are following the reductive dechlorination pathway.

7.2.3 Regional Groundwater Quality

Metals concentrations detected above TOGS Class GA SGVs include eight total metals (arsenic, iron, lead, manganese, mercury, nickel, sodium, and zinc) and six dissolved metals (arsenic, iron, manganese, nickel, sodium, and zinc). With the exception of arsenic, the concentrations detected are attributed to regional groundwater contamination and are not considered a localized concern. The presence of arsenic at a concentration above its TOGS Class GA SGV may be the result of historical site uses as manufacturing or due to the quality of the historic fill.

7.3 Soil Vapor Contamination

A total of 43 VOCs, including petroleum-related and chlorinated VOCs, were detected in soil vapor samples across the site. Total CVOC concentrations in soil vapor ranged from 178.6 $\mu g/m^3$ in SG-6 to 259,057 $\mu g/m^3$ in SG-4. Total BTEX concentrations in soil vapor samples ranged from 93.8 $\mu g/m^3$ in SG-5 to 374.8 $\mu g/m^3$ in SG-2. The highest concentrations of CVOCs and BTEX compounds were detected in the central and eastern portions of the site, which is consistent with the locations of petroleum- and CVOC-contaminated groundwater.

8.0 CONCLUSIONS

The RI was implemented between November 20 and 29, 2017. The findings summarized herein are based on both qualitative data (field observations and instrumental readings), and laboratory analytical results of soil, groundwater, and soil vapor samples collected during the RI and previous investigations. Findings and conclusions are as follows:

1. Stratigraphy: A historic fill layer was observed from surface grade to depths ranging from about 6 feet bgs in 16B5 to 11.5 feet bgs in 16B8 and consisted of brown, fine- to medium-grained sand with varying amounts of gravel, brick, concrete, asphalt, silt, glass, wood, coal fragments and slag. The fill layer is underlain by native soils typically consisting of fine silty sands. A clay layer was observed beginning at about 11 feet bgs and extending to at least to about 20 feet bgs. Based on findings from the geotechnical exploration, bedrock was not encountered within 100 feet of site grades.
2. Hydrogeology: Groundwater was encountered at about 6 to 6.5 feet bgs and is interpreted to flow west towards to East River.
3. Historic Fill Quality: Fill contains SVOCs, metals, and pesticides at concentrations above UU and/or RURR SCOs. VOCs were also identified within the historic fill, but are associated with potential chemical releases from historical uses of the site and surrounding sites.
4. Petroleum-Impacted Soil, Groundwater and Soil Vapor:
    a. Field observations identified petroleum impacts, evidenced by odors, staining, and PID readings above background levels, in soil to depths of about 13.5 feet bgs in the central and eastern portions of the site. Product, staining, and/or odors were observed in boring 16B1 from 7 to 13.5 feet bgs, terminating within the clay layer. Petroleum-related constituents were detected at concentrations above UU and, in some areas, above RURR SCOs in soil samples collected from depths to about 12 feet bgs (B3).
    b. Petroleum-related VOCs were detected in groundwater at concentrations exceeding TOGS Class GA SGVs at wells located in the central and eastern portions of the site, which are up-gradient to the USTs identified on the 1942 Sanborn Map and by the GPR survey. During the EBC Phase II ESI, a black liquid was encountered in monitoring well MW3. EBC collected a sample for identification and determined the liquid most closely resembled No. 6 fuel oil. NAPL or other free product was not observed in any of the sampled wells during the 2017 RI.
    c. Petroleum-related constituents (including BTEX) were identified in soil vapor samples collected throughout the site.

   d. The presence of petroleum-related VOCs and SVOCs in soil is attributed to potential releases associated with the former auto repair facilities and historical USTs. The petroleum-related contamination in groundwater and soil vapor may be attributed to a combination of releases from site operations and adjacent and surrounding properties.

5. <u>CVOC-Impacted Soil, Groundwater and Soil Vapor</u>: Analytical data revealed concentrations of CVOCs in soil exceeding UU SCOs generally to depths of about 8 feet bgs and up to a maximum depth of about 12 feet bgs. CVOCs were also identified in groundwater samples at concentrations that exceed TOGS Class GA SGVs in the central and eastern portions of the site. CVOC impacts were identified in soil vapor samples collected across the site, with the highest concentrations located in the central and eastern portions of the site. The presence of CVOCs in soil, groundwater and soil vapor is likely a combination of releases from historical site uses as a repair facility and chemical warehouse or an off-site source.

Sufficient analytical data were gathered during the RI, together with previous studies, to establish site-specific soil cleanup levels and to develop a remedy for the site. The final remedy will be described and evaluated in a RAWP to be prepared in accordance with NYS BCP guidelines. The remedy will address historic fill impacted with SVOCs pesticides and metals; petroleum- and CVOC-impacted soil, groundwater and soil vapor; potential soil vapor intrusion conditions; and a contingency plan for the removal and closure of unknown USTs.

9.0 REFERENCES

1. Busciolano, Ronald. 2002. "Water-Table and Potentiometric-Surface Altitudes of the Upper Glacial, Magothy, and Lloyd Aquifers on Long Island, New York, in March-April 2000, with a Summary of Hydrogeologic Conditions."
2. New York State Department of Health, Final Guidance for the Evaluation of Soil Vapor Intrusion in the State of New York, dated October 2006 and applicable revisions (March 2017).
3. New York State Department of Environmental Conservation, Division of Environmental Remediation, Draft Brownfield Cleanup Program Guide, dated May 2004.
4. New York State Department of Environmental Conservation, DER-10 Technical Guidance for Site Investigation and Remediation, issued May 3, 2010; effective June 18, 2010.
5. New York State Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) dated June 1998.
6. United States Environmental Protection Agency, Low Flow Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, EQASOP-GW 001, January 19, 2010.
7. New York State Department of Environmental Conservation, Part 375 of Title 6 of the New York Compilation of Codes, Rules, and Regulations, Effective December 14, 2006.
8. Environmental Business Consultant (EBC) Phase I Screening Summary, dated August 2015
9. EBC Phase II Investigation Data Summary, dated July 23, 2015
10. EBC Remedial Investigation Work Plan, February 8, 2017
11. Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. Preliminary Site Investigation, dated October 20, 2017

Table 1
Sample Analysis Summary
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Boring Location	Sample Name	Sample Depth (feet bgs)	Target Sample Interval	Sample Date	Sample Time	Laboratory Analysis
Soil						
16B1	16B1_0-2	0 to 2	0-2 foot Interval	11/20/2017	10:35	TCL/Part 375 VOCs + TICs (Method 8260C) TCL/Part 375 SVOCs + TICs (Method 8270D) TAL/Part 375 Metals (Method 6010C)
	16B1_7-8	7 to 8	Highest PID	11/20/2017	11:00	
	16B1_11-12	11 to 12	10-15 foot Interval	11/20/2017	11:10	
	16B1_14-15	14 to 15	Deepest/Clean Interval	11/20/2017	11:20	
16B2	16B2_7-8	7 to 8	0-2 foot Interval	11/20/2017	9:30	
	16B2_11-12	11 to 12	10-15 foot Interval	11/20/2017	9:35	
	16B2_13-14	13 to 14	Highest PID	11/20/2017	10:05	
	16B2_14-15	14 to 15	Clean, Vertical Delineation	11/20/2017	10:10	
16B3	16B3_0-2	0 to 2	0-2 foot Interval	11/21/2017	12:25	
	16B3_7-8	7 to 8	High PID	11/21/2017	12:40	
	16B3_10.5-11.5	10.5 to 11.5	Clean, Vertical Delineation	11/21/2017	12:45	
16B8	16B8_0-2	0 to 2	0-2 foot Interval	11/20/2017	13:55	
	16B8_5.5-6.5	5.5 to 6.5	3-5 foot Interval	11/20/2017	13:30	
	16B8_11-12	11 to 12	10-15 foot Interval	11/20/2017	14:00	
	16B8_14-15	14 to 15	Deepest Interval	11/20/2017	14:05	
16B4	16B4_3-4	3 to 4	3-5 foot Interval	11/21/2017	13:20	
	16B4_11-12	11 to 12	10-15 foot Interval	11/21/2017	13:25	
	16B4_14.5-15	14.5 to 15	Deepest Interval	11/21/2017	13:35	
16B5	16B5_4.5-5	4.5 to 5	3-5 foot Interval	11/20/2017	12:50	
	16B5_12-13	12 to 13	10-15 foot Interval	11/20/2017	12:55	
	16B5_14-15	14 to 15	Deepest Interval	11/20/2017	13:00	
16B6	16B6_3-4	3 to 4	3-5 foot Interval	11/21/2017	13:50	
	16B6_10-11	10 to 11	10-15 foot Interval	11/21/2017	14:15	
	16B6_14.5-15	14.5 to 15	Deepest Interval	11/21/2017	14:30	
16B7	16B7_6.5-7.5	6.5 to 7.5	Highest PID	11/20/2017	14:30	
	16B7_11-12	11 to 12	Impacts, interval directly below	11/20/2017	14:50	
16B9	16B9_10-11	10 to 11	Highest PID	11/20/2017	11:35	EPH TCL/TAL/ Full Part 375 (TICs for VOCs and SVOCs), hexavalent chromium, cyanide, and Priority Pollutants + 40
16B10	16B10_7-8	7 to 8	Highest PID	11/20/2017	12:05	
16B11	16B11_7-8	7 to 8	Highest PID	11/20/2017	13:10	
Groundwater						
16MW1	16MW1_112917	NA	LNAPL Recovery	11/29/2017	15:35	TCL/Part 375 VOCs + TICs (Method 8260C) TCL/Part 375 SVOCs + TICs (Method 8270D) TAL/Part 375 Metals (Method 6010C) TAL/Part 375 Dissolved Metals (Method 6010C)
16MW2	16MW2_112917	NA	LNAPL Recovery	11/29/2017	14:30	
16MW3	16MW3_112917	NA	LNAPL Recovery	11/29/2017	13:05	
MW3	MW3_112917	NA	LNAPL Recovery	11/29/2017	11:25	
MW4	MW4_112917	NA	LNAPL Recovery	11/29/2017	16:45	
Quality Assurance/Quality Control						
16B5	SODUP01_112017	12 to 13	16B5_12-13 Duplicate	11/20/2017	-	TCL/Part 375 VOCs + TICs (Method 8260C) TCL/Part 375 SVOCs + TICs (Method 8270D) TAL/Part 375 Metals (Method 6010C)
16B4	SODUP02_112117	3 to 4	16B4_3-4 Duplidate	11/21/2017	-	
16B3	SOMS/MSD_112017	0 to 2	16B3_0-2	11/21/2017	1230	
16B6	SOMS/MSD_112117	3 to 4	16B6_3-4	11/21/2017	1355	
16MW2	GWDUP01_112917	NA	16MW2 Duplicate	11/29/2017	-	TCL/Part 375 VOCs + TICs (Method 8260C) TCL/Part 375 SVOCs + TICs (Method 8270D) TAL/Part 375 Metals (Method 6010C) TAL/Part 375 Dissolved Metals (Method 6010C)
MW3	GWMS/MSD_112917	NA	MW3	11/29/2017	11:30	
Trip Blank	TB01_112017	NA	Day 1: Cooler #1	11/20/2017	15:30	VOCs EPA Method 8260B
Trip Blank	TB02_112017	NA	Day 1: Cooler #2	11/20/2017	15:35	
Trip Blank	TB03_112117	NA	Day 2: Cooler #1	11/21/2017	15:15	
Trip Blank	TB04_112917	NA	Day 3: Cooler #1	111/29/2017	14:15	
Trip Blank	TB05_112917	NA	Day 3: Cooler #2	11/29/2017	14:20	

Notes:

1. TCL = Target Compound List
2. TAL = Target Analyte List
3. TIC = Tentatively Identified Compound
4. VOC = Volatile Organic Compound
5. SVOC = Semivolatile Organic Compound
6. EPH = Extractable Petroleum Hydrocarbon
7. EPA = Environmental Protection Agency
8. bgs = below grade surface
9. NA = Not Applicable
10. QA/QC = Quality Assurance/Quality Control
11. SODUP01_112017 is a duplicate of the parent sample 16B5_12-13
12. SODUP02_11217 is a duplicate of the parent sample 16B4_3-4
13. GWDUP01_112917 is a duplicate of the parent sample MW3_112917

Table 2
Monitoring Well Construction Summary
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Location Identification Number	Date of Completion/ Construction	Well Status	Total Depth (feet bgs)	Diameter (inches)	Approximate Top of PVC Casing Elevation (NAVD88)	Screened Interval (feet bgs)	Construction Material
16MW1	11/21/2017	Permanent	15	1	8.57	5 to 15	1"-diameter Pre-Pack PVC
16MW2	11/21/2017				8.04		
16MW3	11/21/2017				7.74		

Notes:

1. N/A = Not Applicable
2. PVC = Polyvinyl Chloride
3. bgs = below grade surface
4. NAVD88 = North American Vertical Datum of 1988

Table 3
Groundwater Elevation Summary
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Well ID	Screened Interval (feet bgs)	Total Depth (feet bgs)	Top of Casing Elevation (NAVD88)	Depth to Water from top of PVC Casing (feet bgs)		Elevation of Water Level (NAVD88)	
				11/29/2017	1/2/2018	11/29/2017	1/2/2018
MW-1	5 to 15	15	8.78	6	6.99	2.78	1.79
MW-2	5 to 15	15	9.2	-	7.6	-	1.60
MW-3	5 to 15	15	7.98	6.39	6.9	1.59	1.08
MW-4	5 to 15	15	8.59	6.66	6.88	1.93	1.71
16MW1	5 to 15	15	8.57	6.81	6.85	1.76	1.72
16MW2	5 to 15	15	8.04	6.42	6.75	1.62	1.29
16MW3	5 to 15	15	7.74	6.03	6.98	1.71	0.76

Notes:

1. Elevations are referenced to North American Vertical Datum of 1988 (NAVD88).
2. PVC = polyvinyl chloride
3. bgs = below grade surface

Table 4A
Soil Sample Results Summary
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Location	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	16B1				16B2				16B3			16B4				16B5				16B6			16B7		16B8			
Sample ID			16B1_0-2	16B1_7-8	16B1_11-12	16B1_14-15	16B2_7-8	16B2_11-12	16B2_13-14	16B2_14-15	16B3_0-2	16B3_7-8	16B3_10.5-11.5	16B4_3-4	SODUP02_112117	16B4_11-12	16B4_14.5-15	16B5_4.5-5	16B5_12-13	SODUP01_112017	16B5_14-15	16B6_3-4	16B6_10-11	16B6_14.5-15	16B7_6.5-7.5	16B7_11-12	16B8_0-2	16B8_5.5-6.5	16B8_11-12	16B8_14-15
Sampling Date			11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/21/2017	11/21/2017	11/21/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017	11/20/2017
Lab Sample ID			L1742789-12	L1742789-16	L1742789-15	L1742789-11	L1742789-20	L1742789-10	L1742789-14	L1742789-19	L1743026-01	L1743026-02	L1743026-03	L1743026-05	L1743026-11	L1743026-06	L1743026-07	L1742789-22	L1742789-13	L1742789-18	L1742789-08	L1743026-08	L1743026-09	L1743026-10	L1742789-05	L1742789-06	L1742789-02	L1742789-01	L1742789-03	L1742789-04
Sampling Depth (feet bgs)			0 to 2	7 to 8	11 to 12	14 to 15	7 to 8	11 to 12	13 to 14	14 to 15	0 to 2	7 to 8	10.5 to 11.5	3 to 4	3 to 4	11 to 12	14.5 to 15	4.5 to 5	12 to 13	12 to 13	14 to 15	3 to 4	10 to 11	14.5 to 15	6.5 to 7.5	11 to 12	0 to 2	5.5 to 6.5	11 to 12	14 to 15
VOCs (mg/kg)																														
1,1,1-Trichloroethane	0.68	100	0.17 U	0.28 U	0.0011 U	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.035 J	0.14 U	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
1,1-Dichloroethane	0.27	26	0.25 U	0.42 U	0.0017 U	0.0031 U	0.12 U	0.0016 U	0.0016 U	0.0022 U	0.12 U	0.23	0.09 U	0.0024 U	0.17 U	0.0014 U	0.0015 U	0.15 U	0.003 U	0.0031 U	0.0028 U	0.13 U	0.0013 U	0.0015 U	0.0017 U	0.0013 U	0.17 U	0.21 U	0.17 U	0.0013 U
1,1-Dichloroethene	0.33	100	0.17 U	0.11 J	0.0021	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.078 U	0.14 U	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
1,2,3-Trichloropropane	~	~	1.7 U	2.8 U	0.011 U	0.02 U	0.79 U	0.011 U	0.011 U	0.015 U	0.021 J	1.4 U	0.6 U	0.016 U	1.1 U	0.0095 U	0.0098 U	0.99 U	0.02 U	0.02 U	0.019 U	0.9 U	0.009 U	0.01 U	0.012 U	0.0089 U	1.1 U	1.4 U	1.1 U	0.0086 U
1,2,4,5-Tetramethylbenzene	~	~	0.67 U	4.8	0.062	0.0082 U	0.32 U	0.00019 J	0.00028 J	0.0059 U	0.038 J	0.4 J	0.24 U	0.0064 U	0.46 U	0.0038 U	0.0039 U	0.4 U	0.0081 U	0.0082 U	0.0075 U	0.36 U	0.0036 U	0.0041 U	0.0016 J	0.0036 U	0.44 U	0.56 U	0.44 U	0.0034 U
1,2,4-Trimethylbenzene	3.6	52	0.84 U	**8.7**	0.11	0.01 U	0.4 U	0.0054 U	0.0054 U	0.0003 J	0.56	**6.2**	0.3 U	0.008 U	0.57 U	0.0048 U	0.0049 U	0.027 J	0.01 U	0.00062 J	0.0093 U	0.041 J	0.0045 U	0.0052 U	0.0058 U	0.0044 U	0.55 U	0.7 U	0.56 U	0.00022 J
1,2-Dibromo-3-chloropropane	~	~	0.84 U	1.4 U	0.0057 U	0.01 U	0.4 U	0.0054 U	0.0054 U	0.0074 U	0.39 UJ	0.73 UJ	0.3 UJ	0.008 UJ	0.57 U	0.0048 UJ	0.0049 UJ	0.5 U	0.01 U	0.01 U	0.0093 U	0.45 U	0.0045 UJ	0.0052 UJ	0.0058 U	0.0044 U	0.55 U	0.7 UJ	0.56 U	0.0043 U
1,3,5-Trimethylbenzene	8.4	52	0.84 U	2.8	0.04	0.01 U	0.4 U	0.0054 U	0.0054 U	0.0074 U	0.38 J	0.15 J	0.3 U	0.008 U	0.57 U	0.0048 U	0.0049 U	0.024 J	0.01 U	0.00039 J	0.0093 U	0.02 J	0.0045 U	0.0052 U	0.0058 U	0.0044 U	0.55 U	0.7 U	0.56 U	0.0002 J
2-Butanone	0.12	100	1.7 U	2.8 U	0.011 U	0.02 U	0.79 U	0.0068 J	0.011	0.015 U	**0.78 UJ**	**1.4 UJ**	**0.6 UJ**	0.016 UJ	1.1 U	0.0095 UJ	0.0034 J	0.99 U	0.02 U	0.02 U	0.019 U	0.9 U	0.0043 J	0.02 J	0.0075 J	0.0089 U	1.1 U	**1.4 UJ**	1.1 U	0.0086 U
Acetone	0.05	100	1.7 U	2.8 U	0.033	0.045	0.79 U	0.038	0.048	0.05	**0.23 J**	1.4 U	0.6 U	0.01 J	1.1 U	**0.051**	0.039	0.99 U	0.037	0.046	0.043	0.9 U	0.033	**0.1**	0.032	0.0097	1.1 U	1.4 U	1.1 U	0.014
Acrolein	~	~	4.2 U	7 U	0.028 U	0.051 U	2 U	0.027 U	0.027 U	0.037 U	2 U	3.6 U	1.5 U	0.04 U	2.9 U	0.024 U	0.024 U	2.5 U	0.05 U	0.051 U	0.047 U	2.2 U	0.022 U	0.026 U	0.029 UJ	0.022 U	2.8 U	3.5 U	2.8 U	0.022 U
Bromodichloromethane	~	~	0.17 U	0.28 U	0.0011 U	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.078 UJ	0.14 UJ	0.06 UJ	0.0016 UJ	0.11 UJ	0.00095 UJ	0.00098 UJ	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 UJ	0.001 UJ	0.0012 U	0.00089 U	0.11 U	0.14 UJ	0.11 U	0.00086 U
Bromoform	~	~	0.67 UJ	1.1 UJ	0.0046 U	0.0082 U	0.32 U	0.0044 U	0.0043 U	0.0059 U	0.31 UJ	0.58 UJ	0.24 UJ	0.0064 UJ	0.46 UJ	0.0038 UJ	0.0039 UJ	0.4 UJ	0.0081 U	0.0082 U	0.0075 U	0.36 U	0.0036 UJ	0.0041 UJ	0.0046 U	0.0036 U	0.44 UJ	0.56 UJ	0.44 UJ	0.0034 U
Bromomethane	~	~	0.34 U	0.56 U	0.0023 U	0.0041 U	0.16 U	0.0022 U	0.0022 U	0.003 U	0.16 U	0.29 U	0.12 U	0.0032 U	0.06 J	0.0019 U	0.002 U	0.2 U	0.004 U	0.0041 U	0.0037 U	0.18 U	0.0018 U	0.0021 U	0.0023 U	0.0018 U	0.22 U	0.28 U	0.22 U	0.0017 U
Carbon disulfide	~	~	1.7 UJ	2.8 UJ	0.0032 J	0.011 J	0.79 UJ	0.0012 J	0.0022 J	0.013 J	0.78 UJ	1.4 UJ	0.6 UJ	0.016 UJ	1.1 UJ	0.0095 UJ	0.0098 UJ	0.99 UJ	0.014 J	0.013 J	0.01 J	0.9 U	0.009 UJ	0.01 UJ	0.012 U	0.0089 U	1.1 UJ	1.4 UJ	1.1 UJ	0.0012 J
Carbon tetrachloride	0.76	2.4	0.17 U	0.28 U	0.00043 J	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.078 U	0.14 U	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
cis-1,2-Dichloroethene	0.25	100	0.12 J	**1.1**	0.056	0.002 U	0.15	0.0011 U	0.0011 U	0.0015 U	0.078 U	**16**	0.06 U	0.0089 J	**0.63 J**	0.00095 U	0.00064 J	**1.3**	0.0017 J	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00089 U	**0.78**	**0.39**	**0.26**	0.00086 U
Cyclohexane	~	~	3.4 U	0.46 J	0.014 J	0.041 U	1.6 U	0.022 U	0.022 U	0.03 U	1.6 U	2.9 U	1.2 U	0.032 U	2.3 U	0.019 U	0.02 U	2 U	0.04 U	0.041 U	0.037 U	1.8 U	0.018 U	0.021 U	0.023 U	0.018 U	2.2 U	2.8 U	2.2 U	0.017 U
Dibromochloromethane	~	~	0.17 UJ	0.28 UJ	0.0011 U	0.002 U	0.079 UJ	0.0011 U	0.0011 U	0.0015 U	0.078 UJ	0.14 UJ	0.06 UJ	0.0016 UJ	0.11 U	0.00095 UJ	0.00098 UJ	0.099 UJ	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 UJ	0.001 UJ	0.0012 U	0.00089 U	0.11 UJ	0.14 UJ	0.11 UJ	0.00086 U
Ethylbenzene	1	41	0.17 U	0.43	0.0052	0.00042 J	0.079 U	0.0011 U	0.0011 U	0.00027 J	0.77	0.6	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.00038 J	0.002 U	0.00039 J	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00019 J	0.038 J	0.14 U	0.021 J	0.00021 J
Isopropylbenzene	~	~	0.17 U	0.57	0.0095	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.22	0.51	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
Methyl Acetate	~	~	3.4 U	5.6 U	0.023 U	0.041 U	0.12 J	0.022 U	0.022 U	0.03 U	0.28 J	2.9 U	1.2 U	0.032 U	2.3 U	0.019 U	0.02 U	2 U	0.04 U	0.041 U	0.037 U	1.8 U	0.018 U	0.021 U	0.023 U	0.018 U	2.2 U	2.8 U	2.2 U	0.017 U
Methyl cyclohexane	~	~	0.24 J	1.9	0.048	0.0082 U	0.32 U	0.0044 U	0.0007 J	0.0059 U	0.31 U	0.096 J	0.24 U	0.0064 U	0.46 U	0.0038 U	0.0039 U	0.4 U	0.0081 U	0.0082 U	0.0075 U	0.36 U	0.0036 U	0.0041 U	0.0046 U	0.0036 U	0.26 J	0.56 U	0.13 J	0.0034 U
Methyl tert butyl ether	0.93	100	0.34 U	0.56 U	0.0023 U	0.0041 U	0.16 U	0.0022 U	0.0022 U	0.003 U	0.018 J	0.29 U	0.12 U	0.0032 U	0.23 U	0.0019 U	0.002 U	0.2 U	0.004 U	0.0041 U	0.0037 U	0.015 J	0.0018 U	0.0021 U	0.0023 U	0.0018 U	0.22 U	0.28 U	0.22 U	0.0017 U
Naphthalene	12	100	0.024 J	**13**	0.11	0.01 U	0.15 J	0.0054 U	0.0054 U	0.0074 U	0.089 J	0.12 J	0.76	0.008 UJ	1.3 J	0.0048 U	0.0049 U	0.056 J	0.01 U	0.00089 J	0.0093 U	0.038 J	0.0045 U	0.0052 U	0.0058 U	0.0044 U	0.55 U	0.7 U	0.023 J	0.00045 J
n-Butylbenzene	12	100	0.17 U	1	0.013	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.078 U	0.28	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
n-Propylbenzene	3.9	100	0.17 U	0.76	0.011	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.098	0.94	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.0012 U	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
o-Xylene	~	~	0.34 U	1.3	0.021	0.0041 U	0.16 U	0.0022 U	0.0022 U	0.003 U	2.7	0.13 J	0.12 U	0.0032 U	0.23 U	0.0019 U	0.002 U	0.2 U	0.004 U	0.0041 U	0.0037 U	0.18 U	0.0018 U	0.0021 U	0.0023 U	0.0018 U	0.12 J	0.28 U	0.22 U	0.0017 U
p/m-Xylene	~	~	0.34 U	1.3	0.017	0.0041 U	0.16 U	0.0022 U	0.0022 U	0.003 U	4.5	2	0.12 U	0.0032 U	0.23 U	0.0019 U	0.002 U	0.2 U	0.004 U	0.0041 U	0.0037 U	0.034 J	0.0018 U	0.0021 U	0.0023 U	0.0018 U	0.37	0.28 U	0.1 J	0.0017 U
p-Diethylbenzene	~	~	0.67 U	6.2	0.085	0.0082 U	0.32 U	0.0044 U	0.0043 U	0.0059 U	0.31 U	0.58 U	0.24 U	0.0064 U	0.46 U	0.0038 U	0.0039 U	0.4 U	0.0081 U	0.0082 U	0.0075 U	0.36 U	0.0036 U	0.0041 U	0.0046 U	0.0036 U	0.44 U	0.56 U	0.44 U	0.0034 U
p-Ethyltoluene	~	~	0.67 U	3.7	0.053	0.0082 U	0.32 U	0.0044 U	0.0043 U	0.00035 J	0.42	0.37 J	0.24 U	0.0064 U	0.46 U	0.0038 U	0.0039 U	0.4 U	0.0081 U	0.00057 J	0.0075 U	0.034 J	0.0036 U	0.0041 U	0.0046 U	0.00022 J	0.44 U	0.56 U	0.44 U	0.00022 J
p-Isopropyltoluene	~	~	0.17 U	0.97	0.012	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.025 J	0.044 J	0.06 U	0.0016 U	0.21 J	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.018 J	0.0009 U	0.001 U	0.0012 U	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
sec-Butylbenzene	11	100	0.17 U	0.87	0.013	0.002 U	0.079 U	0.0011 U	0.0011 U	0.0015 U	0.078 U	0.61	0.06 U	0.0016 U	0.11 U	0.00095 U	0.00098 U	0.099 U	0.002 U	0.002 U	0.0019 U	0.09 U	0.0009 U	0.001 U	0.00057 J	0.00089 U	0.11 U	0.14 U	0.11 U	0.00086 U
tert-Butylbenzene	5.9	100	0.84 U	0.19 J	0.0032 J	0.01 U	0.4 U	0.0054 U	0.0054 U	0.0074 U	0.39 U	0.17 J	0.3 U	0.008 U	0.57 U	0.0048 U	0.0049 U	0.5 U	0.01 U	0.01 U	0.0093 U	0.45 U	0.0045 U	0.0052 U	0.0024 J	0.0044 U	0.55 U	0.7 U	0.56 U	0.0043 U
Tetrachloroethene	1.3	19	0.84	0.28 U	0.0035	0.002 U	0.083	0.0011 U	0.0011 U	0.0015 U	0.36	0.14 U	0.06 U	0.022 J	0.87 J	0.00095 U	0.00048 J	**5.7**	0.0008 J	0.002 U	0.0019 U	0.79	0.0009 U	0.001 U	0.0012 U	0.00089 U	**2.3**	0.36	0.23	0.00086 U
Toluene	0.7	100	0.25 U	0.087 J	0.00082 J	0.0031 U	0.051 J	0.0016 U	0.0016 U	0.0022 U	0.11 J	0.058 J	0.09 U	0.0024 U	0.17 U	0.0014 U	0.0015 U	0.66	0.003 U	0.00041 J	0.0028 U	0.058 J	0.0013 U	0.0015 U	0.0017 U	0.00018 J	0.17 U	0.21 U	0.18	0.0002 J
trans-1,2-Dichloroethene	0.19	100	0.25 U	0.42 U	0.0008 J	0.0031 U	0.12 U	0.0016 U	0.0016 U	0.0022 U	0.12 U	**1.1**	0.09 U	0.0024 U	0.17 U	0.0014 U	0.0015 U	0.073 J	0.003 U	0.0031 U	0.0028 U	0.13 U	0.0013 U	0.0015 U	0.0017 U	0.0013 U	0.17 U	0.21 U	0.17 U	0.0013 U
Trichloroethene	0.47	21	**30**	0.34	0.14	0.002 U	**5.5**	0.0011 U	0.0011 U	0.0015 U	0.45	**9.6**	0.06 U	0.049 J	**4.6 J**	0.00095 U	0.00095 J	**13**	0.0022	0.0011 J	0.0019 U	**3.1**	0.0009 U	0.001 U	0.0012 U	0.00046 J	**29**	**15**	**15**	0.0085
Vinyl chloride	0.02	0.9	0.34 U	0.56 U	0.011	0.0041 U	0.16 U	0.0022 U	0.0022 U	0.003 U	0.16 U	**1.6**	0.12 U	0.0032 U	0.23 U	0.0019 U	0.002 U	0.2 U	0.001 J	0.0041 U	0.0037 U	0.18 U	0.0018 U	0.0021 U	0.0023 U	0.0018 U	0.22 U	0.28 U	0.22 U	0.0017 U
Xylenes, Total	0.26	100	0.34 U	**2.6**	0.038	0.0041 U	0.16 U	0.0022 U	0.0022 U	0.003 U	**7.2**	**2.1 J**	0.12 U	0.0032 U	0.23 U	0.0019 U	0.002 U	0.2 U	0.004 U	0.0041 U	0.0037 U	0.034 J	0.0018 U	0.0021 U	0.0023 U	0.0018 U	**0.49 J**	0.28 U	0.1 J	0.0017 U
SVOCs (mg/kg)																														
2-Methylnaphthalene	~	~	0.072 J	20	0.52	0.36 U	0.26	0.27 U	0.26	0.33 U	0.98	0.18 J	0.099 J	0.28 U	0.065 J	0.23 U	0.049 J	0.06 J	0.35 U	0.37 U	0.33 U	0.25 U	0.23 U	0.09 J	0.081 J	0.24 U	0.036 J	0.051 J	0.051 J	0.094 J
3-Methylphenol/4-Methylphenol	0.33	100	0.26 U	1.9 U	**0.5**	0.44 U	0.1 J	0.14 J	0.1 J	0.4 U	0.042 J	**0.95**	0.28	0.34 U	0.32 U	0.28 U	0.18 J	0.043 J	0.42 U	0.44 U	0.39 U	0.051 J	0.079 J	0.14 J	0.3 U	0.29 U	0.26 U	0.14 J	**0.38**	0.03 J
4-Chloroaniline	~	~	0.18 U	1.3 U	0.22 U	0.3 U	0.21 U	0.23 U	0.21 U	0.28 U	0.19 UJ	0.23 U	0.19 U	0.24 UJ	0.22 U	0.19 U	0.2 U	0.2 U	0.29 U	0.31 U	0.27 U	0.21 U	0.19 U	0.2 U	0.21 U	0.2 U	0.18 U	0.3 U	0.25 U	0.19 U
Acenaphthene	20	100	0.29	1 U	0.15 J	0.24 U	0.89	0.04 J	0.28	0.22 U	0.061 J	0.18	0.29	0.041 J	0.26 J	0.15 U	0.15 J	0.076 J	0.24 U	0.25 U	0.22 U	0.17 U	0.15 U	0.18	0.055 J	0.16 U	0.018 J	0.04 J	0.08 J	0.16
Acenaphthylene	100	100	0.035 J	1 U	0.077 J	0.24 U	0.44	0.18 U	0.2	0.22 U	0.077 J	0.24	0.052 J	0.19 U	0.046 J	0.15 U	0.16 U	0.16	0.24 U	0.25 U	0.22 U	0.18	0.15 U	0.054 J	0.035 J	0.16 U	0.056 J	0.14 J	0.085 J	0.26
Acetophenone	~	~	0.18 U	1.3 U	0.22 U	0.3 U	0.21 U	0.23 U	0.21 U	0.28 U	0.19 U	0.23 U	0.19 U	0.24 U	0.034 J	0.19 U	0.2 U	0.076 J	0.29 U	0.31 U	0.27 U	0.21 U	0.19 U	0.2 U	0.21 U	0.2 U	0.17 J	0.3 U	0.063 J	0.18 J
Anthracene	100	100	0.52	2.6	0.33	0.18 U	1.8	0.046 J	0.65	0.17 U	0.23	0.75	0.5	0.082 J	0.55 J	0.04 J	0.32	0.71	0.18 U	0.18 U	0.16 U	0.12	0.11 U	0.37	0.12	0.12 U	0.12	0.31	0.34	0.77
Benzaldehyde	~	~	0.24 U	1.7 U	0.085 J	0.4 U	0.28 U	0.3 U	0.28 U	0.37 U	0.26 U	0.3 U	0.26 U	0.084 J	0.22 J	0.25 U	0.26 U	0.63	0.39 U	0.41 U	0.36 U	0.28 U	0.25 U	0.26 U	0.28 U	0.26 U	0.24 U	0.4 U	0.33 U	0.25 U
Benzo(a)anthracene	1	1	**1.2**	0.91	0.96	0.18 U	**5.4**	0.078 J	0.68	0.17 U	0.68	**3**	0.85	0.25 J	**1.2 J**	0.17	0.42	**1.4**	0.18 U	0.18 U	0.16 U	0.95	0.063 J	0.62	0.33	0.12 U	0.31	**1.4**	0.93	**2**
Benzo(a)pyrene	1	1	1	0.69 J	0.87	0.24 U	**5.1**	0.083 J	0.62	0.22 U	0.66	**3.3**	0.73	0.25 J	**1.1 J**	0.19	0.32	**1.2**	0.24 U	0.25 U	0.22 U	0.94	0.064 J	0.56	0.58	0.16 U	0.29	**1.3**	0.9	**2.1**
Benzo(b)fluoranthene	1	1	**1.3**	0.41 J	0.85	0.18 U	**6.5**	0.077 J	0.71	0.17 U	0.89	**4**	0.87	0.31 J	**1.5 J**	0.23	0.39	**1.5**	0.18 U	0.18 U	0.16 U	**1.1**	0.073 J	0.68	0.64	0.12 U	0.38	**1.6**	**1.1**	**2.6**
Benzo(ghi)perylene	100	100	0.52	1 U	0.52	0.24 U	2.8	0.054 J	0.33	0.22 U	0.54	1.8	0.36	0.14 J	0.69 J	0.095 J	0.13 J	0.59	0.24 U	0.25 U	0.22 U	0.49	0.039 J	0.27	0.52	0.16 U	0.18	0.66	0.56	1.3
Benzo(k)fluoranthene	0.8	3.9	0.45	0.78 U	0.3	0.18 U	**2.1**	0.14 U	0.26	0.17 U	0.26	**1.3**	0.35	0.12 J	0.42 J	0.073 J	0.15	0.48	0.18 U	0.18 U	0.16 U	0.42	0.11 U	0.21	0.22	0.12 U	0.12	0.62	0.37	0.78
Benzoic Acid	~	~	0.59 U	4.2 U	0.7 U	0.98 U	0.7 UJ	0.74 U	0.68 U	0.9 UJ	0.63 UJ	0.75 UJ	0.63 UJ	0.76 UJ	0.73 U	0.62 UJ	0.64 UJ	0.65 UJ	0.95 U	1 UJ	0.88 U	0.68 UJ	0.62 UJ	0.65 UJ	0.68 U	0.65 U	0.58 U	0.98 U	0.81 U	0.61 U
Biphenyl	~	~	0.42 U	2 J	0.078 J	0.69 U	0.096 J	0.52 U	0.48 U	0.63 U	0.2 J	0.058 J	0.44 U	0.54 U	0.51 U	0.44 U	0.45 U	0.46 U	0.67 U	0.7 U	0.62 U	0.48 U	0.44 U	0.46 U	0.48 U	0.46 U	0.41 U	0.69 U	0.57 U	0.43 U
Bis(2-ethylhexyl)phthalate	~	~	0.18 U	1.3 U	0.22 U	0.3 U	0.21 U	0.23 U	0.21 U	0.28 U	0.19 U	0.23 U	0.19 U	0.24 U	0.22 U	0.19 U	0.2 U	0.2 U	0.29 U	0.31 U	0.27 U	0.12 J	0.19 U	0.2 U	0.21 U	0.2 U	0.29	0.3 U	0.44	0.19
Carbazole	~	~	0.27	1.3 U	0.11 J	0.3 U	0.87	0.23 U	0.21 U	0.28 U	0.074 J	0.27	0.25	0.051 J	0.27	0.029 J	0.13 J	0.13 J	0.29 U	0.31 U	0.27 U	0.044 J	0.19 U	0.17 J	0.21 U	0.2 U	0.047 J	0.12 J	0.21 J	0.4
Chrysene	1	3.9	**1.2**	**1.2**	1	0.18 U	**5.3**	0.079 J	0.81	0.17 U	0.74	**3**	0.8	0.26 J	**1.2 J**	0.16	0.37	**1.3**	0.18 U	0.18 U	0.16 U	0.88	0.059 J	0.57	0.35	0.12 U	0.33	**1.3**	0.88	**1.9**
Dibenzo(a,h)anthracene	0.33	0.33	0.15	0.78 U	0.17	0.18 U	**0.69**	0.14 U	0.092 J	0.17 U	0.13	**0.54**	0.1 J	0.036 J	0.18 J	0.035 J	0.052 J	0.17	0.18 U	0.18 U	0.16 U	0.15	0.11 U	0.082 J	0.12	0.12 U	0.05 J	0.19	0.15	**0.35**
Dibenzofuran	7	59	0.22	1.7	0.13 J	0.3 U	0.58	0.023 J	0.26	0.28 U	0.078 J	0.19 J	0.2	0.03 J	0.2 J	0.19 U	0.1 J	0.14 J	0.29 U	0.31 U	0.27 U	0.022 J	0.19 U	0.14 J	0.091 J	0.2 U	0.026 J	0.068 J	0.067 J	0.16 J
Di-n-butylphthalate	~	~	0.18 U	1.3 U	0.22 U	0.3 U	0.21 U	0.23 U	0.21 U	0.28 U	0.19 U	0.23 U	0.19 U	0.24 U	0.22 U	0.19 U	0.2 U	0.2 U	0.29 U	0.31 U	0.27 U	0.21 U	0.19 U	0.2 U	0.21 U	0.2 U	0.049 J	0.3 U	0.25 U	0.056 J
Fluoranthene	100	100	2.6	1.3	1.4	0.18 U	14	0.12 J	1.5	0.17 U	1.3	4.6	2.1	0.53 J	2.9 J	0.24	0.85	2.8	0.18 U	0.18 U	0.16 U	1.6	0.11	1.2	0.12 U	0.12 U	0.7	2.7	2.2	4.6
Fluorene	30	100	0.23	1.3 U	0.25	0.3 U	0.86	0.037 J	0.42	0.28 U	0.067 J	0.29	0.32	0.041 J	0.26	0.19 U	0.18 J	0.17 J	0.29 U	0.31 U	0.27 U	0.025 J	0.19 U	0.21	0.059 J	0.2 U	0.034 J	0.047 J	0.089 J	0.21
Hexachloroethane	~	~	0.15 U	1 U	0.17 U	0.24 U	0.17 U	0.18 U	0.17 U	0.22 U	0.062 J	0.18 U	0.15 U	0.19 U	0.18 U	0.15 U	0.16 U	0.16 U	0.24 U	0.25 U	0.22 U	0.17 U	0.15 U	0.16 U	0.17 U	0.16 U	0.14 U	0.24 U	0.2 U	0.15 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	**0.59**	1 U	0.4	0.24 U	**3.2**	0.046 J	0.34	0.22 U	**0.52**	**2**	0.42	0.16 J	**0.76 J**	0.11 J	0.16	**0.69**	0.24 U	0.25 U	0.22 U	**0.57**	0.042 J	0.31	**0.55**	0.16 U	0.19	**0.77**	**0.61**	**1.4**
Naphthalene	12	100	0.11 J	3.8	0.25	0.3 U	0.56	0.23 U	0.24	0.28 U	0.5	0.53	0.22	0.042 J	0.16 J	0.19 U	0.074 J	0.13 J	0.29 U	0.31 U	0.27 U	0.082 J	0.19 U	0.17 J	0.83	0.2 U	0.032 J	0.13 J	0.077 J	0.17 J
Phenanthrene	100	100	2.8	8.1	1.2	0.18 U	12	0.1 J	1.6	0.17 U	0.92	2.2	2	0.43 J	3 J	0.16	0.98	2.2	0.18 U	0.18 U	0.16 U	0.27	0.1 J	1.2	0.4	0.12 U	0.55	1.3	1.4	3.1
Phenol	0.33	100	0.18 U	1.3 U	0.065 J	0.3 U	0.21 U	0.23 U	0.21 U	0.28 U	0.19 U	0.33	0.19 U	0.24 U	0.22 U	0.19 U	0.2 U	0.2 U	0.29 U	0.31 U	0.27 U	0.21 U	0.19 U	0.031 J	0.21 U	0.2 U	0.18 U	0.3 U	0.25 U	0.19 U
Pyrene	100	100	2.2	6.1	1.4	0.18 U	12	0.13 J	1.6	0.17 U	1.4	4.2	1.6	0.46 J	2.4 J	0.21	0.69	2.3	0.18 U	0.18 U	0.16 U	1.5	0.099 J	1	0.38	0.12 U	0.6	2.4	1.8	3.9
Total Metals (mg/kg)																														
Aluminum, Total	~	~	1130	12600	3910	12000	7440	3530	3000	12200	2450	2320	6800	4090	6500	7320	2940	1190	10700	13000	11700	3700	4460	5580	5020	6250	937	5270 J	2660	5850
Antimony, Total	~	~	0.761 J	6.29 U	5.03 U	7.14 U	4.87 U	5.45 U	4.95 U	6.57 U	3.84 J	9.79	4.62 U	5.73 U	15 J	4.61 U	4.78 U	10.2	6.73 U	7.2 U	6.55 U	2.98 J	4.66 U	4.84 U	2.04 J	4.69 U	4.27 U	3.58 J	1.23 J	4.39 U
Arsenic, Total	13	16	5.26	**19.2**	6.14	10.9	**30.8**	**35.9**	**20.6**	8.62	**20.8**	**86**	2.28	9.39 J	**19.8 J**	4.99	**27.7**	**31.9**	8.31	11	9.46	**32.1 J**	**95.4**	7.78	6.95	**23.1**	4.62	**28.9 J**	**24.4**	9.82
Barium, Total	350	400	76.4	128	122	21.6	182	112	150	21.4	**672**	99.3	35.3	219	**370**	63.9	177	292	28.9	35.1	21.2	207	99.5	53.8	87.1	69	69.5	175 J	150	149
Beryllium, Total	7.2	72	0.135 J	0.629	0.161 J	0.514 J	0.244 J	0.152 J	0.347 J	0.499 J	0.301 J	0.15 J	0.24 J	0.435 J	0.571	0.387 J	0.162 J	0.048 J	0.444 J	0.547 J	0.485 J	0.28 J	0.233 J	0.29 J	2.27	0.253 J	0.034 J	0.146 J	0.07 J	0.272 J
Cadmium, Total	2.5	4.3	0.304 J	**37.2**	0.844 J	1.76	**7.99**	1.1	**2.66**	1.51	**9.17 J**	**18**	0.61 J	0.516 J	1.09	0.82 J	2.34	1.93	1.39	1.8	1.57	**3.3 J**	2.24	0.958 J	0.586 J	0.872 J	0.196 J	**7.86 J**	1.3	1.06
Calcium, Total	~	~	506	13900	5060	2070	6640	8120	16900	1700	4130	21700	985	3660	4850	1960	11100	2590	4640	2940	2760	10600	5660	5690	15400	6040	1020	33300 J	24600	9710
Chromium, Hexavalent	1	110	0.9 U	1.3 U	1 U	1 J	1 UJ	1.1 U	1 U	1.3 U	0.95 UJ	1.1 U	0.94 U	1.2 U	1.1 U	0.94 U	0.97 U	0.98 U	1.4 U	**1.5 UJ**	1.3 U	1 UJ	0.93 U	0.97 U	1 U	0.98 U	0.88 U	1.5 U	1.2 U	0.91 U
Chromium, Trivalent	30	180	12	13	13	25 J	15	12	7.8	24	22	10	14	16	26	17	16	**74**	23	28	24	**74**	15	15	**2400**	**69**	7.3	**95**	**67**	**34**
Chromium, Total	~	~	12.5	12.9	13.3	26.2	14.9	11.8	7.75	24.5	21.5 J	10.1 J	14 J	15.9 J	26.2 J	17.3 J	16.5 J	73.9	23	28	23.7	73.7 J	14.7 J	15 J	2400	69.2	7.3	95	67.1	33.6
Cobalt, Total	~	~	2.11	12.2	5.02	9.91	42.5	6.08	6.6	10.1	5.83	30.5	6	16.2	8.1	6.94	12.4	2.41	9.12	11.2	9.61	9.59 J	8.4	5.5	8.03	8.26	4.18	4.76	4.35	6.52
Copper, Total	50	270	**118**	**53.7**	41.6	14.8	**646**	44.7	**64.2**	14.1	**321**	**1250**	18.2	**51.7 J**	**195 J**	23.6	**74.5**	**298**	23.7	31.5	14.1	**342**	**499**	**71**	**162**	48.2	24.1	**1030 J**	**216**	**93.9**
Cyanide, Total	27	27	0.4 J	1.5 UJ	1.4 J	1.8 UJ	1.2 UJ	1.3 UJ	1.2 UJ	1.6 UJ	2.5 J	1.3 J	1.1 UJ	1.3 UJ	1.6 J	1.1 UJ	0.3 J	0.98 J	1.6 UJ	1.8 UJ	1.6 UJ	23 J	0.67 J	1.1 J	2.5 J	1.2 UJ	0.52 J	0.96 J	1.5 UJ	0.29 J
Iron, Total	~	~	5490	28500	13900	30400	69000	19600	27100	27200	23300 J	345000 J	11300 J	5780 J	10100 J	15000 J	34600 J	24600	24800	30800	28200	39400 J	34300 J	13900 J	9250	17000	3370	42700	15400	12500
Lead, Total	63	400	**158**	**659**	**426**	14.6	**272**	**295**	**666**	13.8	**1640 J**	**1340 J**	46.7 J	**1010 J**	**5630 J**	**96.2 J**	**417 J**	**1630**	32	43.2	13.9	**698 J**	**671 J**	**238 J**	**348**	**140**	45.3	**487**	**193**	**300**
Magnesium, Total	~	~	130	805	1360	5570	1620	1280	1380	5370	455 J	1130 J	2230 J	351 J	508 J	1860 J	1400 J	179	4760	5640	5270	1730 J	2060 J	2820 J	551	1690	90.1	1020 J	2520	1950
Manganese, Total	1600	2000	55.2	207	251	381	370	375	558	346	221	804	148	164	106	278	338	35.1	299	376	338	259	249	186	48.7	189	23.1	247 J	104	159
Mercury, Total	0.18	0.81	**1.5**	**1.5**	**3.8**	0.04 J	**1.3**	**3.5**	**2.1**	0.04 J	**1.7**	**160**	**0.62**	**1.9 J**	**4.9 J**	0.14	**2.1**	**28**	**0.45**	**0.65**	0.06 J	**2.5**	**6.8**	**0.58**	**1.1**	**0.58**	**68**	**2.6 J**	**43**	**3.7**
Nickel, Total	30	310	5	**295**	12.2	20.4	**60.9**	11.4	**44**	21.2	23.4	**60.8**	9.83	21.2	16	11.5	**63.5**	**39.6**	26.7	**35.5**	19.6	**32**	**47**	12.3	17.2	11.8	7.01	**161 J**	28.1	19.2
Potassium, Total	~	~	124 J	859	625	2490	584	632	332	2410	331	63.7 J	613	428	546	748	361	438	2150	2520	2340	744 J	634	1040	272	685	276	1380 J	875	1010
Selenium, Total	3.9	180	0.516 J	**6.7**	0.543 J	0.4 J	0.75 J	0.436 J	0.674 J	2.63 U	1.9	2.15 U	1.85 U	1.01 J	1.76 J	1.84 U	1.38 J	3.51	2.69 U	2.88 U	2.62 U	1.42 J	0.821 J	0.3 J	3.77	0.675 J	0.735 J	**4.21**	2.2 J	0.676 J
Silver, Total	2	180	0.846 U	1.26 U	1 U	1.43 U	0.974 U	1.09 U	0.991 U	1.31 U	0.274 J	0.645 J	0.924 U	0.481 J	0.83 J	0.922 U	0.955 U	**57.8**	1.35 U	1.44 U	1.31 U	1 U	1.89	0.968 U	0.993 U	0.938 U	0.854 U	**20.7 J**	**3.69**	1.42
Sodium, Total	~	~	32.6 J	384	183 J	1900	49.2 J	174 J	219	1300	94.9 J	216	65 J	186 J	256	99.5 J	169 J	100 J	1130	1330	1400	157 J	383	1320	178 J	75.4 J	72.9 J	352 J	182 J	444
Thallium, Total	~	~	1.69 U	2.52 U	2.01 U	2.86 U	1.95 U	2.18 U	1.98 U	2.63 U	1.83 U	1.84 J	1.85 U	2.29 U	2.15 U	1.84 U	1.91 U	1.9 U	2.69 U	2.88 U	2.62 U	2 UJ	1.87 U	1.94 U	1.99 U	1.88 U	1.71 U	2.92 U	2.34 U	1.76 U
Vanadium, Total	~	~	6.67	31.4	19	31.3	25.6	16.3	26.5	28.8	12.6	20.8	22.1	20.9	34.2	27.9	17.1	20	27.4	32	28.4	28.6 J	25.4	18.8	8.71	21.8	11.6	30.4 J	20.4	20.7
Zinc, Total	109	10000	32.7	**1520**	92.4	68.9	**7990**	**126**	**304**	65.4	**2020 J**	**632 J**	35.6 J	**1320 J**	**2240 J**	46 J	**1130 J**	**648**	91.6	**133**	62.4	**427 J**	**354 J**	**118 J**	**323**	70.6	25.6	**949 J**	**203**	**214**
General Chemistry (%)																														
Solids, Total	~	~	89.1	63.4	76.7	54.3	77.4	71.8	79.6	59.3	84.2	71.6	85.5	69.5	72.4	84.7	82.3	81.3	56.3	52.8	60.8	79.3	85.6	82.2	78.6	81.5	90.8	54.2	65.5	88

Notes:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 New York Codes, Rules, and Regulations (6NYCRR) Part 375 Unrestricted Use, and Restricted Use Restricted-Residential Soil Cleanup Objectives (SCOs).
2. Only detected compounds are shown in the table.
3. Concentrations above Unrestricted Use SCOs are bolded.
4. Concentrations above Restricted Use Restricted-Residential SCOs are bolded and shaded.
5. SODUP01_112017 is a duplicate of the parent sample 16B5_12-13.
6. SODUP02_112117 is a duplicate of the parent sample 16B6_3-4.
7. mg/kg = miligrams per kilogram
8. ~ = No criteria exists for this analyte.
9. bgs = below grade surface
10. VOCs = volatile organic compounds
11. SVOCs = semivolatile organic compounds

Qualifers:

J = Analyte detected at or above the method detection limit but below the reporting limit - data is estimated
U = Analyte not detected at or above the level indicated
UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.

Table 4B
Soil Sample Results Summary - NAPL Delineation
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Location	NYSDEC Part 375 Unrestricted Use SCOs	NYSDEC Part 375 Restricted Use Restricted-Residential SCOs	16B9		16B10		16B11	
Sample ID			16B9_10-11		16B10_7-8		16B11_7-8	
Sampling Date			11/20/2017		11/20/2017		11/20/2017	
Lab Sample ID			L1742789-17		L1742789-21		L1742789-07	
Sample Depth (feet bgs)			10 to 11		7 to 8		7 to 8	
VOCs (mg/kg)								
1,1-Dichloroethane	0.27	26	0.15	U	0.037	J	0.00059	J
1,2,4,5-Tetramethylbenzene	~	~	0.15	J	0.12	J	0.0045	U
2-Butanone	0.12	100	1	U	0.76	U	0.0072	J
Acetone	0.05	100	1	U	**0.2**	J	0.036	
Bromoform	~	~	0.4	UJ	0.3	U	0.0045	U
Carbon disulfide	~	~	1	UJ	0.76	U	0.0013	J
cis-1,2-Dichloroethene	0.25	100	0.069	J	**8.7**		0.0057	
Dibromochloromethane	~	~	0.1	UJ	0.076	U	0.0011	U
Ethylbenzene	1	41	0.1	U	0.076	U	0.00024	J
Isopropylbenzene	~	~	0.1	U	0.017	J	0.0011	U
Methyl Acetate	~	~	0.46	J	0.25	J	0.022	U
Methyl cyclohexane	~	~	0.098	J	0.037	J	0.0045	U
Naphthalene	12	100	0.09	J	0.046	J	0.0056	U
n-Butylbenzene	12	100	0.025	J	0.025	J	0.0011	U
n-Propylbenzene	3.9	100	0.1	U	0.023	J	0.0011	U
p-Isopropyltoluene	~	~	0.057	J	0.17		0.0011	U
sec-Butylbenzene	11	100	0.039	J	0.032	J	0.0011	U
Tetrachloroethene	1.3	19	0.18		0.076	U	0.0011	U
Toluene	0.7	100	0.15	U	0.027	J	0.0017	U
trans-1,2-Dichloroethene	0.19	100	0.15	U	0.068	J	0.0017	U
Trichloroethene	0.47	21	0.46		**0.51**		0.0011	U
Vinyl chloride	0.02	0.9	0.2	U	**0.59**		0.014	
SVOCs (mg/kg)								
2-Methylnaphthalene	~	~	0.12	J	1.4		0.077	J
3-Methylphenol/4-Methylphenol	0.33	100	0.094	J	**2.7**		0.16	J
Acenaphthene	20	100	0.031	J	3.1		0.1	J
Acenaphthylene	100	100	0.057	J	0.11	J	0.031	J
Anthracene	100	100	0.12	J	0.5		0.31	
Benzaldehyde	~	~	0.091	J	0.3	J	0.26	U
Benzo(a)anthracene	1	1	0.36		0.44		0.57	
Benzo(a)pyrene	1	1	0.32		0.38		0.48	
Benzo(b)fluoranthene	1	1	0.41		0.49		0.6	
Benzo(ghi)perylene	100	100	0.18	J	0.23		0.27	
Benzo(k)fluoranthene	0.8	3.9	0.14		0.17		0.22	
Biphenyl	~	~	0.54	U	0.18	J	0.45	U
Bis(2-ethylhexyl)phthalate	~	~	0.24	U	0.24	U	0.19	J
Carbazole	~	~	0.071	J	0.19	J	0.12	J
Chrysene	1	3.9	0.37		0.46		0.54	
Dibenzo(a,h)anthracene	0.33	0.33	0.055	J	0.061	J	0.068	J
Dibenzofuran	7	59	0.066	J	0.39		0.12	J
Fluoranthene	100	100	0.83		1.2		1.4	
Fluorene	30	100	0.073	J	1.6		0.17	J
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.2		0.24		0.3	
Naphthalene	12	100	0.18	J	5.4		0.14	J
Phenanthrene	100	100	0.64		1.6		1.4	
Phenol	0.33	100	0.24	U	**0.44**		0.2	U
Pyrene	100	100	0.69		1		1.1	
Herbicides (mg/kg)								
Total Herbicides	~	~	ND		ND		ND	
PCBs (mg/kg)								
PCBs, Total	0.1	1	ND		ND		ND	
Pesticides (mg/kg)								
4,4'-DDT	0.0033	7.9	0.00431	U	**0.00469**		0.00351	U
Total Metals (mg/kg)								
Aluminum, Total	~	~	3530		3480		3740	
Antimony, Total	~	~	4.04	J	5.69	U	4.72	U
Arsenic, Total	13	16	**117**		**91.2**		**33.9**	
Barium, Total	350	400	172		170		175	
Beryllium, Total	7.2	72	0.228	J	0.239	J	0.245	J
Cadmium, Total	2.5	4.3	1.42		1	J	1.28	
Calcium, Total	~	~	15800		10000		5960	
Chromium, Hexavalent	1	110	**1.2**	UJ	1.2	U	0.96	UJ
Chromium, Trivalent	30	180	10		7		15	
Chromium, Total	~	~	10.4		7.01		15.1	
Cobalt, Total	~	~	6.07		3.36		6.14	
Copper, Total	50	270	49.5		24.1		**439**	
Cyanide, Total	27	27	1.4	UJ	1.3	U	1.1	J
Iron, Total	~	~	17800		8840		18300	
Lead, Total	63	400	**9410**		**509**		**828**	
Magnesium, Total	~	~	540		989		824	
Manganese, Total	1600	2000	159		197		411	
Mercury, Total	0.18	0.81	**3.4**		**2.7**		**9.6**	
Nickel, Total	30	310	13		6.53		**30.6**	
Potassium, Total	~	~	409		523		471	
Selenium, Total	3.9	180	3.08		1.21	J	0.943	J
Silver, Total	2	180	1.78		0.41	J	1.13	
Sodium, Total	~	~	303		373		185	J
Vanadium, Total	~	~	15.3		15.3		20	
Zinc, Total	109	10000	**391**		**537**		**552**	
EPH (mg/kg)								
Total EPH	~	~	230		278		1220	
General Chemistry (%)								
Solids, Total	~	~	68.9		69.2		83	

Notes:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Title 6 New York Codes, Rules, and Regulations (6NYCRR) Part 375 Unrestricted Use and Restricted Use Restricted-Residential Soil Cleanup Objectives (SCOs).
2. Only detected compounds are shown in the table.
3. Concentrations above Unrestricted Use SCOs are bolded
4. Concentrations above Restricted Use Restricted-Residential SCOs are bolded and shaded.
5. mg/kg = miligrams per kilogram
6. ~ = No criteria exists for this analyte.
7. bgs = below grade surface
8. ND = Not Detected
9. NAPL = Non-Aqueous Phase Liquid
10. VOCs = volatile organic compounds
11. SVOCs = semivolatile organic compounds
12. PCBs = polychlorinated biphenyls
13. EPH = Extractable Petroleum Hydrocarbons

Qualifers:

J = Analyte detected at or above the method detection limit but below the reporting limit - data is estimated

U = Analyte not detected at or above the level indicated

UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.

Table 5
Groundwater Sample Results Summary
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Location	NYSDEC	MW3_112917		MW4_112917		16MW1_112917		16MW2_112917		GWDUP01_112917		16MW3_112917	
Sampling Date	**TOGS**	**11/29/2017**		**11/29/2017**		**11/29/2017**		**11/29/2017**		**11/29/2017**		**11/29/2017**	
Lab Sample ID	**SGVs**	**L1743740-01**		**L1743740-06**		**L1743740-04**		**L1743740-03**		**L1743740-05**		**L1743740-02**	
VOCs (µg/L)													
1,1-Dichloroethane	5	2.5	U	2.2	J	2.5	U	2.5	U	2.5	U	1.6	J
1,2,4,5-Tetramethylbenzene	5	2.6		2	U	2	U	2	U	2	U	2	U
1,2,4-Trimethylbenzene	5	1.5	J	2.5	U	1.5	J	2.5	U	2.5	U	2.5	U
1,3,5-Trimethylbenzene	5	0.77	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Chloroethylvinyl ether	~	10	R	10	R	10	R	10	R	10	R	10	R
Acetone	50	5	U	5	U	5	U	5	U	5	U	2.4	J
Benzene	1	0.21	J	0.5	U	0.5	U	0.5	U	0.5	U	0.93	
Bromomethane	5	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Carbon tetrachloride	5	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
cis-1,2-Dichloroethene	5	2.8		**40**		2.5	U	2.5	U	0.73	J	**8.6**	
Cyclohexane	~	0.96	J	10	U	10	U	10	U	10	U	10	U
Freon-113	5	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Methyl cyclohexane	~	1.3	J	10	U	10	U	10	U	10	U	10	U
Naphthalene	10	7.8		2.5	U	**17**		2.5	U	0.72	J	0.73	J
o-Xylene	5	0.93	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p-Ethyltoluene	~	0.98	J	2	U	2	U	2	U	2	U	2	U
Tert-Butyl Alcohol	~	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Tetrachloroethene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.23	J	2.7	
trans-1,2-Dichloroethene	5	2.3	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Trichloroethene	5	0.5	U	**6.8**		0.5	U	4.5		**5.5**		**21**	
Trichlorofluoromethane	5	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Vinyl chloride	2	**5.1**		**4**		1	U	1	U	1	U	0.19	J
Xylenes, Total	5	0.93	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
SVOCs (µg/L)													
2,6-Dinitrotoluene	5	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	UJ
2-Methylnaphthalene	~	2.8		0.1	U	7.9		0.1	U	0.1	U	0.11	
2-Nitroaniline	5	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	UJ
2-Nitrophenol	~	10	UJ	10	UJ	10	UJ	10	UJ	10	U	10	UJ
Acenaphthene	20	0.84		0.1	U	0.84		0.04	J	0.04	J	0.36	
Acenaphthylene	~	0.26		0.1	U	0.08	J	0.1	U	0.1	U	0.06	J
Anthracene	50	0.12		0.1	U	0.12		0.04	J	0.05	J	0.22	
Benzo(a)anthracene	0.002	0.1	U	0.1	U	**0.03**	J	**0.05**	J	**0.04**	J	**0.45**	
Benzo(a)pyrene	0.002	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	**0.41**	
Benzo(b)fluoranthene	0.002	0.1	U	0.1	U	**0.02**	J	**0.06**	J	**0.04**	J	**0.6**	
Benzo(ghi)perylene	~	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.39	
Benzo(k)fluoranthene	0.002	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	**0.2**	
Benzoic Acid	~	50	U	50	U	14	J	50	U	50	U	50	U
Biphenyl	~	2	U	2	U	1.1	J	2	U	2	U	2	U
Bis(2-chloroethyl)ether	1	**2**	UJ	**2**	UJ	**2**	UJ	**2**	UJ	2	U	**2**	UJ
Caprolactam	~	10	UJ	10	UJ	10	UJ	10	UJ	10	U	10	UJ
Chrysene	0.002	0.1	U	0.1	U	0.1	U	**0.05**	J	0.1	U	**0.48**	
Dibenzo(a,h)anthracene	~	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	J
Dibenzofuran	~	0.68	J	2	U	2	U	2	U	2	U	2	U
Fluoranthene	50	0.1	U	0.1	U	0.26		0.1		0.07	J	1	
Fluorene	50	1.1		0.05	J	0.43		0.1	U	0.1	U	0.25	
Hexachlorocyclopentadiene	5	**20**	UJ	**20**	UJ	**20**	UJ	**20**	UJ	**20**	UJ	**20**	UJ
Indeno(1,2,3-cd)pyrene	0.002	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	**0.39**	
Naphthalene	10	3.8		0.1	U	9.5		0.1	U	0.1	U	0.33	
Phenanthrene	50	0.28		0.04	J	2.5		0.09	J	0.07	J	1.1	
Pyrene	50	0.12		0.1	U	0.21		0.09	J	0.06	J	0.92	
Total Metals (µg/L)													
Aluminum, Total	~	12.6		74.2		28.5		735	J	1920	J	364	
Arsenic, Total	25	10.32		**120.6**		5.87		4.54	J	9.16	J	4.77	
Barium, Total	1000	157.5		192.4		248		263.2		317.9		136	
Beryllium, Total	3	0.5	U	0.5	U	0.5	U	0.5	U	0.15	J	0.5	U
Cadmium, Total	5	0.2	U	1.58		0.2	U	0.1	J	0.24		0.75	
Calcium, Total	~	114000		126000		216000		264000		261000		184000	
Chromium, Total	50	0.6	J	0.67	J	0.97	J	4	J	9.98	J	2.22	
Cobalt, Total	~	0.5	U	0.81		0.8		1.79	J	3.25	J	9.98	
Copper, Total	200	1.71		41.2		1.04		24.38	J	45.86	J	15.37	
Cyanide, Total	200	5	U	5	U	8		7		6		5	U
Iron, Total	300	**20300**		**26100**		**2760**		**6070**		**9620**		**3680**	
Lead, Total	25	0.34	J	14.92		3.5		**138.4**	J	**359**	J	**53.44**	
Magnesium, Total	35000	4840	J	12200	J	17800	J	20000	J	21300	J	8410	
Manganese, Total	300	**495.6**		**346.8**		**576.8**		**553.8**		**572.6**		**538**	
Mercury, Total	0.7	1	U	1	U	1	U	**7.3**	J	**20.05**	J	0.7	J
Nickel, Total	100	3.26		36.83		6.75		8.3		11.19		**136.9**	
Potassium, Total	~	7560		18800		20200		17800		18900		11100	
Silver, Total	50	0.4	U	0.4	U	0.4	U	0.33	J	0.31	J	0.4	U
Sodium, Total	20000	14300		**40100**		**58600**		**60600**		**69700**		**25200**	
Thallium, Total	0.5	0.5	U	0.5	U	0.5	U	0.14	J	0.5	U	0.45	J
Vanadium, Total	~	5	U	5	U	5	U	3.97	J	9.12		2.13	J
Zinc, Total	2000	10	U	378.3		4.59	J	48.6		102.1		**3294**	
Dissolved Metals (µg/L)													
Aluminum, Dissolved	~	10		9.62	J	5.42	J	7.17	J	4.61	J	8.47	J
Antimony, Dissolved	3	0.76	J	4	U	4	U	4	U	0.65	J	0.97	J
Arsenic, Dissolved	25	9.94		**112.1**		5.84		1.45		1.64		3.28	
Barium, Dissolved	1000	145.2		184.5		246.8		209.6		205.3		76.89	
Cadmium, Dissolved	5	0.2	U	0.34		0.2	U	0.2	U	0.2	U	0.41	
Calcium, Dissolved	~	107000		126000		213000		246000		246000		180000	
Chromium, Dissolved	50	0.001	U	0.001	U	0.001	U	2.51	J	0.001	U	0.001	U
Cobalt, Dissolved	~	0.5	U	0.81		0.83		1.02		0.99		9.32	
Copper, Dissolved	200	1	U	1.4		1	U	1	U	1	U	1.47	
Iron, Dissolved	300	**18600**		**20400**		**2830**		**4030**		**4120**		**3040**	
Lead, Dissolved	25	1	U	0.64	J	1	U	1	U	1	U	1.28	
Magnesium, Dissolved	35000	4520		12100		17300		19400		19600		7980	J
Manganese, Dissolved	300	**467.9**		**338.2**		**569.2**		**506**		**496**		**483.5**	
Nickel, Dissolved	100	3.23		34.5		7		2.81		2.68		**135.6**	
Potassium, Dissolved	~	7150		19300		20200		17200		17200		10400	
Sodium, Dissolved	20000	13500	J	**40400**		**57200**		**61700**		**62500**		**23400**	
Zinc, Dissolved	2000	10	U	285.2		10	U	10	U	10	U	**3236**	

Notes:

1. Groundwater sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA - Drinking Water.
2. Only detected compounds are shown in the table.
3. Concentrations detected above Class GA SGVs are bolded and shaded.
4. GWDUP01_112917 is a duplicate of the parent sample 16MW2_112917
5. µg/L = micrograms per Liter
6. ~ = Criterion does not exist.
7. VOCs = volatile organic compounds
8. SVOCs = semivolatile organic compounds

Qualifers:

J = Analyte detected at or above the method detection limit but below the reporting limit; therefore data is estimated

U = Analyte not detected at or above the level indicated

UJ = The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.

R = The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Table 6
Soil Vapor Sample Results Summary
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Location	**SG-1**	**SG-2**	**SG-3**	**SG-4**	**SG-5**	**SG-6**
Sampling Date	**7/28/2015**	**7/28/2015**	**7/28/2015**	**7/28/2015**	**7/28/2015**	**7/28/2015**
VOCs ($\mu g/m^3$)						
1,1,1,2-Tetrachloroethane	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
1,1,1-Trichloroethane	29.5	6,000	1.42	205	78.5	154
1,1,2,2-Tetrachloroethane	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
1,1,2-Trichloroethane	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
1,1-Dichloroethane	736	2,340	32.2	5.82	< 1.00	< 1.00
1,1-Dichloroethene	1,310	1,180	< 1.00	1,240	< 1.00	< 1.00
1,2,4-Trichlorobenzene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
1,2,4-Trimethylbenzene	13.6	17.4	9.04	17.1	15.2	13
1,3,5-Trimethylbenzene	3.96	5.45	13.8	5.31	4.39	3.92
1,3-Butadiene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
1,3-Dichlorobenzene	20.8	26.4	6.67	27.6	8.05	3.4
1,4-Dichlorobenzene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
1,4-Dioxane	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
2-Hexanone	< 1.00	68.4	< 1.00	< 1.00	238	9.95
4-Ethyltoluene	3.33	3.04	7.96	3.27	3.72	3.11
4-Isopropyltoluene	4.12	< 1.00	2.89	< 1.00	3.62	3.34
4-Methyl-2-pentanone	< 1.00	< 1.00	< 1.00	3.5	< 1.00	1.78
Acetone	6,430	2,230	2,210	1,470	3,490	153
Acrylonitrile	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Benzene	101	18.6	20.3	22.9	5.3	5.4
Benzyl Chloride	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Bromodichloromethane	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Bromoform	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Bromomethane	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Carbon Disulfide	97.7	17.1	10	101	18.1	< 1.00
Carbon Tetrachloride	< 0.25	0.8	0.28	6,350	6.66	0.31
Chlorobenzene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Chloroethane	< 1.00	11	25.9	< 1.00	< 1.00	< 1.00
Chloroform	< 1.00	162	1.21	1,950	26.8	< 1.00
Chloromethane	< 1.00	< 1.00	< 1.00	1.7	< 1.00	< 1.00
cis-1,2-Dichloroethene	11,000	10,500	40.8	6,260	21.8	< 1.00
cis-1,3-Dichloropropene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Cyclohexane	< 1.00	10.9	344	< 1.00	< 1.00	2.07
Dibromochloromethane	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Dichlorodifluromethane	< 1.00	1.2	< 1.00	1.56	3.86	1.4
Ethanol	286	322	260	241	239	169
Ethyl Acetate	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Ethylbenzene	13	14	11.8	12.6	10.8	11.8
Heptane	1,120	16.5	311	12.1	41.8	7.58
Hexachlorobutadiene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Hexane	5,110	23.7	609	22.8	42.6	7.01
Isopropylalcohol	56	53.1	52.3	28.3	244	13.6
Isopropylbenzene	1.04	1.14	2.84	1.18	< 1.00	< 1.00
Xylene (m&p)	41	43.4	38.8	40.8	35.5	37.1
Methyl Ethyl Ketone	383	436	492	245	1,100	84.9
MTBE	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Methylene Chloride	219	43.4	6.28	64.2	7.19	4.17
n-Butylbenzene	2.44	< 1.00	< 1.00	< 1.00	1.73	1.22
Xylene (o)	19	17.8	17.2	16.7	13.9	14.4
Propylene	< 1.00	< 1.00	< 1.00	< 1.00	125	< 1.00
sec-Butylbenzene	< 1.00	< 1.00	4.22	< 1.00	< 1.00	< 1.00
Styrene	< 1.00	2.28	< 1.00	2.15	1.8	1.79
Tetrachloroethene	7,730	109	203	1,790	87.4	77.3
Tetrahydrofuran	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Toluene	58	281	35.7	34.9	28.3	36.9
trans-1,2-Dichloroethene	2,710	666	22	539	3.53	< 1.00
trans-1,3-Dichloropropene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Trichloroethene	2,980	183,000	119	243,000	26,500	24.6
Trichlorofluoromethane	2.27	4.63	2.23	3.71	30.2	5.1
Trichlorotrifluoroethane	1.8	1.38	2.28	2.54	1.4	7.59
Vinyl Chloride	1,650	544	77.9	212	< 0.25	< 0.25
Total VOCs	42132.6	208,171.62	4,994.02	263,869.54	32,438.15	821.84

Notes:

1. Soil vapor analytical results shown in the data table are referenced from EBC's July 2015 Environmental Site Investigation.
2. Results detected below the reporting limit are shown in grey.
3. $\mu g/m^3$ = microgram per cubic meter
4. VOCs = Volatile Organic Compounds

Table 7
Quality Assurance/Quality Control Sample Results Summary
Remedial Investigation Report
215 North 10th Street, Brooklyn, New York
Langan Project No. 170482201
BCP Site No. C224229

Location	TB01_112017		TB02_112017		TB03_112117		TB04_112917		TB05_112917	
Sampling Date	11/20/2017		11/20/2017		11/21/2017		11/29/2017		11/29/2017	
Lab Sample ID	L1742789-24		L1742789-25		L1743026-12		L1743740-07		L1743740-08	
Sample Type	Soil Trip Blank		Soil Trip Blank		Soil Trip Blank		GW Trip Blank		GW Trip Blank	
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1,1-Trichloroethane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1,2,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
1,1-Dichloroethane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,3-Trichlorobenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,3-Trichloropropane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,4,5-Tetramethylbenzene	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,4-Trimethylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromo-3-chloropropane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromoethane	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	1	U	1	U	1	U	1	U	1	U
1,3,5-Trimethylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichlorobenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichloropropane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichloropropene, Total	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,4-Dioxane	250	U	250	U	250	U	250	U	250	U
2,2-Dichloropropane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Butanone	5	U	5	U	5	U	5	U	5	U
2-Chloroethylvinyl ether	10	UJ	10	UJ	10	R	10	R	10	R
2-Hexanone	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	5	U	5	U	5	U	5	U	5	U
Acetone	5	U	5	U	5	U	5	U	5	U
Acrolein	5	U	5	U	5	U	5	U	5	U
Acrylonitrile	5	U	5	U	5	U	5	U	5	U
Benzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromobenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromochloromethane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromodichloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	2	U	2	U	2	U	2	U	2	U
Bromomethane	2.5	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ
Carbon disulfide	5	U	5	U	5	U	5	U	5	U
Carbon tetrachloride	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ
Chlorobenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Chloroethane	2.5	UJ	2.5	UJ	2.5	U	2.5	U	2.5	U
Chloroform	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Chloromethane	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
cis-1,2-Dichloroethene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
cis-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Cyclohexane	10	U	10	U	10	U	10	U	10	U
Dibromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	5	U	5	U	5	U	5	U	5	U
Dichlorodifluoromethane	5	U	5	U	5	U	5	U	5	U
Ethyl ether	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Ethylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Freon-113	2.5	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ
Hexachlorobutadiene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Isopropylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Methyl Acetate	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	10	U	10	U	10	U	10	U	10	U
Methyl tert butyl ether	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Methylene chloride	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Naphthalene	2.5	U	2.5	UJ	2.5	UJ	2.5	U	2.5	U
n-Butylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
n-Propylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
o-Chlorotoluene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
o-Xylene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p/m-Xylene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p-Chlorotoluene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p-Diethylbenzene	2	U	2	U	2	U	2	U	2	U
p-Ethyltoluene	2	U	2	U	2	U	2	U	2	U
p-Isopropyltoluene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
sec-Butylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Styrene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Tert-Butyl Alcohol	10	U	10	U	10	U	10	UJ	10	UJ
tert-Butylbenzene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Tetrachloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
trans-1,2-Dichloroethene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
trans-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Trichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	2.5	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ
Vinyl acetate	5	U	5	U	5	U	5	U	5	U
Vinyl chloride	1	U	1	U	1	U	1	U	1	U
Xylenes, Total	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U

Notes:

1. Only detected compounds are show in the table.
2. GW = Groundwater
3. µg/L = microgram per liter
4. VOCs = volatile organic compounds

Qualifers:

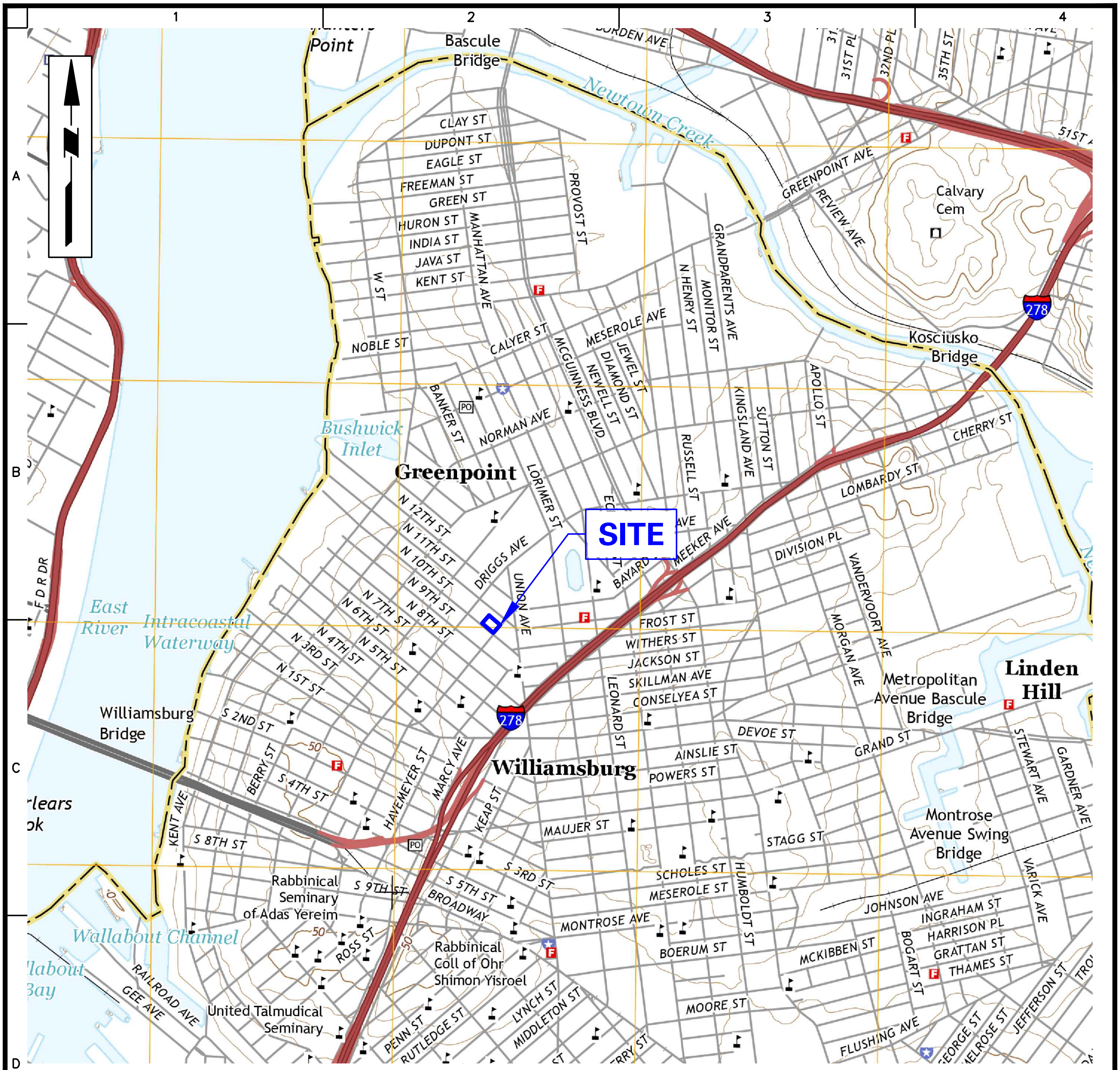
J = Analyte detected at or above the method detection limit but below the reporting limist; therefore the data is estimated

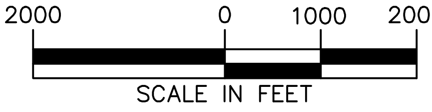
U = Analyte not detected at or above the level indicated

UJ = Validator Qualifier - The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.

R = Validator Qualifier - The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Figures





LEGEND:

▭ SITE BOUNDARY

GENERAL NOTE:

1. BASE MAP TAKEN FROM THE 2016 UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5-MINUTE TOPOGRAPHICAL QUADRANGLE MAP FOR BROOKLYN, NY.

LANGAN

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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project

215 NORTH 10TH STREET

BLOCK No. 2299, LOT No.21
BROOKLYN
KINGS NEW YORK

Figure Title

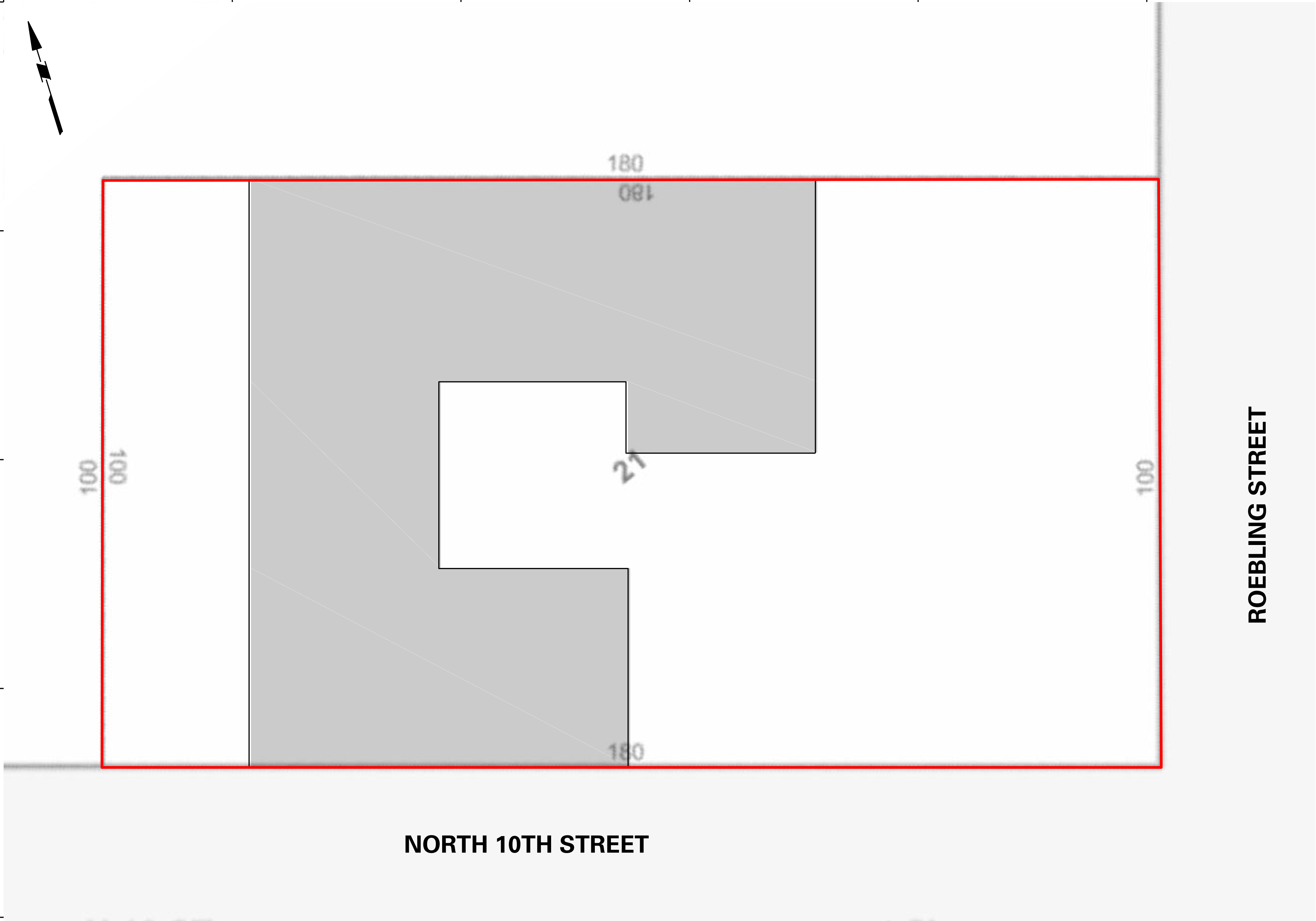
SITE LOCATION MAP

Project No.
170482201
Date
10/18/2017
Scale
1" = 2000'
Drawn By KN
Checked By AT
Submission Date
JANUARY 2018

Figure No.
1

Sheet 1 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figure 1 - SIte Location Map.dwg Date: 12/26/2017 Time: 12:00 User: knagotko Style Table: Langan.stb Layout: ANSIA-BP



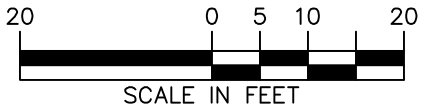
LEGEND:

🟥 APPROXIMATE BCP SITE BOUNDARY

▨ APPROXIMATE BUILDING BOUNDARIES

GENERAL NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. BCP = BROWNFIELD CLEANUP PROGRAM



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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project

215 NORTH 10TH STREET

BLOCK No. 2299, LOT No. 21
BROOKLYN
KINGS **NEW YORK**

Figure Title

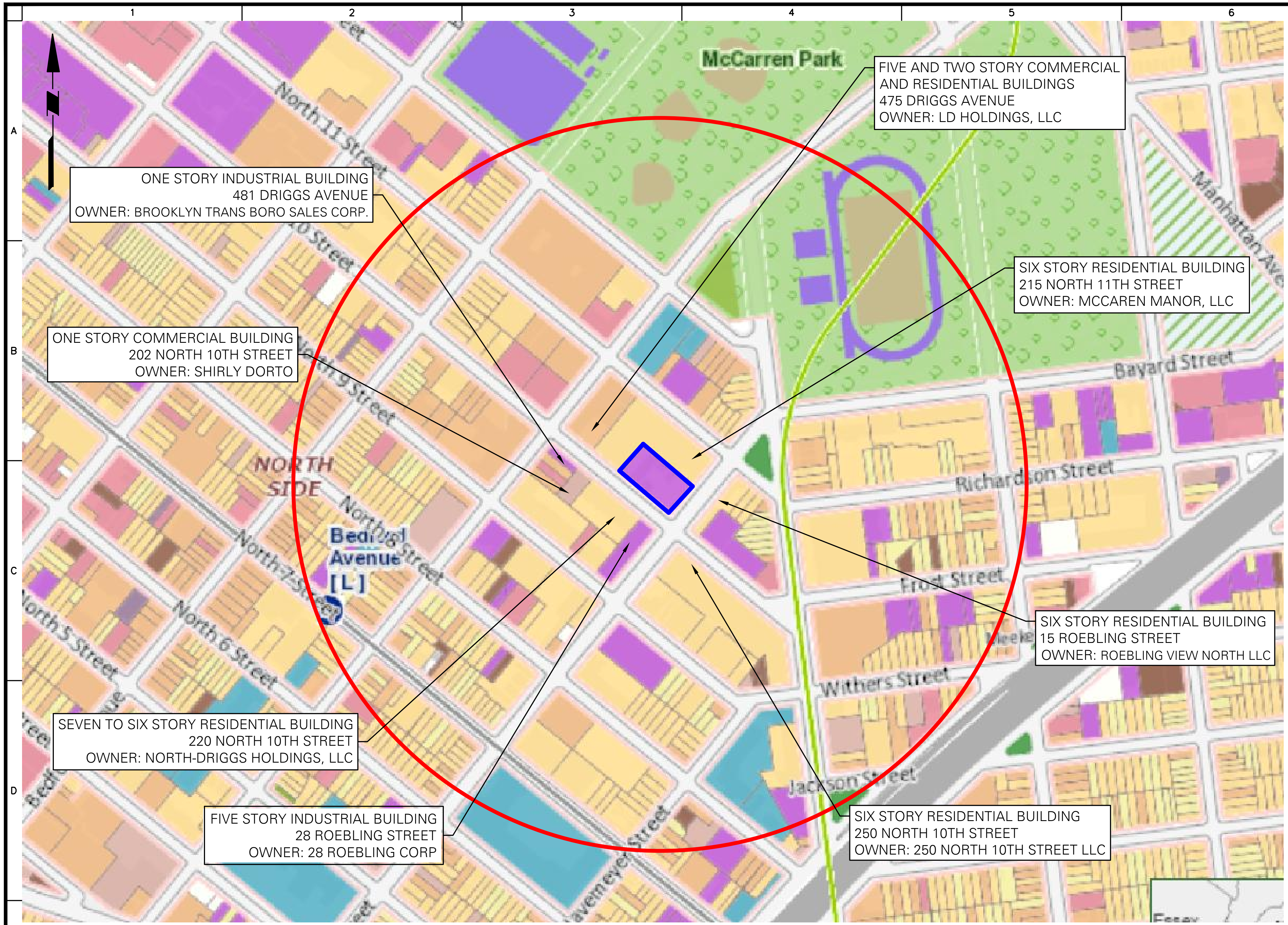
SITE PLAN

Project No.
170482201
Date
12/26/2017
Scale
1"=20'
Drawn By
KN
Checked By
AT
Submission Date
JANUARY 2018

Figure No.
2

Sheet 2 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figure 2 - Site Plan.dwg Date: 12/26/2017 Time: 11:56 User: knagotko Style Table: Langan.stb Layout: ANSIB-BL



FIVE AND TWO STORY COMMERCIAL AND RESIDENTIAL BUILDINGS
475 DRIGGS AVENUE
OWNER: LD HOLDINGS, LLC

ONE STORY INDUSTRIAL BUILDING
481 DRIGGS AVENUE
OWNER: BROOKLYN TRANS BORO SALES CORP.

SIX STORY RESIDENTIAL BUILDING
215 NORTH 11TH STREET
OWNER: MCCAREN MANOR, LLC

ONE STORY COMMERCIAL BUILDING
202 NORTH 10TH STREET
OWNER: SHIRLY DORTO

SIX STORY RESIDENTIAL BUILDING
15 ROEBLING STREET
OWNER: ROEBLING VIEW NORTH LLC

SEVEN TO SIX STORY RESIDENTIAL BUILDING
220 NORTH 10TH STREET
OWNER: NORTH-DRIGGS HOLDINGS, LLC

FIVE STORY INDUSTRIAL BUILDING
28 ROEBLING STREET
OWNER: 28 ROEBLING CORP

SIX STORY RESIDENTIAL BUILDING
250 NORTH 10TH STREET
OWNER: 250 NORTH 10TH STREET LLC

300 0 150 300
SCALE IN FEET

LEGEND:

BCP SITE BOUNDARY
1000-FOOT RADIUS

🟨 1 & 2 FAMILY RESIDENTIAL
🟨 MULTI-FAMILY RESIDENTIAL
🟧 MIXED USE
🟩 OPEN SPACE & OUTDOOR RECREATION
🟥 COMMERCIAL
🟦 INSTITUTIONS
🟪 INDUSTRIAL
🟫 PARKING
🟪 TRANSPORTATION/UTILITIES
🟫 VACANT LOTS

GENERAL NOTES:

1. BACKGROUND MAP TAKEN FROM WWW.OASISNYC.ORG ON SEPTEMBER 20, 2017.
2. BCP = BROWNFIELD CLEANUP PROGRAM

LANGAN

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Collectively known as Langan

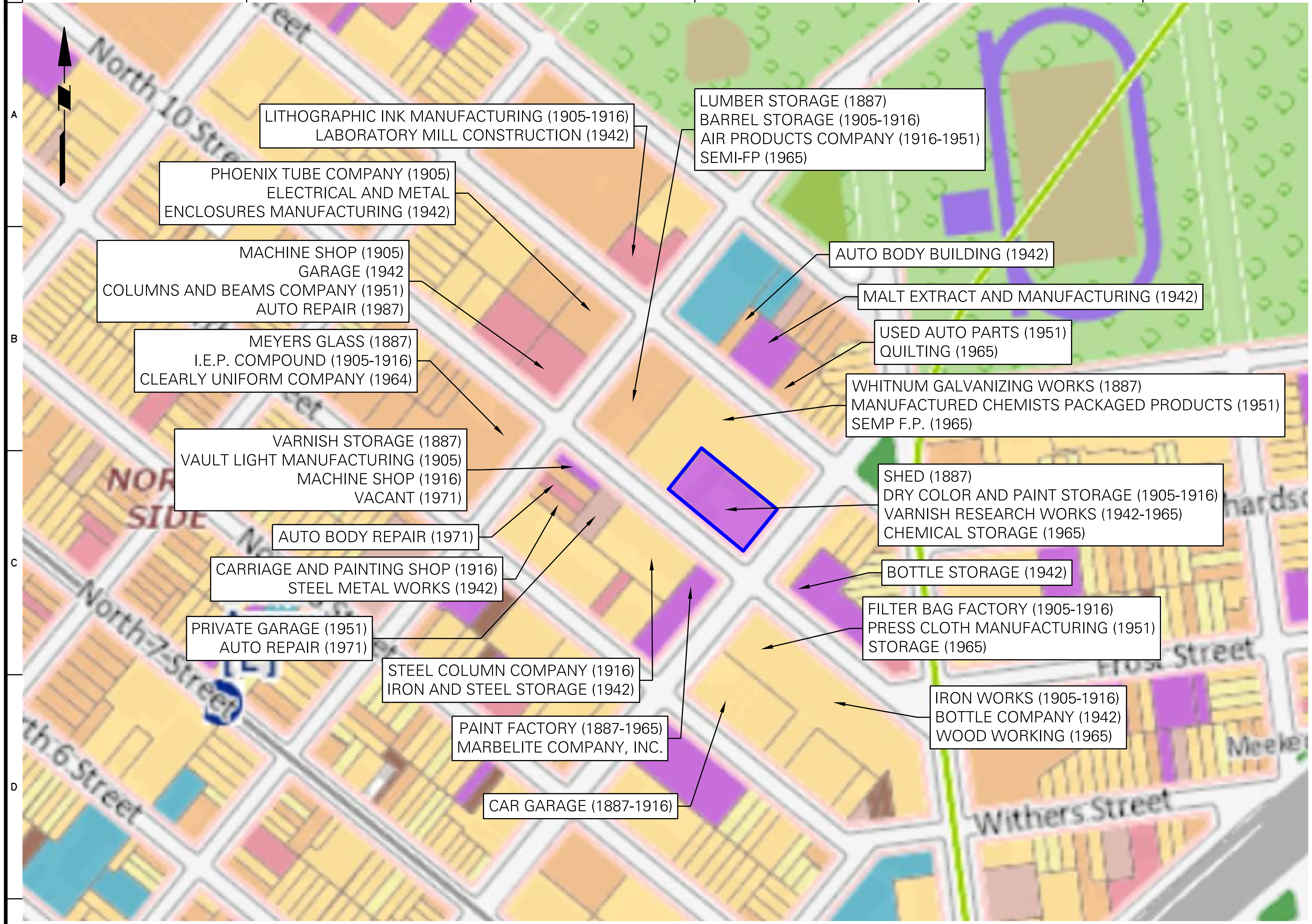
Project
215 NORTH 10TH STREET
BLOCK No. 2299, LOT No. 21
BROOKLYN
KINGS NEW YORK

Figure Title
ADJOINING PROPERTIES AND SURROUNDING LAND USE MAP

Project No. 170482201
Date 10/18/2017
Scale 1" = 300'
Drawn By KN
Checked By AT
Submission Date JANUARY 2018

Figure No. 3
Sheet 3 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figure 3 - Adjoining Properties and Surrounding Land Use Map.dwg Date: 1/22/2018 Time: 17:42 User: knagotko Style Table: Langan.stb Layout: ANSIB-BL



LEGEND:

BCP SITE BOUNDARY

- 🟨 1 & 2 FAMILY RESIDENTIAL
- 🟨 MULTI-FAMILY RESIDENTIAL
- 🟧 MIXED USE
- 🟩 OPEN SPACE & OUTDOOR RECREATION
- 🟥 COMMERCIAL
- 🟦 INSTITUTIONS
- 🟪 INDUSTRIAL
- 🟫 PARKING
- 🟪 TRANSPORTATION/UTILITIES
- 🟫 VACANT LOTS

GENERAL NOTES:

1. BACKGROUND MAP TAKEN FROM WWW.OASISNYC.ORG ON SEPTEMBER 20, 2017.
2. BCP = BROWNFIELD CLEANUP PROGRAM

200 0 100 200
SCALE IN FEET

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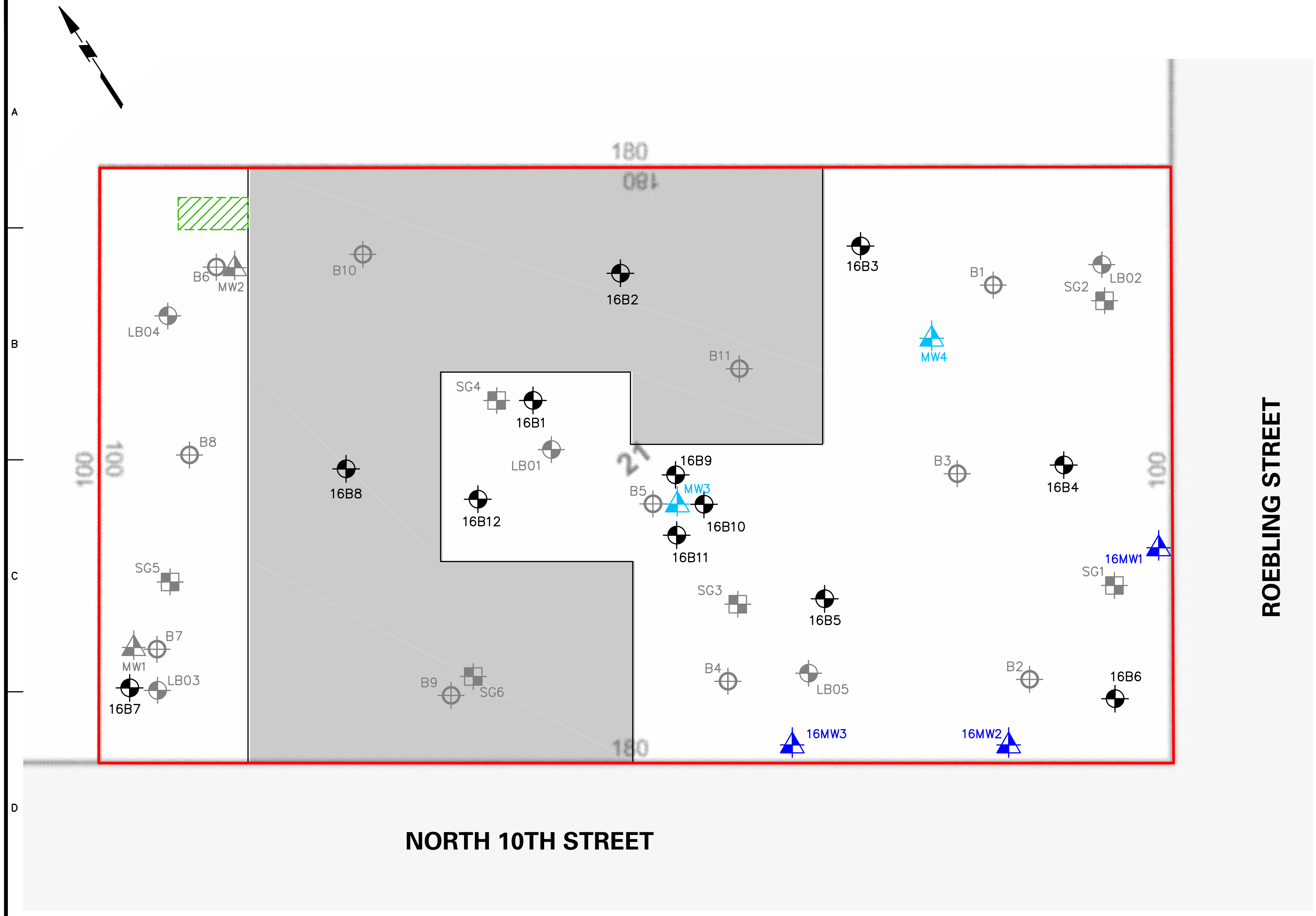
Figure Title

HISTORIC SITE AND SURROUNDING LAND USE MAP

Project No. 170482201	Figure No. 4
Date 10/18/2017	
Scale 1" = 200'	
Drawn By KN	Checked By AT
Submission Date JANUARY 2018	Sheet 4 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figure 4 - Historic Site and Surrounding Land Uses Map.dwg Date: 1/22/2018 Time: 17:48 User: knagotko Style Table: Langan.stb Layout: ANSIB-BL



LEGEND:

🟥 APPROXIMATE BCP SITE BOUNDARY

16B1 ⊕ RI SOIL BORING LOCATION

16MW1 ▲ RI MONITORING WELL LOCATION

MW3 ▲ EXISTING MONITORING WELL LOCATION (EBC JULY 2015)

LB01 ⊕ PRELIMINARY SITE INVESTIGATION BORING LOCATION (LANGAN OCTOBER 2017)

B1 ⊕ PHASE II SOIL BORING LOCATION (EBC JULY 2015)

MW1 ▲ PHASE II MONITORING WELL (EBC JULY 2015)

SG1 ▣ PHASE II SOIL VAPOR SAMPLE LOCATION (EBC JULY 2015)

▨ APPROXIMATE BUILDING BOUNDARIES

🟩 POTENTIAL UNDERGROUND STORAGE TANK

GENERAL NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. REMEDIAL INVESTIGATION BORING/SAMPLE LOCATIONS ARE APPROXIMATE. PREVIOUS SAMPLE LOCATIONS WERE ESTIMATED BY REFERENCING THE FEBRUARY 8, 2017 REMEDIAL INVESTIGATION WORK PLAN, PREPARED BY ENVIRONMENTAL BUSINESS CONSULTANTS (EBC)
3. RI = REMEDIAL INVESTIGATION
4. BCP = BROWNFIELD CLEANUP PROGRAM

20 0 5 10 20
SCALE IN FEET

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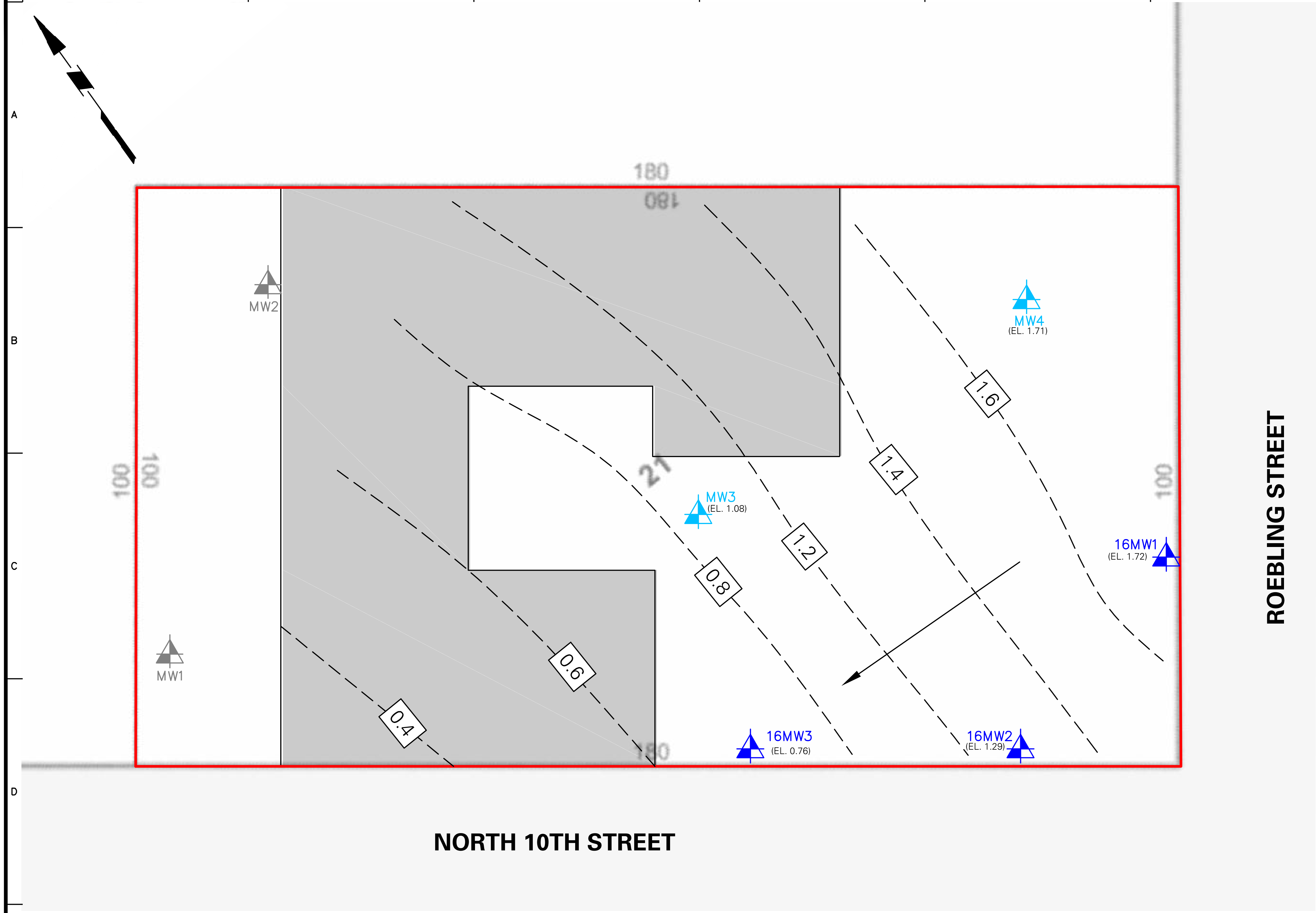
Figure Title
SAMPLE LOCATION MAP

Project No. 170482201
Date 11/30/2017
Scale 1" = 20'
Drawn By KN
Checked By AT
Submission Date JANUARY 2018

Figure No.
5

Sheet 5 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figures 5-8 - Sample Location and Results Map.dwg Date: 1/23/2018 Time: 15:26 User: atashji Style Table: Langan.stb Layout: Fig 5 - Sample Location Map



LEGEND:

🟥 APPROXIMATE SITE BOUNDARY

16MW1 ▲ RI MONITORING WELL LOCATION

MW3 ▲ EXISTING MONITORING WELL LOCATION (EBC JULY 2015)

MW1 ▲ PHASE II MONITORING WELL (EBC JULY 2015)

APPROXIMATE GROUNDWATER ELEVATION CONTOUR (EL. FEET NAVD88)

INFERRED GROUNDWATER FLOW DIRECTION

GENERAL NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. REMEDIAL INVESTIGATION BORING/SAMPLE LOCATIONS ARE APPROXIMATE. EXISTING MONITORING WELL LOCATIONS WERE ESTIMATED BY REFERENCING THE FEBRUARY 8, 2017 REMEDIAL INVESTIGATION WORK PLAN, PREPARED BY ENVIRONMENTAL BUSINESS CONSULTANTS (EBC).
3. GROUNDWATER ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), WHICH IS APPROXIMATELY 1.1 FEET ABOVE MEAN SEA LEVEL DATUM AT SANDY HOOK, NEW JERSEY AS DEFINED BY THE UNITED STATES GEOLOGICAL SURVEY (USGS) NATIONAL GEODECTIC VERTICAL DATUM (NGVD) 1929.
4. MONITORING WELLS WERE SURVEYED BY LANGAN FROM THE TOP OF THE INNER POLYVINYL CHLORIDE (PVC) CASING ON DECEMBER 29, 2017 AND JANUARY 2, 2018.
5. GROUNDWATER ELEVATION DATA FROM MONITORING WELLS MW1 AND MW2 ARE NOT INCLUDED IN THE GROUNDWATER CONTOUR.

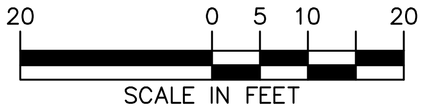


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Figure Title
GROUNDWATER CONTOUR MAP

Project No. 170482201
Date 1/3/2018
Scale 1"=20'
Drawn By KN
Checked By AT
Submission Date JANUARY 2018

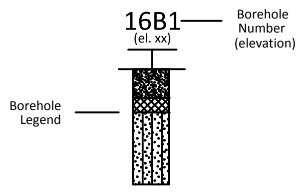
Figure No. 6
Sheet 6 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figure 6 - Groundwater Contour Map.dwg Date: 1/22/2018 Time: 18:23 User: knagotko Style Table: Langan.stb Layout: ANSIB-BL

GENERAL NOTES:

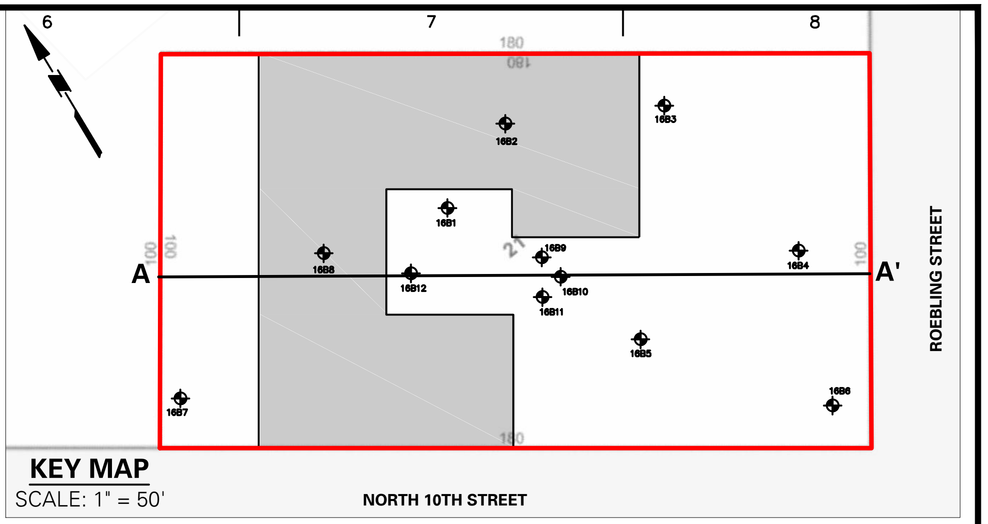
1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. REMEDIAL INVESTIGATION BORING/SAMPLE LOCATIONS ARE APPROXIMATE.
3. THIS PROFILE REPRESENTS A GENERALIZED SOIL CROSS SECTION INTERPRETED FROM WIDELY SPACED BORINGS. SOIL AND GROUNDWATER MAY VARY IN TYPE LOCATION, ELEVATION, AND ENVIRONMENTAL AND ENGINEERING PROPERTIES BETWEEN POINTS OF EXPLORATION. VARIATIONS IN SUBSURFACE CONDITIONS SHOULD BE EXPECTED BETWEEN BORINGS.
4. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
5. ELEVATIONS ESTIMATED BASED ON WELL SURVEY DATA FROM LANGAN DATED ON 12/29/2017 AND 1/2/2018.

EXPLANATION:

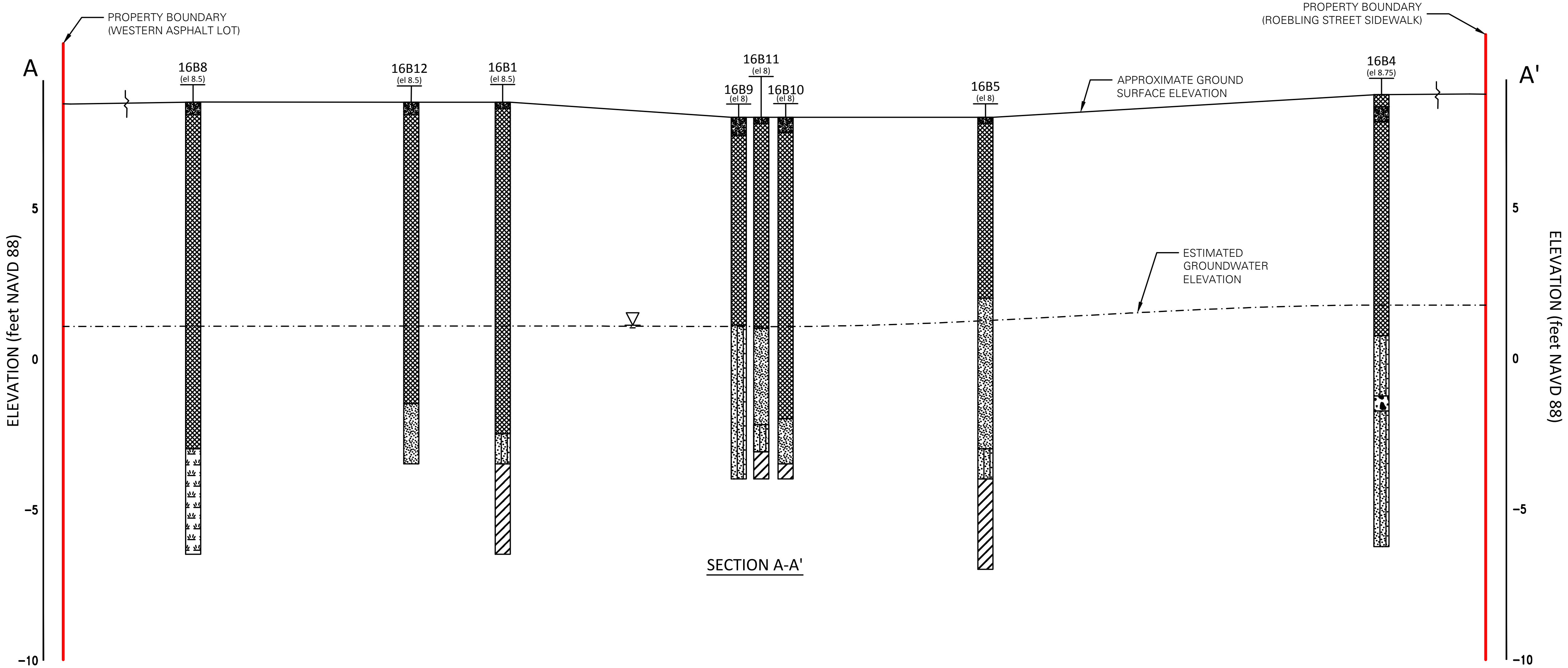


LEGEND:

🟥	APPROXIMATE BCP SITE BOUNDARY
16B1 ⌖	RI SOIL BORING LOCATION
▨	APPROXIMATE BUILDING BOUNDARIES
▽	WATER LEVEL READING
▩	CONCRETE
▦	FILL
▒	SAND
●	GRAVEL
░	SILTY SAND
▤	PEAT/ORGANICS
▧	CLAY



KEY MAP
SCALE: 1" = 50'



SECTION A-A'

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Figure Title
SUBSURFACE PROFILE

Project No. 170482201		Figure No.
Date 1/3/2018		7
Scale AS NOTED		
Drawn By KN	Checked By AT	
Submission Date JANUARY 2018		Sheet 7 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figure 7 - Subsurface Profile_RECOVER.dwg Date: 1/22/2018 Time: 18:26 User: knagotko Style Table: Langan.stb Layout: ANSIB-BL

BORING LOCATION	B6		
SAMPLING DATE	7/23/2015		
SAMPLE DEPTH (feet bgs)	0-2	2-4	8-10
VOCs (mg/kg)			
Acetone	NE	ND	**0.054**
m&p-Xylenes	**0.46**	ND	ND
Trichloroethene	NE	**3.9**	NE
SVOCs (mg/kg)			
Benz(a)anthracene	**1.4**	NE	NE
Benzo(k)fluoranthene	**0.88**	NE	NE
Chrysene	**1.6**	**1.2**	NE
Indeno(1,2,3-cd)pyrene	**0.79**	NE	NE
PCBs (mg/kg)			
Total PCBs	ND	ND	ND
Pesticides (mg/kg)			
Total Pesticides	ND	ND	ND
Metals (mg/kg)			
Arsenic	**19.7**	**29.9**	NE
Chromium	**33.6**	NE	NE
Copper	**684**	**1,170**	**230**
Lead	**4,320**	**330**	**254**
Mercury	**0.49**	**9.47**	**0.49**
Nickel	**56.5**	**41.8**	NE
Zinc	**495**	**624**	NE

BORING LOCATION	B10	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	10-12
VOCs (mg/kg)		
Acetone	NE	**0.08**
Trichloroethene	**3.2**	NE
SVOCs (mg/kg)		
Benz(a)anthracene	**1.4**	NE
Benzo(a)pyrene	**1.3**	NE
Benzo(b)fluoranthene	**1.2**	ND
Benzo(k)fluoranthene	**1.1**	ND
Chrysene	**1.5**	NE
Indeno(1,2,3-cd)pyrene	**0.87**	NE
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	NE	ND
Metals (mg/kg)		
Arsenic	**15**	**61.3**
Barium	NE	**415**
Copper	**309**	**60**
Lead	**173**	**519**
Mercury	NE	**0.39**
Zinc	**312**	**137**

BORING LOCATION	16B1			
SAMPLING DATE	11/20/2017			
SAMPLE DEPTH (FEET BGS)	0 to 2	7 to 8	11 to 12	14 to 15
VOCs (mg/kg)				
1,2,4-Trimethylbenzene	ND	**8.7**	NE	ND
cis-1,2-Dichloroethene	NE	**1.1**	NE	ND
Naphthalene	NE	**13**	NE	ND
Trichloroethene	**30**	NE	NE	ND
Xylenes, Total	ND	**2.6**	NE	ND
SVOCs (mg/kg)				
3-Methylphenol/4-Methylphenol	ND	ND	**0.5**	ND
Benzo(a)anthracene	**1.2**	NE	NE	ND
Benzo(b)fluoranthene	**1.3**	NE	NE	ND
Chrysene	**1.2**	**1.2**	NE	ND
Indeno(1,2,3-cd)pyrene	**0.59**	ND	NE	ND
Total Metals (mg/kg)				
Arsenic, Total	NE	**19.2**	NE	NE
Cadmium, Total	NE	**37.2**	NE	NE
Copper, Total	**118**	**53.7**	NE	NE
Lead, Total	158	**659**	**426**	NE
Mercury, Total	**1.5**	**1.5**	**3.8**	NE
Nickel, Total	NE	**295**	NE	NE
Selenium, Total	NE	**6.7**	NE	NE
Zinc, Total	NE	**1520**	NE	NE

BORING LOCATION	16B2			
SAMPLING DATE	11/20/2017			
SAMPLE DEPTH (FEET BGS)	7 to 8	11 to 12	13 to 14	14 to 15
VOCs (mg/kg)				
Trichloroethene	**5.5**	ND	ND	ND
SVOCs (mg/kg)				
Benzo(a)anthracene	**5.4**	NE	NE	ND
Benzo(a)pyrene	**5.1**	NE	NE	ND
Benzo(b)fluoranthene	**6.5**	NE	NE	ND
Benzo(k)fluoranthene	**2.1**	ND	NE	ND
Chrysene	**5.3**	NE	NE	ND
Dibenzo(a,h)anthracene	**0.69**	ND	NE	ND
Indeno(1,2,3-cd)pyrene	**3.2**	NE	NE	ND
Total Metals (mg/kg)				
Arsenic, Total	**30.8**	**35.9**	**20.6**	NE
Cadmium, Total	**7.99**	NE	**2.66**	NE
Copper, Total	**646**	NE	**64.2**	NE
Lead, Total	**272**	**295**	**666**	NE
Mercury, Total	**1.3**	**3.5**	**2.1**	NE
Nickel, Total	60.9	NE	**44**	NE
Zinc, Total	**7990**	**126**	**304**	NE

BORING LOCATION	16B3		
SAMPLING DATE	11/21/2017		
SAMPLE DEPTH (FEET BGS)	0 to 2	7 to 8	10.5 to 11.5
VOCs (mg/kg)			
1,2,4-Trimethylbenzene	NE	**6.2**	ND
2-Butanone	**0.78** UJ	**1.4** UJ	**0.6** UJ
Acetone	**0.23** J	ND	ND
cis-1,2-Dichloroethene	ND	**16**	ND
trans-1,2-Dichloroethene	ND	**1.1**	ND
Trichloroethene	NE	**9.6**	ND
Vinyl chloride	ND	**1.6**	ND
Xylenes, Total	**7.2**	**2.1** J	ND
SVOCs (mg/kg)			
3-Methylphenol/4-Methylphenol	NE	**0.95**	NE
Benzo(a)anthracene	NE	**3**	NE
Benzo(a)pyrene	NE	**3.3**	NE
Benzo(b)fluoranthene	NE	**4**	NE
Benzo(k)fluoranthene	NE	**1.3**	NE
Chrysene	NE	**3**	NE
Dibenzo(a,h)anthracene	NE	**0.54**	NE
Indeno(1,2,3-cd)pyrene	**0.52**	**2**	NE
Total Metals (mg/kg)			
Arsenic, Total	**20.8**	**86**	ND
Barium, Total	**672**	NE	NE
Cadmium, Total	**9.17**	**18**	NE
Copper, Total	**321**	**1250**	NE
Lead, Total	**1640**	**1340**	NE
Mercury, Total	**1.7**	**160**	**0.62**
Nickel, Total	NE	**60.8**	NE
Zinc, Total	**2020**	**632**	NE

BORING LOCATION	B1	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	10-12
VOCs (mg/kg)		
Acetone	**3.8**	NE
cis-1,2-Dichloroethene	**1.6**	NE
m&p-Xylenes	**1.7**	ND
SVOCs (mg/kg)		
Benz(a)anthracene	**1.3**	ND
Benzo(a)pyrene	**1.7**	ND
Benzo(b)fluoranthene	**2.3**	ND
Benzo(k)fluoranthene	**1.7**	ND
Chrysene	**2.1**	ND
Dibenz(a,h)anthracene	**0.35**	ND
Indeno(1,2,3-cd)pyrene	**1.3**	NE
Phenol	**1.3**	ND
PCBs (mg/kg)		
Aroclor 1260	**0.87**	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	**91.8**	NE
Barium	**4,280**	NE
Cadmium	**19.8**	NE
Chromium	**396**	NE
Copper	**1,070**	NE
Lead	**4,960**	**146**
Mercury	**1.71**	**0.58**
Nickel	**3,110**	NE
Silver	**5.48**	NE
Zinc	**7,580**	NE

BORING LOCATION	LB04	
SAMPLING DATE	10/20/2017	
SAMPLE DEPTH (feet bgs)	10-11	14-15
VOCs (mg/kg)		
Acetone	**0.18**	NE
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.1**	ND
Benzo(a)pyrene	**3**	ND
Benzo(b)fluoranthene	**3.7**	ND
Benzo(k)fluoranthene	**1**	ND
Chrysene	**2.9**	ND
Dibenzo(a,h)anthracene	**0.38**	ND
Indeno(1,2,3-cd)pyrene	**1.8**	ND
Herbicides (mg/kg)		
Total Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Total Metals (mg/kg)		
Lead, Total	**81.3**	7.68
Mercury, Total	**0.93**	ND

BORING LOCATION	LB01	
SAMPLING DATE	10/20/2017	
SAMPLE DEPTH (feet bgs)	9-11	11-12
VOCs (mg/kg)		
Acetone	**0.14**	**0.084**
SVOCs (mg/kg)		
3-Methylphenol/4-Methylphenol	NE	**2**
Herbicides (mg/kg)		
Total Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	NE	NE
Total Metals (mg/kg)		
Arsenic, Total	**21.2**	NE
Copper, Total	**50.9**	NE
Lead, Total	**70.6**	**250**
Mercury, Total	**0.32**	**1.4**
Nickel, Total	**163**	NE
Zinc, Total	**477**	NE

BORING LOCATION	16B9
SAMPLING DATE	11/20/2017
SAMPLE DEPTH (FEET BGS)	10 to 11
VOCs (mg/kg)	
Total VOCs	NE
SVOCs (mg/kg)	
Total SVOCs	NE
Herbicides (mg/kg)	
Total Herbicides	ND
PCBs (mg/kg)	
Total PCBs	ND
Pesticides (mg/kg)	
Total Pesticides	ND
Total Metals (mg/kg)	
Arsenic, Total	**117**
Chromium, Hexavalent	**1.2** UJ
Lead, Total	**9410**
Mercury, Total	**3.4**
Zinc, Total	**391**

BORING LOCATION	LB02	
SAMPLING DATE	10/20/2017	
SAMPLE DEPTH (feet bgs)	10-12	13-14
VOCs (mg/kg)		
Acetone	ND	**0.22**
Methylene chloride	**0.16**	ND
SVOCs (mg/kg)		
Benzo(a)anthracene	**3.2**	ND
Benzo(a)pyrene	**2.9**	ND
Benzo(b)fluoranthene	**3.4**	ND
Benzo(k)fluoranthene	**1**	ND
Chrysene	**3**	ND
Dibenzo(a,h)anthracene	**0.38**	ND
Indeno(1,2,3-cd)pyrene	**1.5**	ND
Herbicides (mg/kg)		
Total Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	NE	ND
Pesticides (mg/kg)		
4,4'-DDE	NE	**0.00709**
4,4'-DDT	**0.00934**	ND
Dieldrin	**0.00568**	ND
Total Metals (mg/kg)		
Total Metals	NE	NE

BORING LOCATION	B11	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	6-8
VOCs (mg/kg)		
cis-1,2-Dichloroethene	NE	**1.5**
m&p-Xylenes	NE	**1.1**
Tetrachloroethene	**9.4**	ND
Trichloroethene	**0.57**	**0.94**
SVOCs (mg/kg)		
Benz(a)anthracene	**3.9**	NE
Benzo(a)pyrene	**3.9**	NE
Benzo(b)fluoranthene	**3.7**	NE
Benzo(k)fluoranthene	**3.6**	NE
Dibenz(a,h)anthracene	**4.7**	**1.1**
Chrysene	**0.52**	ND
Indeno(1,2,3-cd)pyrene	**2.3**	**0.64**
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	**50.3**	**48.3**
Cadmium	**8.32**	**2.65**
Copper	**245**	**315**
Lead	**368**	**752**
Mercury	**1.07**	**6.24**
Nickel	**34.6**	**188**
Zinc	**3,060**	**1300**

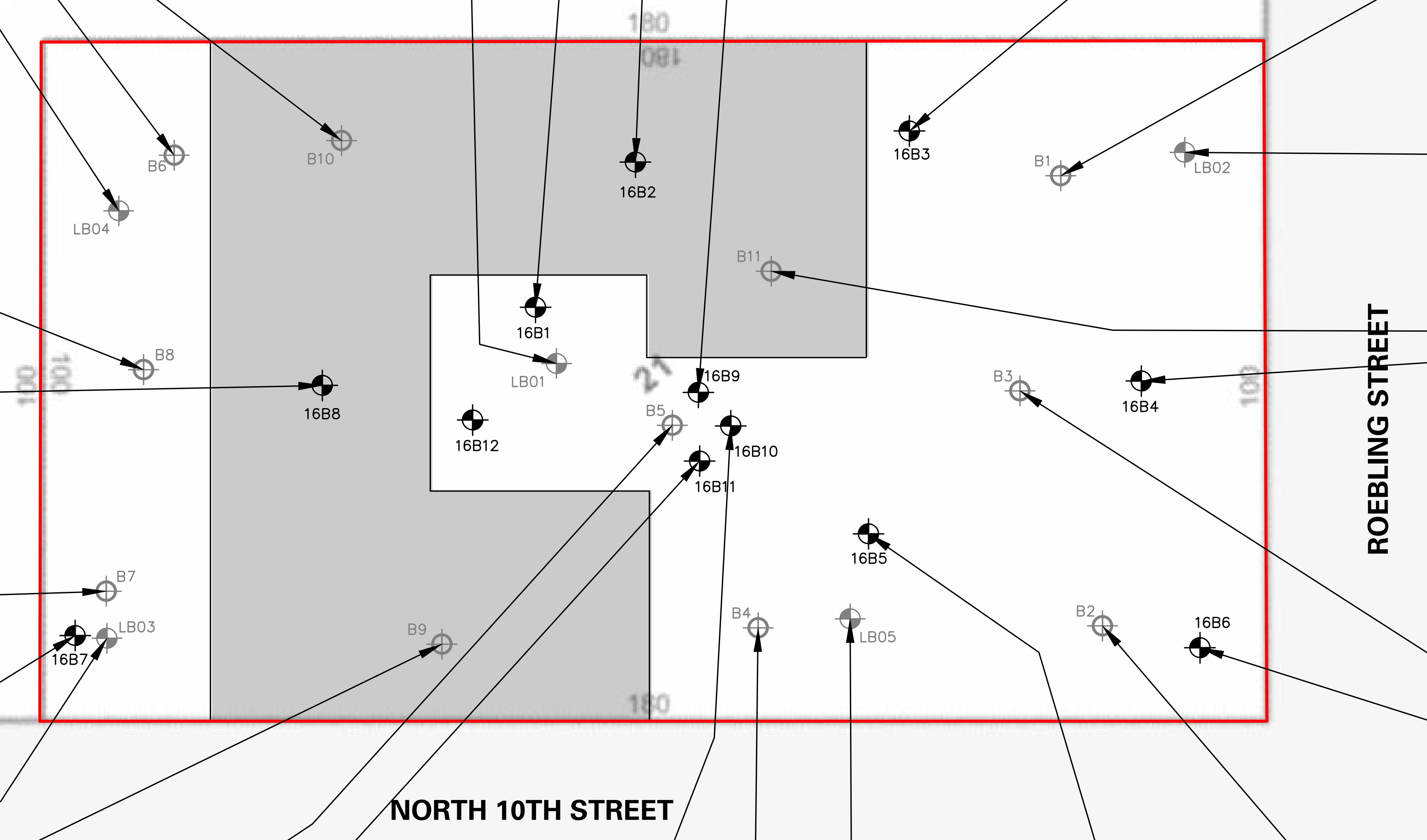
BORING LOCATION	16B8			
SAMPLING DATE	11/20/2017			
SAMPLE DEPTH (FEET BGS)	0 to 2	5.5 to 6.5	11 to 12	14 to 15
VOCs (mg/kg)				
2-Butanone	NE	**1.4** UJ	NE	NE
cis-1,2-Dichloroethene	**0.78**	**0.39**	**0.26**	ND
Tetrachloroethene	2.3	NE	NE	ND
Trichloroethene	**29**	**15**	**15**	NE
Xylenes, Total	**0.49** J	ND	NE	ND
SVOCs (mg/kg)				
3-Methylphenol/4-Methylphenol	ND	NE	**0.38**	NE
Benzo(a)anthracene	NE	**1.4**	NE	**2**
Benzo(a)pyrene	NE	**1.3**	NE	**2.1**
Benzo(b)fluoranthene	NE	**1.6**	**1.1**	**2.6**
Chrysene	NE	**1.3**	NE	**1.9**
Dibenzo(a,h)anthracene	NE	NE	NE	**0.35**
Indeno(1,2,3-cd)pyrene	NE	**0.77**	**0.61**	**1.4**
Total Metals (mg/kg)				
Arsenic, Total	NE	**28.9**	**24.4**	NE
Cadmium, Total	NE	**7.86**	NE	NE
Chromium, Trivalent	NE	**95**	**67**	**34**
Copper, Total	NE	**1030**	**216**	**93.9**
Lead, Total	NE	**487**	**193**	**300**
Mercury, Total	**68**	**2.6**	**43**	**3.7**
Nickel, Total	NE	**161**	NE	NE
Selenium, Total	NE	**4.21**	NE	NE
Silver, Total	ND	**20.7**	**3.69**	NE
Zinc, Total	NE	**949**	**203**	**214**

BORING LOCATION	B8	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	10-12
VOCs (mg/kg)		
Trichloroethene	**0.57**	NE
SVOCs (mg/kg)		
3&4-Methylphenol	ND	**0.53**
PCBs (mg/kg)		
Total PCBs	NE	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	**14.4**	NE
Chromium	**42**	NE
Copper	**397**	NE
Lead	**65**	**125**
Mercury	**0.13**	**2.63**
Nickel	**38.7**	NE
Zinc	**140**	**111**

BORING LOCATION	16B4			
SAMPLING DATE	11/21/2017			
SAMPLE DEPTH (FEET BGS)	3 to 4	DUP02 3 to 4	11 to 12	14.5 to 15
VOCs (mg/kg)				
Acetone	NE	ND	**0.051**	NE
cis-1,2-Dichloroethene	NE	**0.63**	ND	NE
Trichloroethene	NE	**4.6**	ND	NE
SVOCs (mg/kg)				
Benzo(a)anthracene	NE	**1.2**	ND	ND
Benzo(a)pyrene	NE	**1.1**	ND	ND
Benzo(b)fluoranthene	NE	**1.5**	ND	ND
Chrysene	NE	**1.2**	ND	ND
Indeno(1,2,3-cd)pyrene	NE	**0.76**	ND	ND
Total Metals (mg/kg)				
Arsenic, Total	NE	**19.8**	NE	**27.7**
Barium, Total	NE	**370**	NE	NE
Copper, Total	**51.7**	NE	NE	**74.5**
Lead, Total	**1010**	**5630**	**96.2**	**417**
Mercury, Total	**1.9**	**4.9**	NE	**2.1**
Zinc, Total	**1320**	**2240**	NE	**1130**

BORING LOCATION	B7	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	2-4
VOCs (mg/kg)		
Total VOCs	NE	NE
SVOCs (mg/kg)		
Total SVOCs	NE	NE
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	**210**	**45.4**
Cadmium	**3**	**3.36**
Chromium	**1,280**	**1,680**
Copper	**145**	**123**
Lead	**411**	**77.7**
Mercury	**0.69**	**0.22**
Nickel	**87**	**40.5**
Zinc	**351**	**144**

BORING LOCATION	16B7	
SAMPLING DATE	11/20/2017	
SAMPLE DEPTH (FEET BGS)	6.5 to 7.5	11 to 12
VOCs (mg/kg)		
Total VOCs	NE	NE
SVOCs (mg/kg)		
Indeno(1,2,3-cd)pyrene	**0.55**	ND
Total Metals (mg/kg)		
Arsenic, Total	NE	**23.1**
Chromium, Trivalent	**2400**	**69**
Copper, Total	**162**	NE
Lead, Total	**348**	**140**
Mercury, Total	**1.1**	**0.58**
Zinc, Total	**323**	NE



BORING LOCATION	B3	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	10-12
VOCs (mg/kg)		
1,1-Dichloroethane	**0.9**	ND
1,1-Dichloroethene	**5.3**	ND
Benzene	ND	**0.42**
cis-1,2-Dichloroethene	**36**	NE
m&p-Xylenes	ND	**1.6**
Naphthalene	NE	**100**
o-Xylene	ND	**0.66**
Toluene	NE	**0.86**
trans-1,2-Dichloroethene	**4.4**	ND
Trichloroethene	**220**	**0.53**
Vinyl Chloride	**0.46**	ND
SVOCs (mg/kg)		
Benz(a)anthracene	NE	**1.8**
Benzo(a)pyrene	NE	**1.6**
Benzo(b)fluoranthene	NE	**1.4**
Benzo(k)fluoranthene	NE	**1.5**
Chrysene	NE	**2.3**
Indeno(1,2,3-cd)pyrene	NE	**0.79**
PCBs (mg/kg)		
Total PCBs	NE	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	NE	**234**
Barium	**2,250**	**1,480**
Chromium	**52**	**37.9**
Copper	**395**	**72.1**
Lead	**1,310**	**8,530**
Mercury	**0.52**	**20.2**
Zinc	**275**	**878**

BORING LOCATION	16B6		
SAMPLING DATE	11/21/2017		
SAMPLE DEPTH (FEET BGS)	3 to 4	10 to 11	14.5 to 15
VOCs (mg/kg)			
Acetone	ND	NE	**0.1**
Trichloroethene	**3.1**	ND	ND
SVOCs (mg/kg)			
Benzo(b)fluoranthene	**1.1**	NE	NE
Indeno(1,2,3-cd)pyrene	**0.57**	NE	NE
Total Metals (mg/kg)			
Arsenic, Total	**32.1**	**95.4**	NE
Cadmium, Total	**3.3**	NE	NE
Chromium, Trivalent	**74**	NE	NE
Copper, Total	**342**	**499**	**71**
Lead, Total	**698**	**671**	**238**
Mercury, Total	**2.5**	**6.8**	**0.58**
Nickel, Total	**32**	**47**	NE
Zinc, Total	**427**	**354**	**118**

BORING LOCATION	16B10
SAMPLING DATE	11/20/2017
SAMPLE DEPTH (FEET BGS)	7 to 8
VOCs (mg/kg)	
Acetone	**0.2** J
cis-1,2-Dichloroethene	**8.7**
Trichloroethene	**0.51**
Vinyl chloride	**0.59**
SVOCs (mg/kg)	
3-Methylphenol/4-Methylphenol	**2.7**
Phenol	**0.44**
Herbicides (mg/kg)	
Total Herbicides	ND
PCBs (mg/kg)	
Total PCBs	ND
Pesticides (mg/kg)	
4,4'-DDT	**0.00469**
Total Metals (mg/kg)	
Arsenic, Total	**91.2**
Lead, Total	**509**
Mercury, Total	**2.7**
Zinc, Total	**537**

BORING LOCATION	LB03	
SAMPLING DATE	10/20/2017	
SAMPLE DEPTH (feet bgs)	7-8	14-15
VOCs (mg/kg)		
Acetone	**0.067**	0.024
SVOCs (mg/kg)		
Total SVOCs	NE	ND
Herbicides (mg/kg)		
Total Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	NE	ND
Total Metals (mg/kg)		
Chromium, Trivalent	**6500**	NE
Copper, Total	**51.8**	NE
Lead, Total	**138**	NE
Mercury, Total	**0.86**	ND
Zinc, Total	**428**	NE

BORING LOCATION	B5	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	10-12
VOCs (mg/kg)		
Acetone	ND	**0.076**
cis-1,2-Dichloroethene	NE	**0.8**
Vinyl Chloride	ND	**0.05**
SVOCs (mg/kg)		
Total SVOCs	ND	NE
PCBs (mg/kg)		
Total PCBs	NE	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	NE	**59.4**
Cadmium	**12**	NE
Chromium	**41.3**	NE
Copper	**154**	**119**
Lead	**541**	**223**
Mercury	**0.54**	**1.12**
Nickel	**200**	NE
Zinc	**627**	**342**

BORING LOCATION	LB05	
SAMPLING DATE	10/20/2017	
SAMPLE DEPTH (feet bgs)	7-8	14-15
VOCs (mg/kg)		
1,1-Dichloroethane	**0.36**	ND
Benzene	**0.78**	ND
cis-1,2-Dichloroethene	**9.7**	ND
trans-1,2-Dichloroethene	**0.31**	ND
Trichloroethene	**7.1**	ND
SVOCs (mg/kg)		
3-Methylphenol/4-Methylphenol	**0.6**	ND
Benzo(a)anthracene	**2.5**	ND
Benzo(a)pyrene	**2.2**	ND
Benzo(b)fluoranthene	**2.1**	ND
Chrysene	**2.3**	ND
Dibenzo(a,h)anthracene	**0.48**	ND
Indeno(1,2,3-cd)pyrene	**1**	ND
Herbicides (mg/kg)		
Total Herbicides	ND	ND
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	NE	ND
Total Metals (mg/kg)		
Arsenic, Total	**55**	NE
Cadmium, Total	**6.39**	NE
Copper, Total	**150**	NE
Lead, Total	**537**	NE
Mercury, Total	**0.67**	NE
Nickel, Total	**59.4**	NE
Selenium, Total	**4.3**	ND
Zinc, Total	**1320**	NE

BORING LOCATION	16B5			
SAMPLING DATE	11/20/2017			
SAMPLE DEPTH (FEET BGS)	4.5 to 5	12 to 13	DUP 12 to 13	14 to 15
VOCs (mg/kg)				
cis-1,2-Dichloroethene	**1.3**	NE	ND	ND
Tetrachloroethene	**5.7**	NE	ND	ND
Trichloroethene	**13**	NE	NE	ND
SVOCs (mg/kg)				
Benzo(a)anthracene	**1.4**	ND	ND	ND
Benzo(a)pyrene	**1.2**	ND	ND	ND
Benzo(b)fluoranthene	**1.5**	ND	ND	ND
Chrysene	**1.3**	ND	ND	ND
Indeno(1,2,3-cd)pyrene	**0.69**	ND	ND	ND
Total Metals (mg/kg)				
Arsenic, Total	**31.9**	NE	NE	NE
Chromium, Hexavalent	ND	ND	**1.5** UJ	ND
Chromium, Trivalent	**74**	NE	NE	NE
Copper, Total	**298**	NE	NE	NE
Lead, Total	**1630**	NE	NE	NE
Mercury, Total	**28**	**0.45**	**0.65**	NE
Nickel, Total	**39.6**	NE	**35.5**	NE
Silver, Total	**57.8**	ND	ND	ND
Zinc, Total	**648**	NE	**133**	NE

BORING LOCATION	B2		
SAMPLING DATE	7/23/2015		
SAMPLE DEPTH (FEET BGS)	0-2	3-5	10-12
VOCs (mg/kg)			
1,2,4-Trimethylbenzene	NE	**7.1**	ND
1,3,5-Trimethylbenzene	NE	**35**	ND
Acetone	ND	ND	**0.08**
cis-1,2-Dichloroethene	**14**	**5.9**	NE
Ethylbenzene	NE	**10**	ND
m&p-Xylenes	**0.54**	**1.8**	ND
Methylene chloride	**0.82**	ND	ND
n-Propylbenzene	ND	**7.6**	ND
sec-Butylbenzene	ND	**13**	ND
Tetrachloroethene	**4.3**	**2**	ND
trans-1,2-Dichloroethene	**0.46**	ND	ND
Trichloroethene	**32**	**57**	NE
SVOCs (mg/kg)			
Total SVOCs	NE	NE	NE
PCBs (mg/kg)			
Total PCBs	NE	ND	NE
Pesticides (mg/kg)			
Total Pesticides	ND	ND	ND
Metals (mg/kg)			
Arsenic	**40.2**	**16.7**	NE
Barium	**888**	NE	NE
Cadmium	**3.34**	NE	ND
Chromium	**66.7**	NE	**39.6**
Copper	**155**	NE	NE
Lead	**881**	**820**	**66.8**
Mercury	**28.8**	**8.22**	**0.23**
Nickel	NE	**112**	NE
Zinc	**2510**	**2190**	NE

BORING LOCATION	B9	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	2-4
VOCs (mg/kg)		
Benzene	**1.2**	**0.280**
SVOCs (mg/kg)		
Benz(a)anthracene	**1.5**	**1.4**
Benzo(a)pyrene	**1.5**	**1.3**
Benzo(b)fluoranthene	**1.5**	**1.2**
Benzo(k)fluoranthene	**1.3**	**1.2**
Chrysene	**1.7**	**1.6**
Indeno(1,2,3-cd)pyrene	**1.1**	**0.93**
PCBs (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Total Pesticides	ND	NE
Metals (mg/kg)		
Arsenic	**152**	NE
Chromium	**133**	**81.6**
Copper	**111**	NE
Lead	**301**	**197**
Mercury	**26**	**5.03**
Nickel	**43.4**	NE
Zinc	**298**	**165**

BORING LOCATION	16B11
SAMPLING DATE	11/20/2017
SAMPLE DEPTH (FEET BGS)	7 to 8
VOCs (mg/kg)	
Total VOCs	NE
SVOCs (mg/kg)	
Total SVOCs	NE
Herbicides (mg/kg)	
Total Herbicides	ND
PCBs (mg/kg)	
Total PCBs	ND
Pesticides (mg/kg)	
Total Pesticides	ND
Total Metals (mg/kg)	
Arsenic, Total	**33.9**
Copper, Total	**439**
Lead, Total	**828**
Mercury, Total	**9.6**
Nickel, Total	**30.6**
Zinc, Total	**552**

BORING LOCATION	B4	
SAMPLING DATE	7/23/2015	
SAMPLE DEPTH (feet bgs)	0-2	10-12
VOCs (mg/kg)		
Acetone	ND	**0.15**
Benzene	**5.7**	ND
Toluene	**1.1**	NE
Trichloroethene	**1.6**	NE
SVOCs (mg/kg)		
Benz(a)anthracene	**5.6**	ND
Benzo(a)pyrene	**5**	ND
Benzo(b)fluoranthene	**4.9**	ND
Benzo(k)fluoranthene	**4.1**	ND
Chrysene	**6.2**	ND
Dibenz(a,h)anthracene	**0.72**	ND
Indeno(1,2,3-cd)pyrene	**3.5**	ND
PCBs (mg/kg)		
Total PCBs	NE	ND
Pesticides (mg/kg)		
Total Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	**54.4**	NE
Barium	**5,080**	NE
Cadmium	**6.14**	NE
Chromium	**42.9**	**35.3**
Copper	**110**	NE
Lead	**1,820**	**106**
Mercury	**5.03**	NE
Nickel	**41.9**	NE
Zinc	**18,100**	**122**

LEGEND:

🟥	APPROXIMATE BCP SITE BOUNDARY
16B1 ⊕	RI SOIL BORING LOCATION
LB01 ⊕	PRELIMINARY SITE INVESTIGATION BORING LOCATION (LANGAN OCTOBER 2017)
B1 ⊕	PHASE II SOIL BORING LOCATION (EBC JULY 2015)
▨	APPROXIMATE BUILDING BOUNDARIES

GENERAL NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. REMEDIAL INVESTIGATION BORING/SAMPLE LOCATIONS ARE APPROXIMATE. PREVIOUS SAMPLE LOCATIONS WERE ESTIMATED BY REFERENCING THE FEBRUARY 8, 2017 REMEDIAL INVESTIGATION WORK PLAN, PREPARED BY ENVIRONMENTAL BUSINESS CONSULTANTS (EBC)
3. SOIL SAMPLE RESULTS ARE COMPARED TO TITLE 6 OF THE NEW YORK CODES, RULES, AND REGULATIONS (6 NYCRR) PART 375 UNRESTRICTED USE (UU) AND RESTRICTED USE RESTRICTED-RESIDENTIAL (RURR) SOIL CLEANUP OBJECTIVES (SCOs).
4. ONLY RESULTS ABOVE UU SCOs ARE SHOWN.
5. RESULTS EXCEEDING UU SCOs ARE BOLD.
6. RESULTS EXCEEDING RURR SCOs ARE BOLDED AND SHADED.
7. SODUP01 IS A DUPLICATE OF THE PARENT SAMPLE 16B5_12-13
8. SODUP02 IS A DUPLICATE OF THE PARENT SAMPLE 16B4_3-4
9. SOIL BORING 16B12 WAS ADVANCED TO EXPLORE THE EXTENT OF PETROLEUM IMPACTS. NO SAMPLES WERE COLLECTED FROM THIS BORING.
10. BCP = BROWNFIELD CLEANUP PROGRAM
11. VOCs = VOLATILE ORGANIC COMPOUNDS
12. SVOCs = SEMIVOLATILE ORGANICS COMPOUNDS
13. PCBs = POLYCHLORINATED BIPHENYLS
14. ND = NOT DETECTED
15. NE = NO EXCEEDANCE
16. bgs = BELOW GRADE SURFACE
17. mg/kg = MILLIGRAM PER KILOGRAM
18. J = ANALYTE DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT BUT BELOW THE REPORTING LIMIT
19. UJ = VALIDATOR QUALIFIER - THE ANALYTE WAS NOT DETECTED AT A LEVEL GREATER THAN OR EQUAL TO THE REPORTING LIMIT (RL); HOWEVER, THE REPORTED RL IS APPROXIMATE AND MAY BE INACCURATE OR IMPRECISE.

LANGAN

SUBMISSION DATE: ####

PROJECT NO. 170482201

40 0 10 25 40
SCALE IN FEET

Date	Description	No.
REVISIONS		

SIGNATURE DATE SIGNED
PROFESSIONAL XXXXXXXXXX
STATE LIC. No. XXXXX

LANGAN
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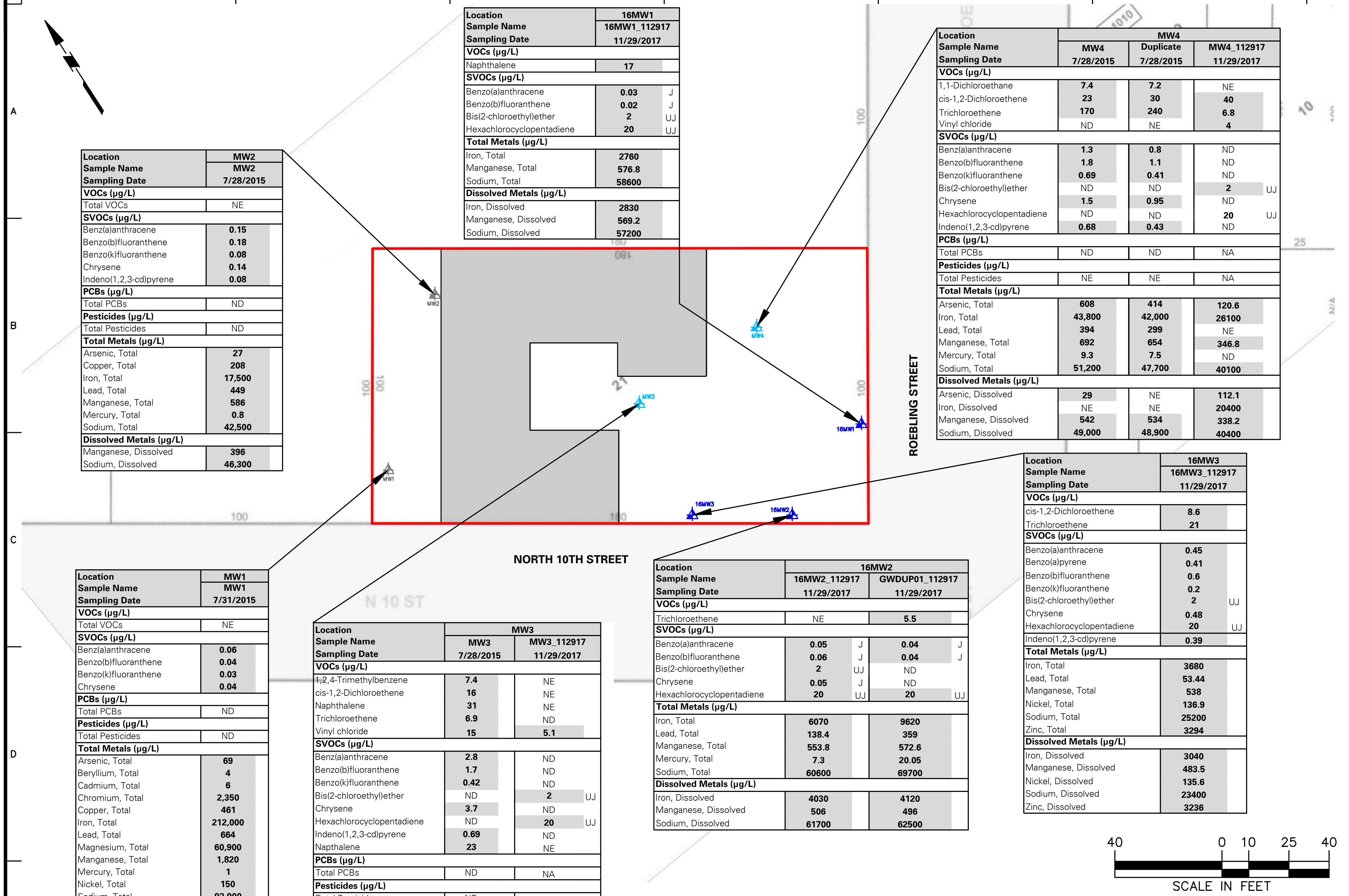
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
215 NORTH 10TH STREET
BLOCK No. 2299, LOT No. 21
BROOKLYN
KINGS NEW YORK

Figure Title
SOIL SAMPLE LOCATIONS AND RESULTS MAP

Project No. 170482201
Date 12/5/2017
Scale 1" = 40'
Drawn By KN
Checked By AT
Submission Date JANUARY 2018
Figure No. 8
Sheet 8 of 10

Filename: \\Langan.com\data\NYC\data2\170482201\Cadd Data - 170482201\SheetFiles\Environmental\BCP-RIR\Figure 8 - Sample Location and Results Map.dwg Date: 4/24/2018 Time: 15:16 User: atashji Style Table: Langan.stb Layout: Fig 8 - Soil Tag Map



Location	MW2
Sample Name	MW2
Sampling Date	7/28/2015
VOCs (µg/L)	
Total VOCs	NE
SVOCs (µg/L)	
Benz(a)anthracene	**0.15**
Benzo(b)fluoranthene	**0.18**
Benzo(k)fluoranthene	**0.08**
Chrysene	**0.14**
Indeno(1,2,3-cd)pyrene	**0.08**
PCBs (µg/L)	
Total PCBs	ND
Pesticides (µg/L)	
Total Pesticides	ND
Total Metals (µg/L)	
Arsenic, Total	**27**
Copper, Total	**208**
Iron, Total	**17,500**
Lead, Total	**449**
Manganese, Total	**586**
Mercury, Total	**0.8**
Sodium, Total	**42,500**
Dissolved Metals (µg/L)	
Manganese, Dissolved	**396**
Sodium, Dissolved	**46,300**

Location	16MW1	
Sample Name	16MW1_112917	
Sampling Date	11/29/2017	
VOCs (µg/L)		
Naphthalene	**17**	
SVOCs (µg/L)		
Benzo(a)anthracene	**0.03**	J
Benzo(b)fluoranthene	**0.02**	J
Bis(2-chloroethyl)ether	**2**	UJ
Hexachlorocyclopentadiene	**20**	UJ
Total Metals (µg/L)		
Iron, Total	**2760**	
Manganese, Total	**576.8**	
Sodium, Total	**58600**	
Dissolved Metals (µg/L)		
Iron, Dissolved	**2830**	
Manganese, Dissolved	**569.2**	
Sodium, Dissolved	**57200**	

Location	MW4			
Sample Name	MW4	Duplicate	MW4_112917	
Sampling Date	7/28/2015	7/28/2015	11/29/2017	
VOCs (µg/L)				
1,1-Dichloroethane	**7.4**	**7.2**	NE	
cis-1,2-Dichloroethene	**23**	**30**	**40**	
Trichloroethene	**170**	**240**	**6.8**	
Vinyl chloride	ND	NE	**4**	
SVOCs (µg/L)				
Benz(a)anthracene	**1.3**	**0.8**	ND	
Benzo(b)fluoranthene	**1.8**	**1.1**	ND	
Benzo(k)fluoranthene	**0.69**	**0.41**	ND	
Bis(2-chloroethyl)ether	ND	ND	**2**	UJ
Chrysene	**1.5**	**0.95**	ND	
Hexachlorocyclopentadiene	ND	ND	**20**	UJ
Indeno(1,2,3-cd)pyrene	**0.68**	**0.43**	ND	
PCBs (µg/L)				
Total PCBs	ND	ND	NA	
Pesticides (µg/L)				
Total Pesticides	NE	NE	NA	
Total Metals (µg/L)				
Arsenic, Total	**608**	**414**	**120.6**	
Iron, Total	**43,800**	**42,000**	**26100**	
Lead, Total	**394**	**299**	NE	
Manganese, Total	**692**	**654**	**346.8**	
Mercury, Total	**9.3**	**7.5**	ND	
Sodium, Total	**51,200**	**47,700**	**40100**	
Dissolved Metals (µg/L)				
Arsenic, Dissolved	**29**	NE	**112.1**	
Iron, Dissolved	NE	NE	**20400**	
Manganese, Dissolved	**542**	**534**	**338.2**	
Sodium, Dissolved	**49,000**	**48,900**	**40400**	

Location	16MW3	
Sample Name	16MW3_112917	
Sampling Date	11/29/2017	
VOCs (µg/L)		
cis-1,2-Dichloroethene	**8.6**	
Trichloroethene	**21**	
SVOCs (µg/L)		
Benzo(a)anthracene	**0.45**	
Benzo(a)pyrene	**0.41**	
Benzo(b)fluoranthene	**0.6**	
Benzo(k)fluoranthene	**0.2**	
Bis(2-chloroethyl)ether	**2**	UJ
Chrysene	**0.48**	
Hexachlorocyclopentadiene	**20**	UJ
Indeno(1,2,3-cd)pyrene	**0.39**	
Total Metals (µg/L)		
Iron, Total	**3680**	
Lead, Total	**53.44**	
Manganese, Total	**538**	
Nickel, Total	**136.9**	
Sodium, Total	**25200**	
Zinc, Total	**3294**	
Dissolved Metals (µg/L)		
Iron, Dissolved	**3040**	
Manganese, Dissolved	**483.5**	
Nickel, Dissolved	**135.6**	
Sodium, Dissolved	**23400**	
Zinc, Dissolved	**3236**	

Location	MW1
Sample Name	MW1
Sampling Date	7/31/2015
VOCs (µg/L)	
Total VOCs	NE
SVOCs (µg/L)	
Benz(a)anthracene	**0.06**
Benzo(b)fluoranthene	**0.04**
Benzo(k)fluoranthene	**0.03**
Chrysene	**0.04**
PCBs (µg/L)	
Total PCBs	ND
Pesticides (µg/L)	
Total Pesticides	ND
Total Metals (µg/L)	
Arsenic, Total	**69**
Beryllium, Total	**4**
Cadmium, Total	**6**
Chromium, Total	**2,350**
Copper, Total	**461**
Iron, Total	**212,000**
Lead, Total	**664**
Magnesium, Total	**60,900**
Manganese, Total	**1,820**
Mercury, Total	**1**
Nickel, Total	**150**
Sodium, Total	**92,900**
Thallium, Total	**1**
Dissolved Metals (µg/L)	
Sodium, Dissolved	**65,800**

Location	MW3		
Sample Name	MW3	MW3_112917	
Sampling Date	7/28/2015	11/29/2017	
VOCs (µg/L)			
1,2,4-Trimethylbenzene	**7.4**	NE	
cis-1,2-Dichloroethene	**16**	NE	
Naphthalene	**31**	NE	
Trichloroethene	**6.9**	ND	
Vinyl chloride	**15**	**5.1**	
SVOCs (µg/L)			
Benz(a)anthracene	**2.8**	ND	
Benzo(b)fluoranthene	**1.7**	ND	
Benzo(k)fluoranthene	**0.42**	ND	
Bis(2-chloroethyl)ether	ND	**2**	UJ
Chrysene	**3.7**	ND	
Hexachlorocyclopentadiene	ND	**20**	UJ
Indeno(1,2,3-cd)pyrene	**0.69**	ND	
Napthalene	**23**	NE	
PCBs (µg/L)			
Total PCBs	ND	NA	
Pesticides (µg/L)			
Total Pesticides	ND	NA	
Total Metals (µg/L)			
Iron, Total	**25,600**	**20300**	
Lead, Total	**40**	NE	
Manganese, Total	**544**	**495.6**	
Sodium, Total	**13,400**	NE	
Dissolved Metals (µg/L)			
Iron, Dissolved	NE	**18600**	
Manganese, Dissolved	**475**	**467.9**	
Sodium	**14,200**	NE	

Location	16MW2			
Sample Name	16MW2_112917		GWDUP01_112917	
Sampling Date	11/29/2017		11/29/2017	
VOCs (µg/L)				
Trichloroethene	NE		**5.5**	
SVOCs (µg/L)				
Benzo(a)anthracene	**0.05**	J	**0.04**	J
Benzo(b)fluoranthene	**0.06**	J	**0.04**	J
Bis(2-chloroethyl)ether	**2**	UJ	ND	
Chrysene	**0.05**	J	ND	
Hexachlorocyclopentadiene	**20**	UJ	**20**	UJ
Total Metals (µg/L)				
Iron, Total	**6070**		**9620**	
Lead, Total	**138.4**		**359**	
Manganese, Total	**553.8**		**572.6**	
Mercury, Total	**7.3**		**20.05**	
Sodium, Total	**60600**		**69700**	
Dissolved Metals (µg/L)				
Iron, Dissolved	**4030**		**4120**	
Manganese, Dissolved	**506**		**496**	
Sodium, Dissolved	**61700**		**62500**	

LEGEND:

▭	APPROXIMATE BCP SITE BOUNDARY
16MW1 ▲	RI MONITORING WELL LOCATION
MW3 ▲	EXISTING MONITORING WELL LOCATION (EBC JULY 2015)
MW1 ▲	PHASE II MONITORING WELL (EBC JULY 2015)

GENERAL NOTES:

1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. REMEDIAL INVESTIGATION BORING/SAMPLE LOCATIONS ARE APPROXIMATE. PREVIOUS SAMPLE LOCATIONS WERE ESTIMATED BY REFERENCING THE FEBRUARY 8, 2017 REMEDIAL INVESTIGATION WORK PLAN, PREPARED BY ENVIRONMENTAL BUSINESS CONSULTANTS (EBC).
3. GROUNDWATER ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES (SGVs) FOR CLASS GA - DRINKING WATER.
4. CONCENTRATIONS DETECTED ABOVE CLASS GA SGVs ARE BOLDED AND SHADED.
5. DUPLICATE IS A DUPLICATE OF PARENT SAMPLE MW4.
6. GWDUP01_112917 IS A DUPLICATE OF THE PARENT SAMPLE 16MW2_112917.
7. VOCs = VOLATILE ORGANIC COMPOUNDS
8. SVOCs = SEMIVOLATILE ORGANIC COMPOUNDS
9. PCBs = POLYCHLORINATED BIPHENYLS
10. µg/L = MICROGRAM PER LITER
11. ND = NOT DETECTED
12. NE = NO EXCEEDANCE
13. NA = NOT ANALYZED
14. J = ANALYTE DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT BUT BELOW THE REPORTING LIMIT AND THEREFORE THE DATA IS ESTIMATED.
15. UJ = THE ANALYTE WAS NOT DETECTED AT A LEVEL GREATER THAN OR EQUAL TO THE REPORTING LIMIT (RL); HOWEVER, THE REPORTED RL IS APPROXIMATE AND MAY BE INACCURATE OR IMPRECISE.

Analyte	NYSDEC TOGS SGVs - Class GA
VOCs (µg/L)	
1,1-Dichloroethane	5
1,2,4-Trimethylbenzene	5
cis-1,2-Dichloroethene	5
Naphthalene	10
Trichloroethene	5
Vinyl chloride	2
SVOCs (µg/L)	
Benzo(a)anthracene	0.002
Benzo(a)pyrene	0.002
Benzo(b)fluoranthene	0.002
Benzo(k)fluoranthene	0.002
Chrysene	0.002
Indeno(1,2,3-cd)pyrene	0.002
Naphthalene	10
Metals (µg/L)	
Arsenic	25
Beryllium	3
Cadmium	5
Chromium	50
Copper	200
Iron	300
Lead	25
Magnesium	35,000
Manganese	300
Mercury	0.7
Nickel	100
Sodium	20000
Thallium	0.5

40 0 10 25 40
SCALE IN FEET

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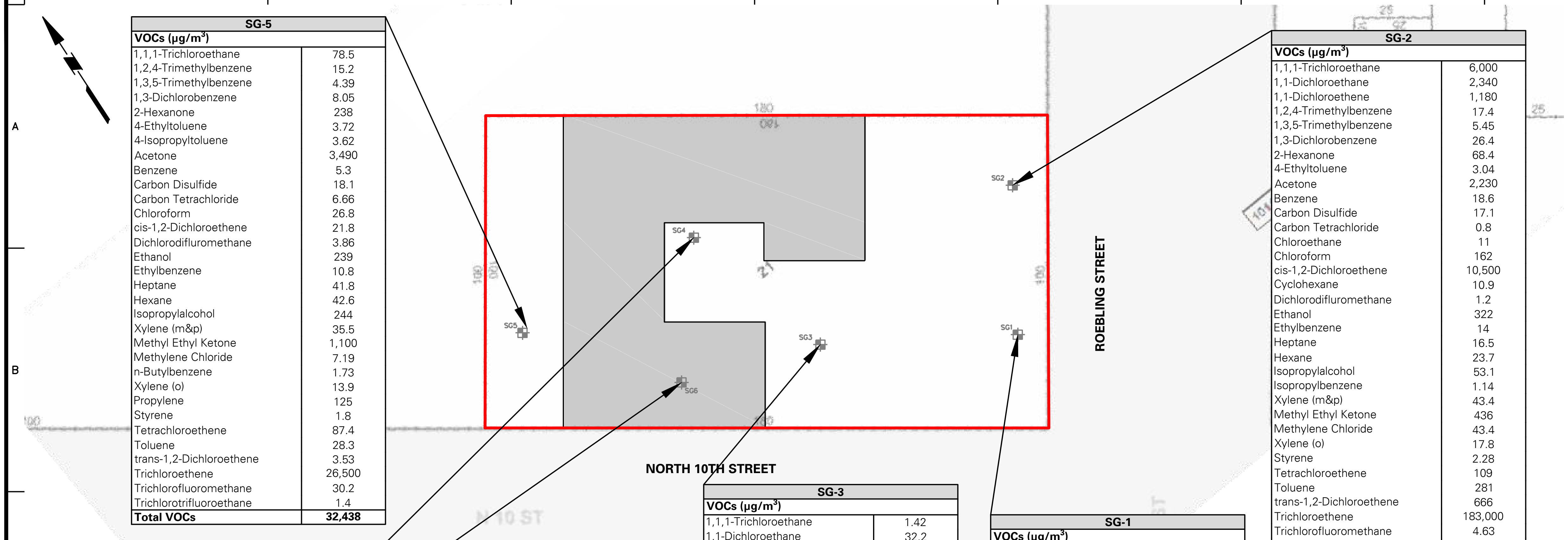
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
215 NORTH 10TH STREET
BLOCK No. 2299, LOT No. 21
BROOKLYN
KINGS **NEW YORK**

Figure Title
GROUNDWATER SAMPLE LOCATIONS AND RESULTS MAP

Project No. 170482201
Date 11/30/2017
Scale 1" = 40'
Drawn By KN
Checked By AT
Submission Date JANUARY 2018
Figure No. 9
Sheet 9 of 10

Filename: C:\Users\atashji\Documents\Figures 5-8 - Sample Location and Results Map_revised.dwg Date: 2/28/2018 Time: 14:33 User: atashji Style Table: Langan.stb Layout: Fig 9 - Gw Tag Map



SG-5	
VOCs (µg/m³)	
1,1,1-Trichloroethane	78.5
1,2,4-Trimethylbenzene	15.2
1,3,5-Trimethylbenzene	4.39
1,3-Dichlorobenzene	8.05
2-Hexanone	238
4-Ethyltoluene	3.72
4-Isopropyltoluene	3.62
Acetone	3,490
Benzene	5.3
Carbon Disulfide	18.1
Carbon Tetrachloride	6.66
Chloroform	26.8
cis-1,2-Dichloroethene	21.8
Dichlorodifluromethane	3.86
Ethanol	239
Ethylbenzene	10.8
Heptane	41.8
Hexane	42.6
Isopropylalcohol	244
Xylene (m&p)	35.5
Methyl Ethyl Ketone	1,100
Methylene Chloride	7.19
n-Butylbenzene	1.73
Xylene (o)	13.9
Propylene	125
Styrene	1.8
Tetrachloroethene	87.4
Toluene	28.3
trans-1,2-Dichloroethene	3.53
Trichloroethene	26,500
Trichlorofluoromethane	30.2
Trichlorotrifluoroethane	1.4
Total VOCs	**32,438**

SG-2	
VOCs (µg/m³)	
1,1,1-Trichloroethane	6,000
1,1-Dichloroethane	2,340
1,1-Dichloroethene	1,180
1,2,4-Trimethylbenzene	17.4
1,3,5-Trimethylbenzene	5.45
1,3-Dichlorobenzene	26.4
2-Hexanone	68.4
4-Ethyltoluene	3.04
Acetone	2,230
Benzene	18.6
Carbon Disulfide	17.1
Carbon Tetrachloride	0.8
Chloroethane	11
Chloroform	162
cis-1,2-Dichloroethene	10,500
Cyclohexane	10.9
Dichlorodifluromethane	1.2
Ethanol	322
Ethylbenzene	14
Heptane	16.5
Hexane	23.7
Isopropylalcohol	53.1
Isopropylbenzene	1.14
Xylene (m&p)	43.4
Methyl Ethyl Ketone	436
Methylene Chloride	43.4
Xylene (o)	17.8
Styrene	2.28
Tetrachloroethene	109
Toluene	281
trans-1,2-Dichloroethene	666
Trichloroethene	183,000
Trichlorofluoromethane	4.63
Trichlorotrifluoroethane	1.38
Vinyl Chloride	544
Total VOCs	**208,172**

LEGEND:

🟥	APPROXIMATE BCP SITE BOUNDARY
SG1 ⊞	PHASE II SOIL VAPOR LOCATION (EBC JULY 2015)
▨	APPROXIMATE BUILDING BOUNDARIES

GENERAL NOTES:

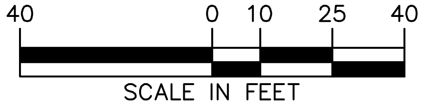
1. BASE MAP TAKEN FROM HTTP://GIS.NYC.GOV/TAXMAP/MAP.HTM
2. REMEDIAL INVESTIGATION SOIL VAPOR SAMPLE LOCATIONS ARE APPROXIMATE. PREVIOUS SAMPLE LOCATIONS WERE ESTIMATED BY REFERENCING THE AUGUST 2015 PHASE II ENVIRONMENTAL SITE ASSESSMENT, PREPARED BY ENVIRONMENTAL BUSINESS CONSULTANTS (EBC).
3. ONLY DETECTED CONCENTRATIONS ARE SHOWN.
4. BCP = BROWNFIELD CLEANUP PROGRAM
5. µg/m^3 = MICROGRAMS PER CUBIC METER
6. VOCs = VOLATILE ORGANIC COMPOUNDS

SG-4	
VOCs (µg/m³)	
1,1,1-Trichloroethane	205
1,1-Dichloroethane	5.82
1,1-Dichloroethene	1,240
1,2,4-Trimethylbenzene	17.1
1,3,5-Trimethylbenzene	5.31
1,3-Dichlorobenzene	27.6
4-Ethyltoluene	3.27
4-Methyl-2-pentanone	3.5
Acetone	1,470
Benzene	22.9
Carbon Disulfide	101
Carbon Tetrachloride	6,350
Chloroform	1,950
Chloromethane	1.7
cis-1,2-Dichloroethene	6,260
Dichlorodifluromethane	1.56
Ethanol	241
Ethylbenzene	12.6
Heptane	12.1
Hexane	22.8
Isopropylalcohol	28.3
Isopropylbenzene	1.18
Xylene (m&p)	40.8
Methyl Ethyl Ketone	245
Methylene Chloride	64.2
Xylene (o)	16.7
Styrene	2.15
Tetrachloroethene	1,790
Toluene	34.9
trans-1,2-Dichloroethene	539
Trichloroethene	243,000
Trichlorofluoromethane	3.71
Trichlorotrifluoroethane	2.54
Vinyl Chloride	212
Total VOCs	**263,934**

SG-6	
VOCs (µg/m³)	
1,1,1-Trichloroethane	154
1,2,4-Trimethylbenzene	13
1,3,5-Trimethylbenzene	3.92
1,3-Dichlorobenzene	3.4
2-Hexanone	9.95
4-Ethyltoluene	3.11
4-Isopropyltoluene	3.34
4-Methyl-2-pentanone	1.78
Acetone	153
Benzene	5.4
Carbon Tetrachloride	0.31
Cyclohexane	2.07
Dichlorodifluromethane	1.4
Ethanol	169
Ethylbenzene	11.8
Heptane	7.58
Hexane	7.01
Isopropylalcohol	13.6
Xylene (m&p)	37.1
Methyl Ethyl Ketone	84.9
Methylene Chloride	4.17
n-Butylbenzene	1.22
Xylene (o)	14.4
Styrene	1.79
Tetrachloroethene	77.3
Toluene	36.9
Trichloroethene	24.6
Trichlorofluoromethane	5.1
Trichlorotrifluoroethane	7.59
Total VOCs	**858.74**

SG-3	
VOCs (µg/m³)	
1,1,1-Trichloroethane	1.42
1,1-Dichloroethane	32.2
1,2,4-Trimethylbenzene	9.04
1,3,5-Trimethylbenzene	13.8
1,3-Dichlorobenzene	6.67
4-Ethyltoluene	7.96
4-Isopropyltoluene	2.89
Acetone	2210
Benzene	20.3
Carbon Disulfide	10
Carbon Tetrachloride	0.28
Chloroethane	25.9
Chloroform	1.21
cis-1,2-Dichloroethene	40.8
Cyclohexane	344
Ethanol	260
Ethylbenzene	11.8
Heptane	311
Hexane	609
Isopropylalcohol	52.3
Isopropylbenzene	2.84
m- &p-Xylenes	38.8
Methyl Ethyl Ketone	492
Methylene Chloride	6.28
o-Xylene	17.2
sec-Butylbenzene	4.22
Tetrachloroethene	203
Toluene	35.7
trans-1,2-Dichloroethene	22
Trichloroethene	119
Trichlorofluoromethane	2.23
Trichlorotrifluoroethane	2.28
Vinyl Chloride	77.9
Total VOCs	**4,994**

SG-1	
VOCs (µg/m³)	
1,1,1-Trichloroethane	29.5
1,1-Dichloroethane	736
1,1-Dichloroethene	1,310
1,2,4-Trimethylbenzene	13.6
1,3,5-Trimethylbenzene	3.96
1,3-Dichlorobenzene	20.8
4-Ethyltoluene	3.33
4-Isopropyltoluene	4.12
Acetone	6,430
Benzene	101
Carbon Disulfide	97.7
cis-1,2-Dichloroethene	11,000
Ethanol	286
Ethylbenzene	13
Heptane	1,120
Hexane	5,110
Isopropylalcohol	56
Isopropylbenzene	1.04
Xylene (m&p)	41
Methyl Ethyl Ketone	383
Methylene Chloride	219
n-Butylbenzene	2.44
Xylene (o)	19
Tetrachloroethene	7,730
Toluene	58
trans-1,2-Dichloroethene	2,710
Trichloroethene	2,980
Trichlorofluoromethane	2.27
Trichlorotrifluoroethane	1.8
Vinyl Chloride	1,650
Total VOCs	**42,133**



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Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project

215 NORTH 10TH STREET

BLOCK No. 2299, LOT No. 21
BROOKLYN
KINGS NEW YORK

Figure Title

SOIL VAPOR SAMPLE LOCATIONS AND RESULTS MAP

Project No. 170482201
Date 11/30/2017
Scale 1"= 40'
Drawn By KN
Checked By AT
Submission Date JANUARY 2018
Figure No. 10
Sheet 10 of 10

Appendix A

Previous Environmental Reports

Appendix B

Photograph Log

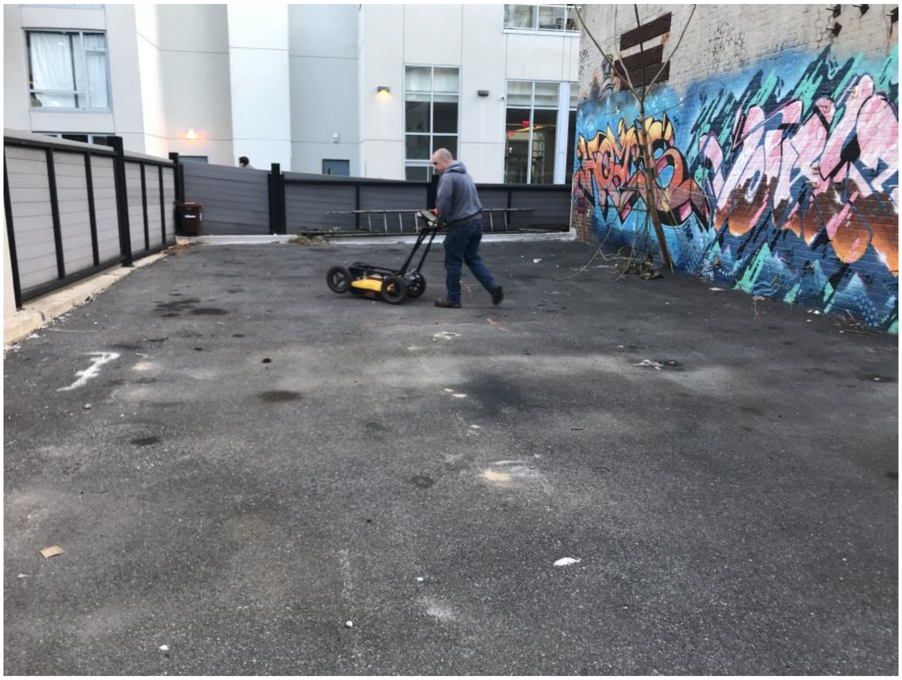

Photo 1, 11/20/2017: NOVA performing a ground-penetrating radar survey over the the potential underground storage tank location, facing northeast.

Photo 2, 11/20/2017: Soil recovery from soil boring 16B2, facing down.

Photo 3, 11/20/2017: Soil recovery and product observed within soil boring 16B1 (8 to 12 feet bgs), facing down.

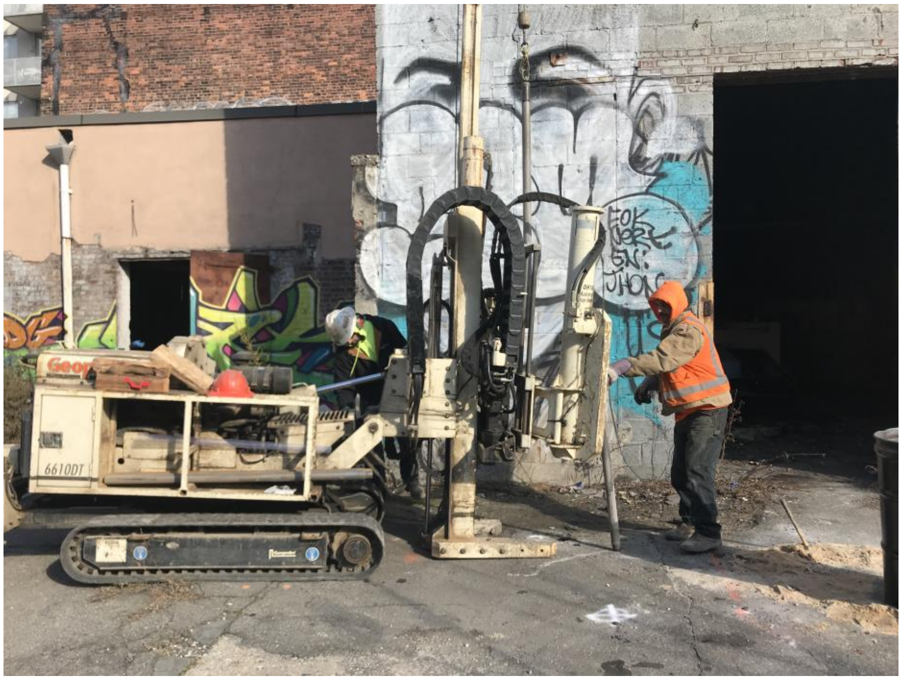

Photo 4, 11/20/2017: AARCO advancing soil boring 16B9 using a Geoprobe 6610DT, facing northeast.

Photo 5, 11/20/2017: View of soil recovery from soil boring 16B11, facing down.

Photo 6, 11/20/2017: AARCO advancing soil boring 16B5 using a Geoprobe 6610DT, facing east.

Photo 7, 11/21/2017: AARCO installing groundwater monitoring well 16MW3, facing west.

Photo 8, 11/21/2017: AARCO developing groundwater monitoring well 16MW3, facing northwest.

Photo 9, 11/21/2017: Downwind air monitoring station, facing east.

Photo 10, 11/21/2017: Clay interval observed at about 15' bgs within soil boring 16MW2, facing down.

Photo 11, 11/21/2017: Soil recovery from soil boring 16B3 (0 to 8 feet bgs), facing down.

Photo 12, 11/21/2017: AARCO advancing soil boring 16B4 using a Geoprobe 6610DT, facing south.

Photo 13, 11/21/2017: Soil recovery from soil boring 16B12, facing down.

Photo 14, 3/12/2017: Finished manhole cover for monitoring well 16MW3.

Photo 15, 11/29/2017: Groundwater sampling at monitoring well 16MW2, facing down.

Photo 16, 11/29/2017: Drummed purge groundwater staged onsite pending disposal, facing south.

Appendix C

NOVA Geophysical Engineering Survey Report

GEOPHYSICAL ENGINEERING SURVEY REPORT

Commercial Property
215 North 10th Street
Brooklyn, New York 11211

NOVA PROJECT NUMBER
17-0485

DATED
November 27, 2017

PREPARED FOR:
LANGAN
21 Penn Plaza
360 W 31st Street, 8th Floor
New York, New York 10001

PREPARED BY:

NOVA
GEOPHYSICAL
ENGINEERING
Subsurface Mapping Solutions

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www.nova-gsi.com

November 27, 2017

Albert Tashji, P.E., LEED GA
Project Engineer
LANGAN
21 Penn Plaza
360 W 31st Street, 8th Floor
New York, New York 10001
Direct: 212.479.5508

Re: Geophysical Engineering Survey (GES) Report
Commercial Property
215 North 10th Street
Brooklyn, New York 11211

Dear Mr. Tashji:

Nova Geophysical Services (NOVA) is pleased to provide findings of the geophysical engineering survey (GES) at the above referenced project site: Commercial Property, 215 North 10th Street, Brooklyn, New York (the “Site”). Please see attached Site Location and Geophysical Survey maps for more details.

INTRODUCTION TO GEOPHYSICAL ENGINEERING SURVEY (GES)

NOVA performed a Geophysical engineering surveys (GES) consisting of a Ground Penetrating Radar (GPR) survey at the site. The purpose of this survey is to locate and identify USTs, anomalies, utilities and other substructures and to clear and mark proposed environmental boring areas on November 20, 2017.

The equipment selected for this investigation was a Noggin 250 MHz ground penetrating radar (GPR) shielded antenna and 3M DYANTL (EM).

A GPR system consists of a radar control unit, control cable and a transducer (antenna). The control unit transmits a trigger pulse at a normal repetition rate of 250 MHz. The trigger pulse is sent to the transmitter electronics in the transducer via the control cable. The transmitter electronics amplify the trigger pulses into bipolar pulses that are radiated to the surface. The transformed pulses vary in shape and frequency according to the transducer used. In the subsurface, variations of the signal occur at boundaries where there is a dielectric contrast (void, steel, soil type, etc.). Signal reflections travel back to the control unit and are represented as color graphic images for interpolation.

GEOPHYSICAL METHODS

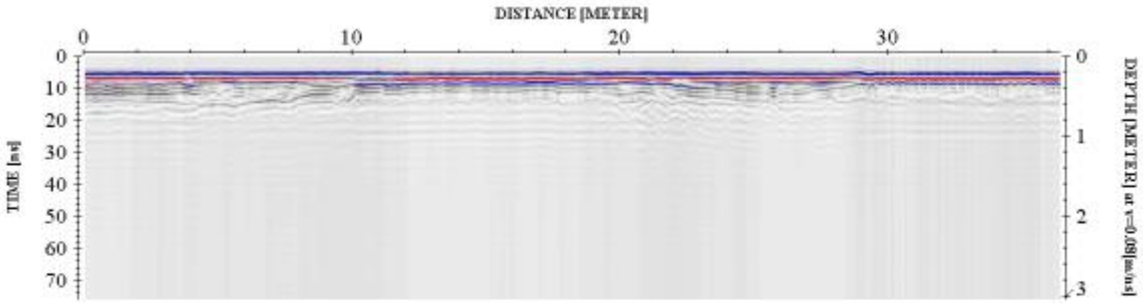
The project site was screened using the GPR to search the entire area and inspected for reflections, which could be indicative of major anomalies and substructures.

GPR data profiles were collected for the areas of the Site specified by the client. The surveyed areas consisted of dirt/gravel, concrete and asphalt surfaces.

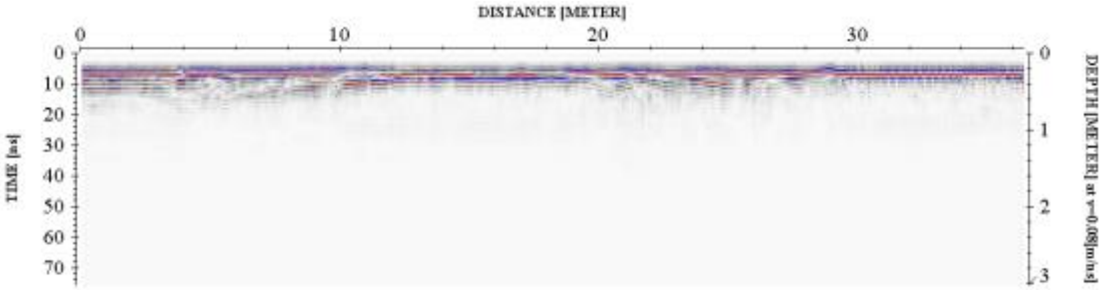
DATA PROCESSING

In order to improve the quality of the results and to better identify subsurface anomalies NOVA processed the collected data. The processes flow is briefly described at this section.

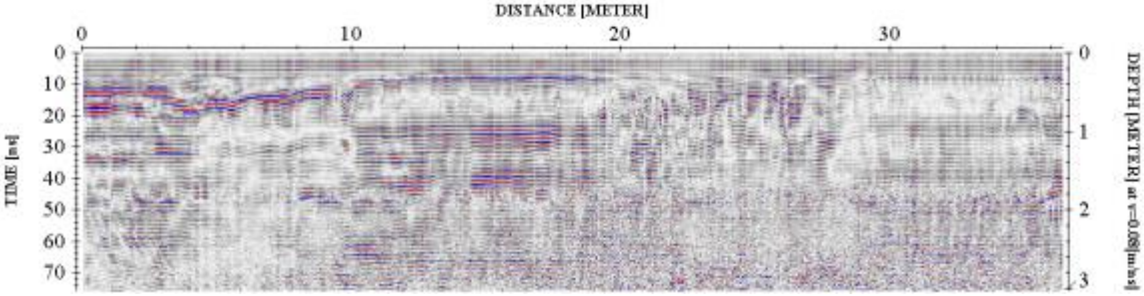
Step 1. Import raw RAMAC data to standard processing format



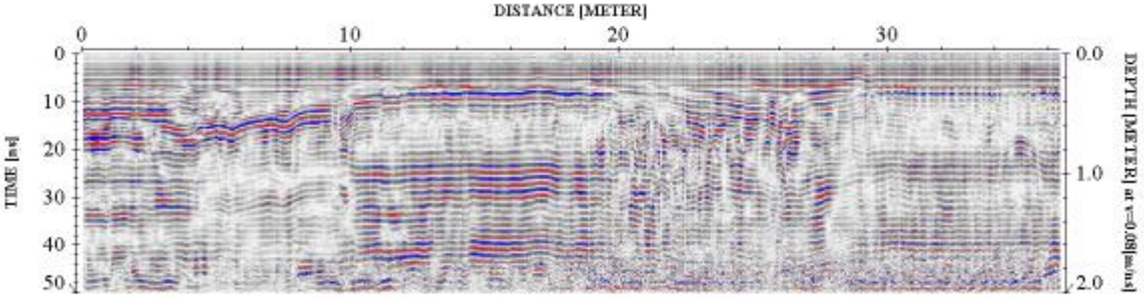
Step 2. Remove instrument noise *(dewow)*



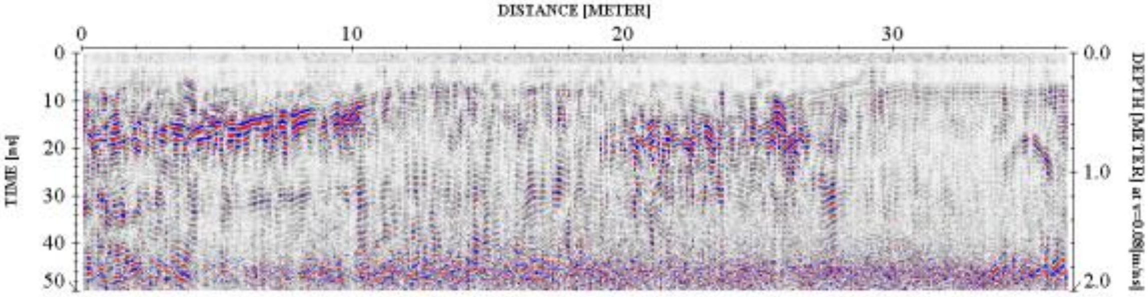
Step 3. Correct for attenuation losses *(energy decay function)*



Step 4. Remove static from bottom of profile *(time cut)*



Step 5. Mute horizontal ringing/noise *(subtracting average)*



The above example shows the significance of data processing. The last image (step 5) has higher resolution than the starting image (raw data – step 1) and describes the subsurface anomalies more accurately.

PHYSICAL SETTINGS

Nova observed following physical conditions at the time of the survey:

The weather: Clear Skies

Temp: 35 Degrees (F).

Surface: Dirt/gravel, concrete surfaces and asphalt

Geophysical Noise Level (GNL): Geophysical Noise Level (GNL) was medium to high at the site. The noise was a result of the site being located in an urban environment, a heavy concrete slab and debris/thick vegetation.

RESULTS

The results of the geophysical engineering survey (GES) identified following at the project Site:

- GES survey identified scattered anomalies located throughout the project site. Based on their rates and proximity, these anomalies were inconsistent with any USTs. These areas were indicated on the on-site markout.
- Several utilities (sewer, gas, water and electric) were located on the site. These utilities were marked out both at the site and on the survey map (subsurface only).
- A large anomaly, potentially consistent with a UST, was located on the site. This is indicated both on-site and on the survey map.
- Geophysical Survey Plan portrays the areas investigated during the geophysical survey.

If you have any questions please do not hesitate to contact the undersigned.
Sincerely,

NOVA Geophysical Services

Levent Eskicakit, P.G., E.P.
Project Engineer

Attachments:
Figure 1 Site Location Map
Geophysical Survey Plan
Geophysical Images

FIGURE 1

SITE LOCATION MAP

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www.nova-gsi.com

SITE: **Commercial Property**
215 North 10th Street
Brooklyn, New York 11211

SCALE: See Map

1- All anomalies were marked in the field.

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718-261-1527(FAX)
www.nova-gsi.com

GEOPHYSICAL SURVEY PLAN

SITE : **Commercial Property**
215 North 10th Street
Brooklyn, New York 11211

CLIENT: **LANGAN**
DATE: November 20, 2017
Scale See Map

INFORMATION

🟥	**Survey Area**	🟨	**Gas Line**
🟥	**Electric Line**	🟦	**Water Line**
🟩	**Sewer Line**	🟨	**Large Anomaly**

N

20 ft.

GEOPHYSICAL IMAGES

Commercial Property
215 North 10th Street
Brooklyn, New York 11211
November 20th, 2017

GEOPHYSICAL IMAGES

Commercial Property
215 North 10th Street
Brooklyn, New York 11211
November 20th, 2017

GEOPHYSICAL IMAGES

Commercial Property
215 North 10th Street
Brooklyn, New York 11211
November 20th, 2017

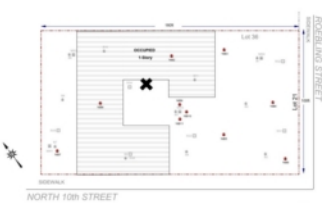
Appendix D

Soil Boring Logs

LANGAN

Log of Boring **16B1** Sheet 1 of 1

Project: 215 North 10th Street
Project No.: 170482201
Location: Brooklyn, New York
Elevation and Datum: 8.5 NAVD88
Drilling Company: AARCO Environmental Services, Inc.
Date Started: 11/20/17
Date Finished: 11/20/17
Drilling Equipment: Geoprobe 6610 DT
Completion Depth: 15 ft
Rock Depth: NA
Size and Type of Bit: 2-inch O.D. Direct Push
Number of Samples: Disturbed 4 Undisturbed NA Core NA
Casing Diameter (in): NA
Casing Depth (ft): NA
Water Level (ft.): First ▽ 7 Completion ▼ NA 24 HR. ▼ NA
Casing Hammer: NA Weight (lbs): NA Drop (in): NA
Drilling Foreman: Tim Kelly
Sampler: 2-inch I.D. by 4-foot-long Macrocore
Sampler Hammer: NA Weight (lbs): NA Drop (in): NA
Field Engineer: Kim Nagotko

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.5		0						
	+8.3	R1a (0-2") CONCRETE SLAB R1b (2-18") Loose, dark brown, medium SAND, trace fine gravel, trace coal fragments, brick fragments (dry) [FILL] R1c (18-20") Loose, reddish-brown, fine SAND, trace coal fragments, brick fragments (dry) [FILL]	1 2 3 4	R1	MACROCORE	20/48	NA	3.6 2.4 2.1	 NORTH 10th STREET 1035: Collect 16B1_0-2
		R2a (0-13") Loose, dark greyish brown, medium SAND, trace fine gravel, trace organics, brick fragments (dry) [FILL] R2b (13-19") Loose, light brown, fine SAND, trace silt, brick fragments (dry) [FILL] ▽ R2c (19-33") Loose, dark grey, medium SAND, some fine gravel, trace coal fragments (moist) [FILL] R2d (33-40") Loose, olive, medium SAND, some fine sand, some fine gravel, trace silt, trace coal fragments (moist) [FILL]	5 6 7 8	R2	MACROCORE	40/48	NA	0.7 29.7 30.1 60.5 103.7 84.2	1100: Collect 16B1_7-8 Product, petroleum-like odors, staining
			9 10	R3	MACROCORE	10/48	NA		
	-2.5	R3 (0-10") Loose, dark grey, silty SAND, trace fine gravel (moist)	11					46.8 57.2	1110: Collect 16B1_11-12 Product, petroleum-like odors, staining
	-3.5	R4 (0-36") Soft, grey, CLAY, trace organics, trace shells (moist)	12 13 14	R4	MACROCORE	36/36	NA	57.5 55.1 34.2 10.4 1.1	Product, petroleum-like odors from about 0-20" 1120: Collect 16B1_14-15
	-6.5	End of Boring	15 16 17 18 19 20						End of boring at about 15' bgs. Backfilled boring using clean soil cuttings to grade.

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Log of Boring **16B2** Sheet 1 of 1

Project 215 North 10th Street		Project No. 170482201	
Location Brooklyn, New York		Elevation and Datum 8.5 NAVD88	
Drilling Company AARCO Environmental Services, Inc.		Date Started 11/20/17	Date Finished 11/20/17
Drilling Equipment Geoprobe 6610 DT		Completion Depth 15 ft	Rock Depth NA
Size and Type of Bit 2-inch O.D. Direct Push		Number of Samples	Disturbed 4 / Undisturbed NA / Core NA
Casing Diameter (in) NA	Casing Depth (ft) NA	Water Level (ft.)	First ∇ 7.5 / Completion ▼ NA / 24 HR. ▼ NA
Casing Hammer NA / Weight (lbs) NA	Drop (in) NA	Drilling Foreman Tim Kelly	
Sampler 2-inch I.D. by 4-foot-long Macrocore		Field Engineer Kim Nagotko	
Sampler Hammer NA / Weight (lbs) NA	Drop (in) NA		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.5	R1a (0-4") CONCRETE SLAB	0						
	+7.5	R1b (4-12") Loose, crushed CONCRETE	1					2.5 2.9	
		+/- 1.5' VOID	2	R1	MACROCORE	14/48	NA		
	+6.0		3						
			4						Three additional exploratory borings were advanced adjacent to soil boring 16B2 to verify void.
			5						
	+2.5	R2a (0-6") Loose, dark brown, medium SAND, some fine sand, trace fine gravel, trace silt, trace glass, brick fragments (moist) [FILL]	6	R2	MACROCORE	12/48	NA		
		R2b (6-12") Loose, reddish-brown, fine SAND, some silt, trace fine gravel (wet) [FILL] ∇	7					0.7 4.4	0930: Collect 16B2_7-8
			8						
			9						
		R3a (0-13") Loose, grey, fine SAND, some fine gravel, some silt, trace clay, trace shell fragments (wet)	10	R3	MACROCORE	22/48	NA	11.1 12.4	
	-2.5	R3b (13-22") Loose, black, SILT, trace fine gravel, trace fine sand (moist)	11					16.1 10.4	0935: Collect 16B2_11-12 Petroleum-like odors, staining
			12						
	-4.3	R4a (0-16") Loose, dark greyish olive, silty SAND, some fine gravel (wet)	13	R4	MACROCORE	28/36	NA	9.6 7.4	1005: Collect 16B2_13-14 Rainbow sheen on water, staining, petroleum-like odors
	-5.5	R4b (16-28") Soft, grey, CLAY, trace organics (moist)	14					3.3	Organic -like odor 1010: Collect 16B2_14-15
	-6.5	End of Boring	15						End of boring at ~15' bgs. Boring and offsets could not be backfilled due to voids. Wooden planks were placed over boring locations.
			16						
			17						
			18						
			19						
			20						

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Log of Boring **16B3** Sheet 1 of 1

Project 215 North 10th Street		Project No. 170482201	
Location Brooklyn, New York		Elevation and Datum 8.6 NAVD88	
Drilling Company AARCO Environmental Services, Inc.		Date Started 11/21/17	Date Finished 11/21/17
Drilling Equipment Geoprobe 6610 DT		Completion Depth 15 ft	Rock Depth NA
Size and Type of Bit 2-inch O.D. Direct Push		Number of Samples: Disturbed 4	Undisturbed NA; Core NA
Casing Diameter (in) NA	Casing Depth (ft) NA	Water Level (ft.): First ▽ 6.5	Completion ▼ NA; 24 HR. ▼ NA
Casing Hammer NA; Weight (lbs) NA	Drop (in) NA	Drilling Foreman Tim Kelly	
Sampler 2-inch I.D. by 4-foot-long Macrocore			
Sampler Hammer NA; Weight (lbs) NA	Drop (in) NA	Field Engineer Kim Nagotko	

MATERIAL SYMBOL	Elev. (ft) +8.6	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
		R1 (0-32") Loose, dark brown, medium SAND, trace fine sand, trace organics, trace coal fragments, trace fine gravel, brick and concrete fragments (dry) [FILL]	0–4	R1	MACROCORE	32/48	NA	0.0 0.0 0.3 0.4 0.9	 1225: Collect 16B3_0-2 1230: Collect SOMS_16B3_0-2 1235: Collect SOMSD_16B3_0-2
		R2a (0-17") Loose, dark greyish brown, medium SAND, some coal fragments, trace fine sand, concrete fragments (dry) [FILL] R2b (17-24") Loose, brown, medium SAND, trace fine sand, trace coal fragments, trace glass, concrete fragments (dry) [FILL] ▽ R2c (24-29") Loose, grey, fine SAND, trace fine gravel, trace silt, trace organics (moist) [FILL] R2d (29-42") Loose, black, fine SAND, trace silt, trace fine gravel, trace organics (moist) [FILL]	4–8	R2	MACROCORE	42/48	NA	1.2 1.8 1.4 1.6 3.5 634.1 457.7 10.8	1240: Collect 16B3_7-8 Petroleum-like odors, black staining
	-1.4 -1.9 -3.4	R3a (0-6") Loose, black, medium SAND, some fine gravel, some fine sand (wet) R3b (6-24") Loose, olive, silty SAND, trace fine gravel (moist)	8–12	R3	MACROCORE	24/48	NA	65.2 9.1 3.4 9.6 1.2	Black staining, petroleum-like odors 1245: Collect 16B3_10.5-11.5
		NO RECOVERY	12–15	R4	MACROCORE	0/36	NA		
		End of Boring	15–20						End of boring at ~15' bgs. Backfilled boring using clean soil cuttings to grade.

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Log of Boring **16B4** Sheet 1 of 1

Project 215 North 10th Street			Project No. 170482201		
Location Brooklyn, New York			Elevation and Datum 8.75 NAVD88		
Drilling Company AARCO Environmental Services, Inc.			Date Started 11/21/17	Date Finished 11/21/17	
Drilling Equipment Geoprobe 6610 DT			Completion Depth 15 ft	Rock Depth NA	
Size and Type of Bit 2-inch O.D. Direct Push			Number of Samples	Disturbed 4	Undisturbed NA · Core NA
Casing Diameter (in) NA		Casing Depth (ft) NA	Water Level (ft.)	First ▽ 6.5	Completion ▼ NA · 24 HR. ▼ NA
Casing Hammer NA	Weight (lbs) NA	Drop (in) NA	Drilling Foreman Tim Kelly		
Sampler 2-inch I.D. by 4-foot-long Macrocore			Field Engineer Kim Nagotko		
Sampler Hammer NA	Weight (lbs) NA	Drop (in) NA			

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.8								
	+8.4	R1a (0-4") Loose, dark brown, medium SAND, some fine sand, some organics (dry) [FILL]	0	R1	MACROCORE	28/48	NA	0.0 0.0 0.0 0.0 0.0	
	+7.9	R1b (4-9") CONCRETE	1						
		R1c (9-29") Loose, dark grey to greyish brown, medium SAND, some fine sand, some fine gravel, trace coal fragments, concrete fragments (dry) [FILL]	2 3						1320: Collect 16B4_3-4 and Collect SODUP02_112117
			4 5	R2	MACROCORE	24/48	NA		
		R2a (0-10) Loose, dark grey, medium SAND, some fine sand, some fine gravel, trace coal fragments (dry) [FILL] ▽	6					0.4 1.4	
	+0.8	R2b (10-24") Loose, olive, fine SAND, some silt, trace coal fragments, trace fine gravel (moist) [FILL]	7					1.2 0.4	
	-1.3	R3a (0-23") Loose, olive, silty SAND, trace fine gravel (wet)	8 9	R3	MACROCORE	48/48	NA	0.3 0.1 0.1	
	-1.8	R3b (23-27") Loose, fine GRAVEL (wet)	10					0.5	
		R3c (27-48") Loose, dark greyish olive, silty SAND, 2-inch red gravel bed layer from about 35 to 37" (moist)	11					0.2 0.3 0.1	1325: Collect 16B4_11-12
			12 13	R4	MACROCORE	6/36	NA		
	-6.3	R4 (0-6") Loose, dark grey, silty SAND, some fine gravel (wet)	14					0.5	1335: Collect 16B4_14.5-15
		End of Boring	15 16 17 18 19 20						End of boring at ~15' bgs. Backfilled boring using clean soil cuttings to grade.

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Log of Boring **16B5** Sheet 1 of 1

Project: 215 North 10th Street		Project No.: 170482201	
Location: Brooklyn, New York		Elevation and Datum: 8 NAVD88	
Drilling Company: AARCO Environmental Services, Inc.		Date Started: 11/20/17	Date Finished: 11/20/17
Drilling Equipment: Geoprobe 6610 DT		Completion Depth: 15 ft	Rock Depth: NA
Size and Type of Bit: 2-inch O.D. Direct Push		Number of Samples: Disturbed 4; Undisturbed NA; Core NA	
Casing Diameter (in): NA	Casing Depth (ft): NA	Water Level (ft.): First ▽ 8; Completion ▼ NA; 24 HR. ▼ NA	
Casing Hammer: NA	Weight (lbs): NA; Drop (in): NA	Drilling Foreman: Tim Kelly	
Sampler: 2-inch I.D. by 4-foot-long Macrocore		Field Engineer: Kim Nagotko	
Sampler Hammer: NA	Weight (lbs): NA; Drop (in): NA		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.0		0						
	+7.8	R1a (0-2") CONCRETE SLAB R1b (2-6") Loose, brown, medium SAND, some fine sand, trace asphalt, brick fragments (dry) [FILL] R1c (6-11") Loose, tan, medium SAND (moist) [FILL] R1d (11-19") Loose, brown, medium SAND, some fine sand, brick and concrete fragments (dry) [FILL]	0–4	R1	MACROCORE	19/48	NA	2.3 0.9 2.3	
		R2a (0-12") Loose, light brown, medium SAND, trace fine sand, trace fine gravel, brick and concrete fragments (dry) [FILL]	4–8	R2	MACROCORE	32/48	NA	4.8 3.4 2.7 2.7 1.7 1.0	1250: Collect 16B5_4.5-5
	+2.0	R2b (12-32") Loose, dark greyish brown, fine SAND, some silt, trace fine gravel (moist)	6						
		▽	8						
			8–12	R3	MACROCORE	11/48	NA	1.3 1.4	
	-3.0	R3 (0-11") Loose, dark greyish olive, silty SAND, some fine gravel (wet)	11						
	-4.0	R4 (0-36") Soft, grey, CLAY, trace organics, trace shells (moist)	12–15	R4	MACROCORE	36/36	NA	1.6 1.6 1.6 1.6 1.6	1255: Collect 16B5_12-13 and Collect SODUP01_112017 1300: Collect 16B5_14-15
	-7.0	End of Boring	15						End of boring at ~15' bgs. Backfilled boring using clean soil cuttings to grade.
			16						
			17						
			18						
			19						
			20						

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Log of Boring **16B6** Sheet 1 of 1

Project 215 North 10th Street		Project No. 170482201	
Location Brooklyn, New York		Elevation and Datum 8 NAVD88	
Drilling Company AARCO Environmental Services, Inc.		Date Started 11/21/17	Date Finished 11/21/17
Drilling Equipment Geoprobe 6610 DT		Completion Depth 15 ft	Rock Depth NA
Size and Type of Bit 2-inch O.D. Direct Push		Number of Samples	Disturbed 4 Undisturbed NA Core NA
Casing Diameter (in) NA	Casing Depth (ft) NA	Water Level (ft.)	First ▽ 6.5 Completion ▼ NA 24 HR. ▼ NA
Casing Hammer NA Weight (lbs) NA Drop (in) NA		Drilling Foreman Tim Kelly	
Sampler 2-inch I.D. by 4-foot-long Macrocore		Field Engineer Kim Nagotko	
Sampler Hammer NA Weight (lbs) NA Drop (in) NA			

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.0	R1a (0-11") Loose, brown, medium SAND, some fine sand, some fine gravel, some coal fragments, trace slag, concrete fragments (dry) [FILL] R2b (11-17") Loose, tan, medium SAND, some coal fragments, concrete fragments (dry) [FILL] R1c (17-21") Loose, reddish-orange, medium SAND, some coal fragments (dry) [FILL] R1d (21-29") Loose, olive, fine SAND, trace fine gravel, trace silt, trace organics, trace wood (moist) [FILL]	0 1 2 3	R1	MACROCORE	29/48	NA	0.2 0.3 0.3 0.3	
		R2 (0-19") Loose, dark grey, medium SAND, some fine sand, trace glass, brick and concrete fragments (moist) [FILL]	4 5 6 ▽ 7	R2	MACROCORE	19/48	NA	1.5 1.2 1.6	1350: Collect 16B6_3-4 1355: Collect SOMS_16B6_3-4 1400: Collect SOMSD_16B6_3-4
	-2.0	R3a (0-20") Loose, olive, fine SAND, trace fine gravel (moist) R3b (20-24") Loose, grey, fine SAND, trace silt, trace fine gravel (moist)	8 9 10 11	R3	MACROCORE	24/48	NA	0.0 0.0 0.0 0.1	1415: Collect 16B6_10-11
	-6.2	R4 (0-6") Loose, olive, silty SAND, trace fine gravel (moist)	12 13 14	R4	MACROCORE	6/36	NA	2.0	1420: Collect 16B6_14.5-15
	-7.0	End of Boring	15 16 17 18 19 20						End of boring at ~15' bgs. Backfilled boring using clean soil cuttings to grade.

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Log of Boring **16B7** Sheet 1 of 1

Project 215 North 10th Street			Project No. 170482201		
Location Brooklyn, New York			Elevation and Datum 9 NAVD88		
Drilling Company AARCO Environmental Services, Inc.			Date Started 11/20/17	Date Finished 11/20/17	
Drilling Equipment Geoprobe 6610 DT			Completion Depth 15 ft	Rock Depth NA	
Size and Type of Bit 2-inch O.D. Direct Push			Number of Samples	Disturbed 4	Undisturbed NA / Core NA
Casing Diameter (in) NA		Casing Depth (ft) NA	Water Level (ft.)	First ▽ 7	Completion ▼ NA / 24 HR. ▼ NA
Casing Hammer NA	Weight (lbs) NA	Drop (in) NA	Drilling Foreman Tim Kelly		
Sampler 2-inch I.D. by 4-foot-long Macrocore			Field Engineer Kim Nagotko		
Sampler Hammer NA	Weight (lbs) NA	Drop (in) NA			

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+9.0		0						
	+8.5	R1a (0-5") ASPHALT, trace organics		R1	MACROCORE	30/48	NA	0.5	
	+8.1	R1b (5-9") CONCRETE SLAB	1					2.3	
		R1c (9-30") Loose, dark brown to reddish-brown, medium SAND, some fine sand, trace fine gravel, trace asphalt, trace coal fragments, trace organics, brick and concrete fragments (dry) [FILL]	2					4.3 2.7	
			3						
			4	R2	MACROCORE	24/48	NA		
			5						
		R2a (0-10") Loose, dark brown, medium SAND, some fine sand, trace fine gravel, trace coal fragments, brick and concrete fragments (moist) [FILL]	6					15.5	Petroleum-like odors
		R2b (10-25") Loose, dark brown, fine SAND, trace organics, trace coal fragments, trace shells, brick fragments (moist) [FILL] ▽	7					388.2 100.4	1430: Collect 16B7_6.5-7.5
			8	R3	MACROCORE	29/48	NA	49.7	
			9						
	-0.5	R3a (0-14") Loose, dark grey, fine SAND, some silt, trace clay (wet)	10					3.3	
	-1.5	R3b (14-29") Loose, greyish-olive, silty SAND (wet)	11					3.4 1.1 1.1	1450: Collect 16B7_11-12
			12	R4	MACROCORE	27/36	NA		
		R4a (0-17") Loose greyish-olive, silty SAND, trace clay (wet)	13					1.8	
	-5.2	R4b (17-27") Soft, grey, CLAY, trace organics (moist)	14					1.9 1.9	
	-6.0	End of Boring	15						End of boring at ~15' bgs. Backfilled boring using clean soil cuttings to grade.
			16						
			17						
			18						
			19						
			20						

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Log of Boring **16B8** Sheet 1 of 1

Project 215 North 10th Street		Project No. 170482201	
Location Brooklyn, New York		Elevation and Datum 8.5 NAVD88	
Drilling Company AARCO Environmental Services, Inc.		Date Started 11/20/17	Date Finished 11/20/17
Drilling Equipment Geoprobe 6610 DT		Completion Depth 15 ft	Rock Depth NA
Size and Type of Bit 2-inch O.D. Direct Push		Number of Samples	Disturbed 4 Undisturbed NA Core NA
Casing Diameter (in) NA	Casing Depth (ft) NA	Water Level (ft.)	First ▽ 6 Completion ▼ NA 24 HR. ▼ NA
Casing Hammer NA Weight (lbs) NA	Drop (in) NA	Drilling Foreman Tim Kelly	
Sampler 2-inch I.D. by 4-foot-long Macrocore		Field Engineer Kim Nagotko	
Sampler Hammer NA Weight (lbs) NA	Drop (in) NA		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data Number	Sample Data Type	Sample Data Recov. (in)	Sample Data Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.5		0						
	+8.1	R1a (0-4") CONCRETE SLAB							
		R1b (0-14") Loose, dark brown, medium SAND, some fine gravel, trace coal fragments, brick and concrete fragments (dry) [FILL]						3.0	
			1					1.1	
			2	R1	MACROCORE	14/48	NA		
			3						1355: Collect 16B8_0-2
			4						
		R2a (0-10") Loose, dark brown, fine SAND. some medium SAND, some silt, trace clay, trace wood fragments, brick fragments (moist) [FILL]	5					5.0	1355: Collect 16B8_5.5-6.5
		R2b (10-19") Soft, tan, fine SAND, some silt, brick fragments (moist) [FILL]	▽ 6	R2	MACROCORE	32/48	NA	3.2 4.7	
		R2c (19-32") Loose, dark brown, fine SAND, trace silt, trace coal fragments, trace fine gravel (moist) [FILL]	7					9.0 15.7	
			8						
			9						
			10	R3	MACROCORE	15/48	NA		
		R3a (0-11") Loose, dark brown, medium SAND, trace fine gravel, brick and concrete fragments (moist) [FILL]	11					4.7 7.0	Organic-like odor
	-3.0	R3b (11-15") Soft, black, PEAT (moist)						9.0	1400: Collect 16B8_11-12
			12						
			13						
		R4 (0-17") Soft, black, PEAT (moist)		R4	MACROCORE	17/36	NA	4.6	
			14					4.9 7.0	1405: Collect 16B8_14-15
	-6.5	End of Boring	15						End of boring at ~15' bgs. Backfilled boring using clean soil cuttings to grade.
			16						
			17						
			18						
			19						
			20						

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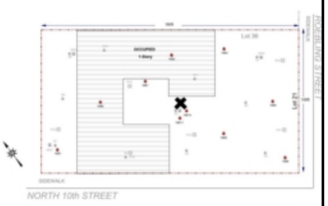
Log of Boring **16B9** Sheet 1 of 1

Project 215 North 10th Street		Project No. 170482201	
Location Brooklyn, New York		Elevation and Datum 8 NAVD88	
Drilling Company AARCO Environmental Services, Inc.		Date Started 11/20/17	Date Finished 11/20/17
Drilling Equipment Geoprobe 6610 DT		Completion Depth 12 ft	Rock Depth NA
Size and Type of Bit 2-inch O.D. Direct Push		Number of Samples	Disturbed 3 / Undisturbed NA / Core NA
Casing Diameter (in) NA	Casing Depth (ft) NA	Water Level (ft.)	First ▽ 7 / Completion ▼ NA / 24 HR. ▼ NA
Casing Hammer NA / Weight (lbs) NA / Drop (in) NA		Drilling Foreman Tim Kelly	
Sampler 2-inch I.D. by 4-foot-long Macrocore		Field Engineer Kim Nagotko	
Sampler Hammer NA / Weight (lbs) NA / Drop (in) NA			

\\LANGAN.COM\DATA\NYC\DATA2\170482201\ENGINEERING DATA\ENVIRONMENTAL\GINTLOGS\215 NORTH 10TH STREET.GPJ ... 1/4/2018 10:01:42 AM ... Report: Log - LANGAN

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.0	R1 (0-6") CONCRETE SLAB	0	R1	MACROCORE	6/48	NA	1.0 1.0	
	+7.4		1-4						
		R2a (0-12") Loose, grey, fine SAND, trace glass, trace fine gravel (moist) [FILL]	4-6	R2	MACROCORE	26/48	NA	0.8 31.0	
	+1.1	R2b (12-26") Loose, black, silty SAND, trace organics, trace fine gravel (wet) ▽	7					52.3 17.9	Petroleum-like odors, black staining
		R3a (0-10") Loose, dark grey, silty SAND, trace fine gravel (wet)	8-11	R3	MACROCORE	20/48	NA	61.5 37.2	Rainbow sheen, petroleum-like odors, black staining
		R3b (10-20") Loose, dark greyish brown, silty SAND (moist)	11					14.6 9.0	1135: Collect 16B9_10-11
	-4.0	End of Boring	12						End of boring at ~12' bgs. Backfilled boring using clean soil cuttings to grade.
			13-20						

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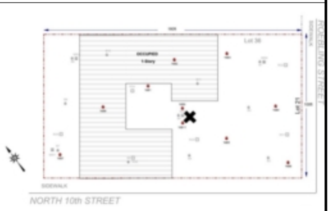
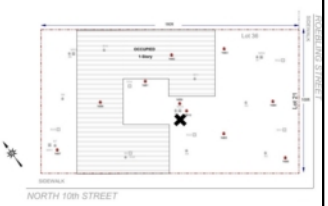
Log of Boring **16B10** Sheet 1 of 1

Project 215 North 10th Street		Project No. 170482201	
Location Brooklyn, New York		Elevation and Datum 8 NAVD88	
Drilling Company AARCO Environmental Services, Inc.		Date Started 11/20/17	Date Finished 11/20/17
Drilling Equipment Geoprobe 6610 DT		Completion Depth 12 ft	Rock Depth NA
Size and Type of Bit 2-inch O.D. Direct Push		Number of Samples: Disturbed 3 / Undisturbed NA / Core NA	
Casing Diameter (in) NA	Casing Depth (ft) NA	Water Level (ft.): First ▽ 7 / Completion ▼ NA / 24 HR. ▼ NA	
Casing Hammer NA / Weight (lbs) NA / Drop (in) NA		Drilling Foreman Tim Kelly	
Sampler 2-inch I.D. by 4-foot-long Macrocore		Field Engineer Kim Nagotko	
Sampler Hammer NA / Weight (lbs) NA / Drop (in) NA			

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data					Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
				Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	
	+8.0		0						
⁘	+7.5	R1a (0-5") CONCRETE SLAB							
▨		R1b (5-18") Loose, dark to light brown, medium SAND, trace fine sand, trace silt, trace coal fragments, trace fine gravel, brick and concrete fragments (dry) [FILL]	1 2 3 4	R1	MACROCORE	18/48	NA	0.1 3.2 2.4	
▨		R2a (0-6") Loose, brown, fine SAND, trace fine gravel, brick and concrete fragments (dry) [FILL] R2b (6-21") Loose, black, fine SAND, some silt, trace organics, trace clay, trace coal fragments (moist) [FILL] ▽ R2c (21-24") Loose, black, fine SAND, some fine gravel, trace organics (moist) [FILL]	5 6 7 8	R2	MACROCORE	24/48	NA	3.6 2.7 28.9 54.6	Petroleum-like odors, black staining 1205: Collect 16B10_7-8
▨		R3a (0-15") Loose, dark grey, silty SAND, trace fine gravel, brick fragments (wet) [FILL]	9	R3	MACROCORE	38/48	NA	9.8 7.8 8.0	
⁖	-2.0	R3b (15-24") Loose, brown, fine SAND, some silt, trace organics, trace fine gravel (moist) R3c (24-36") Loose, black, fine SAND, some fine gravel, trace organics, trace coal fragments (moist)	10 11					6.3 5.8 5.3	
▧	-3.5	R3d (36-38") Soft, grey, CLAY, trace organics (moist)							
	-4.0	End of Boring	12 13 14 15 16 17 18 19 20						End of boring at ~12' bgs. Backfilled boring using clean soil cuttings to grade.

Log of Boring **16B11** Sheet 1 of 1

Project	215 North 10th Street	Project No.	170482201
Location	Brooklyn, New York	Elevation and Datum	8 NAVD88
Drilling Company	AARCO Environmental Services, Inc.	Date Started / Date Finished	11/20/17 / 11/20/17
Drilling Equipment	Geoprobe 6610 DT	Completion Depth / Rock Depth	12 ft / NA
Size and Type of Bit	2-inch O.D. Direct Push	Number of Samples	Disturbed 3 / Undisturbed NA / Core NA
Casing Diameter (in)	NA; Casing Depth (ft) NA	Water Level (ft.)	First ▽ 7 / Completion ▼ NA / 24 HR. ▼ NA
Casing Hammer	NA; Weight (lbs) NA; Drop (in) NA	Drilling Foreman	Tim Kelly
Sampler	2-inch I.D. by 4-foot-long Macrocore	Field Engineer	Kim Nagotko
Sampler Hammer	NA; Weight (lbs) NA; Drop (in) NA		

Elev. (ft)	Sample Description	Depth Scale	Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
+8.0		0						
+7.8	R1a (0-2") CONCRETE SLAB R1b (2-16") Loose, brown, medium SAND, some fine sand, trace fine gravel, trace coal fragments (dry) [FILL]	0–4	R1	MACROCORE	16/48	NA	2.2 5.4	
	R2a (0-12") Loose, dark grey to black, fine SAND, trace organics, trace fine gravel, trace coal fragments (moist) [FILL] ▽	4–8	R2	MACROCORE	23/48	NA	1.0 1.7 0.5 1.8	1310: Collect 16B11_7-8
+1.0	R2b (12-23") Loose, dark grey, fine SAND, some silt, trace fine gravel, imbedded with quater-inch lenses of black fine sand (wet)							
-2.2	R3a (0-12") Loose, dark grey, silty SAND, some fine gravel (moist)	8–12	R3	MACROCORE	15/48	NA	1.5 1.5 1.6	
-3.1	R3b (12-15") Soft, grey, CLAY, trace organics, trace shells (moist)							
-4.0	End of Boring	12						End of boring at ~12' bgs. Backfilled boring using clean soil cuttings to grade.

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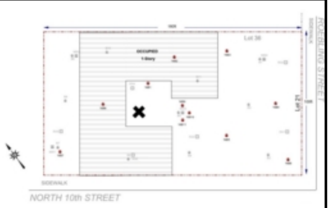
Log of Boring **16B12** Sheet 1 of 1

Project 215 North 10th Street		Project No. 170482201	
Location Brooklyn, New York		Elevation and Datum 8.5 NAVD88	
Drilling Company AARCO Environmental Services, Inc.		Date Started 11/21/17	Date Finished 11/21/17
Drilling Equipment Geoprobe 6610 DT		Completion Depth 15 ft	Rock Depth NA
Size and Type of Bit 2-inch O.D. Direct Push		Number of Samples: Disturbed 3	Undisturbed NA; Core NA
Casing Diameter (in) NA	Casing Depth (ft) NA	Water Level (ft.): First ▽ 7	Completion ▼ NA; 24 HR. ▼ NA
Casing Hammer NA; Weight (lbs) NA	Drop (in) NA	Drilling Foreman Tim Kelly	
Sampler 2-inch I.D. by 4-foot-long Macrocore		Field Engineer Kim Nagotko	
Sampler Hammer NA; Weight (lbs) NA	Drop (in) NA		

MATERIAL SYMBOL	Elev. (ft)	Sample Description	Depth Scale	Sample Data: Number	Type	Recov. (in)	Penetr. resist BL/6in	PID Reading (ppm)	Remarks (Drilling Fluid, Depth of Casing, Fluid Loss, Drilling Resistance, etc.)
	+8.5		0						
	+8.1	R1a (0-4") CONCRETE SLAB R1b (4-20") Loose, black, medium SAND, some fine sand, trace asphalt, trace fine gravel, trace silt, concrete fragments (dry) [FILL] R1c (20-23") Loose, light brown to tan, medium SAND, some fine sand, trace fine gravel (dry) [FILL] R1d (23-36") Loose, dark brown, medium SAND, some fine sand, trace glass, trace ashpalt, brick and concrete fragments (dry) [FILL]	0–4	R1	MACROCORE	36/48	NA	2.0 1.1 0.8 0.8 0.8 0.4	
		R2a (0-12") Loose, dark brown, medium SAND, some fine sand, trace glass, trace fine gravel, brick and concrete fragments (dry) [FILL] R2b (12-36") Loose, black, medium SAND, some fine sand, trace coal fragments, trace silt, trace fine gravel (moist) [FILL] ▽	4–8	R2	MACROCORE	36/48	NA	3.2 2.7 3.1 2.1 1.5 1.1	
	-1.5	R3 (0-24") Loose, black, fine SAND, some silt, trace fine gravel (moist)	8–12	R3	MACROCORE	24/48	NA	1.0 1.2 1.3 1.1	
	-3.5	No Recovery	12–15						
		End of Boring	15–20						End of boring at ~15' bgs. Backfilled boring using clean soil cuttings to grade.

Appendix E

Monitoring Well Construction and Groundwater Sampling Logs

WELL CONSTRUCTION SUMMARY

Well No. 16MW1

PROJECT 215 North 10th Street	**PROJECT NO.** 170482201
LOCATION Brooklyn, New York	**ELEVATION AND DATUM** 8.6 feet NAVD88
DRILLING AGENCY AARCO Environmental Services, Inc.	**DATE STARTED** 11/21/2017 **DATE FINISHED** 11/21/2017
DRILLING EQUIPMENT Geoprobe 6610DT	**DRILLER** Tim Kelly
SIZE AND TYPE OF BIT 2-inch diameter Direct Push	**INSPECTOR** Kim Nagotko

METHOD OF INSTALLATION

AARCO advanced 16MW1 using a Geoprobe 6610 DT to about 15' bgs for installation of the well components. The well consists of a 1-inch diameter pre-pack PVC screened from about 5 to 15' bgs with a PVC riser to grade. No. 2 Morrie sand was backfilled around the screen, followed by a 2-foot bentonite cap and clean soil cuttings to grade. AARCO finished the well with a flush-mount cover and cement patch.

METHOD OF WELL DEVELOPMENT

AARCO used a check valuve to purge groundwater until clear. About 4 gallons of groundwater were purged and placed in a 55-gallon drum for future off-site disposal.

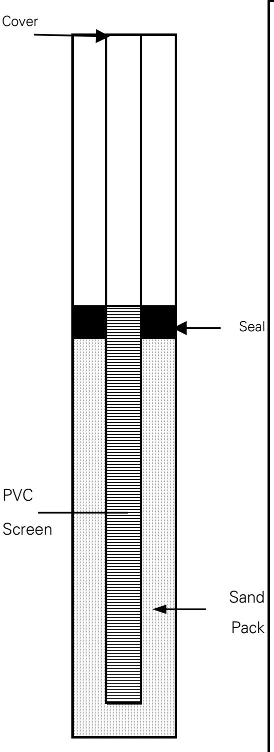
TYPE OF CASING Pre-pack	**DIAMETER** 1	**TYPE OF BACKFILL MATERIAL** Clean soil cuttings
TYPE OF SCREEN Pre-pack	**DIAMETER** 1	**TYPE OF SEAL MATERIAL** Hydrated Bentonite Chips
BOREHOLE DIAMETER	2	**TYPE OF FILTER MATERIAL** Morrie No. 2 Sand

	ELEVATION	DEPTH (ft)
TOP OF CASING	8.0	0.6
TOP OF SEAL	7.6	1
TOP OF FILTER	5.6	3
TOP OF SCREEN	3.6	5
BOTTOM OF BORING	-6.4	15
SCREEN LENGTH		10
SLOT SIZE		0.01

GROUNDWATER ELEVATIONS

ELEVATION	DATE	DEPTH TO WATER
2.01	11/21/2017	6.59
1.62	1/2/2018	6.98

WELL DETAILS



SUMMARY SOIL CLASSIFICATION	DEPTH (FT)
See boring log	
Fill	0 1
Sand	3 5 7 15

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WELL CONSTRUCTION SUMMARY

Well No. 16MW2

PROJECT 215 North 10th Street	**PROJECT NO.** 170482201
LOCATION Brooklyn, New York	**ELEVATION AND DATUM** 8.0 feet NAVD88
DRILLING AGENCY AARCO Environmental Services, Inc.	**DATE STARTED** 11/21/2017 **DATE FINISHED** 11/21/2017
DRILLING EQUIPMENT Geoprobe 6610DT	**DRILLER** Tim Kelly
SIZE AND TYPE OF BIT 2-inch diameter Direct Push	**INSPECTOR** Kim Nagotko

METHOD OF INSTALLATION

AARCO advanced 16MW2 using a Geoprobe 6610 DT to about 15' bgs for installation of the well components. The well consists of a 1-inch diameter pre-pack PVC screened from about 5 to 15' bgs with a PVC riser to grade. No. 2 Morrie sand was backfilled around the screen, followed by a 2-foot bentonite cap and clean soil cuttings to grade. AARCO finished the well with a flush-mount cover and cement patch.

METHOD OF WELL DEVELOPMENT

AARCO used a check valuve to purge groundwater until clear. About 4 gallons of groundwater were purged and placed in a 55-gallon drum for future off-site disposal.

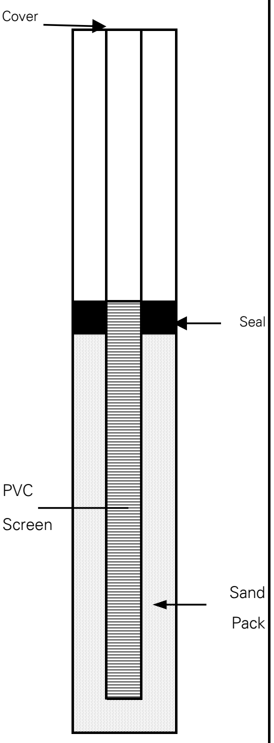
TYPE OF CASING Pre-pack	**DIAMETER** 1	**TYPE OF BACKFILL MATERIAL** Clean Soil Cuttings
TYPE OF SCREEN Pre-pack	**DIAMETER** 1	**TYPE OF SEAL MATERIAL** Hydrated Bentonite Chips
BOREHOLE DIAMETER	2	**TYPE OF FILTER MATERIAL** Morrie No. 2 Sand

	ELEVATION	DEPTH (ft)
TOP OF CASING	7.4	0.6
TOP OF SEAL	7.0	1
TOP OF FILTER	5.0	3
TOP OF SCREEN	3.0	5
BOTTOM OF BORING	-7.0	15
SCREEN LENGTH		10
SLOT SIZE		0.01

GROUNDWATER ELEVATIONS

ELEVATION	DATE	DEPTH TO WATER
1.86	11/21/2017	6.14
1.25	1/2/2018	6.75

WELL DETAILS



SUMMARY SOIL CLASSIFICATION	DEPTH (FT)
See boring log	
	0
Fill	
	1
	3
	5
Sand	10.5
Clay	12
	15

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WELL CONSTRUCTION SUMMARY

Well No. 16MW3

PROJECT 215 North 10th Street	**PROJECT NO.** 170482201
LOCATION Brooklyn, New York	**ELEVATION AND DATUM** 7.7 feet NAVD88
DRILLING AGENCY AARCO Environmental Services, Inc.	**DATE STARTED** 11/21/2017 **DATE FINISHED** 11/21/2017
DRILLING EQUIPMENT Geoprobe 6610DT	**DRILLER** Tim Kelly
SIZE AND TYPE OF BIT 2-inch diameter Direct Push	**INSPECTOR** Kim Nagotko

METHOD OF INSTALLATION

AARCO advanced 16MW3 using a Geoprobe 6610 DT to about 15' bgs for installation of the well components. The well consists of a 1-inch diameter pre-pack PVC screened from about 5 to 15' bgs with a PVC riser to grade. No. 2 Morrie sand was backfilled around the screen, followed by a 2-foot bentonite cap and clean soil cuttings to grade. AARCO finished the well with a flush-mount cover and cement patch.

METHOD OF WELL DEVELOPMENT

AARCO used a check valuve to purge groundwater until clear. About 4 gallons of groundwater were purged and placed in a 55-gallon drum for future off-site disposal.

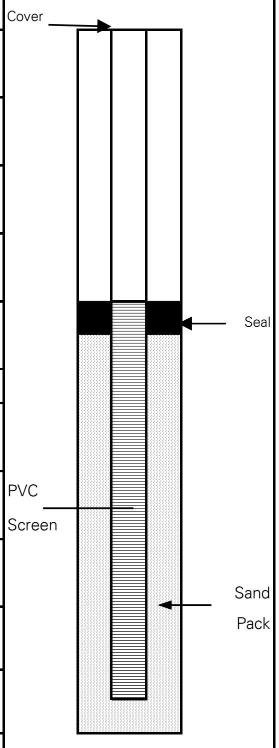
TYPE OF CASING Pre-pack	**DIAMETER** 1	**TYPE OF BACKFILL MATERIAL** Clean soil cuttings
TYPE OF SCREEN Pre-pack	**DIAMETER** 1	**TYPE OF SEAL MATERIAL** Hydrated Bentonite Chips
BOREHOLE DIAMETER	2	**TYPE OF FILTER MATERIAL** Morrie No. 2 Sand

	ELEVATION	**DEPTH (ft)**
TOP OF CASING	7.1	0.6
TOP OF SEAL	6.7	1
TOP OF FILTER	4.7	3
TOP OF SCREEN	2.7	5
BOTTOM OF BORING	-7.3	15
SCREEN LENGTH		10
SLOT SIZE		0.01

GROUNDWATER ELEVATIONS

ELEVATION	DATE	DEPTH TO WATER
1.58	11/21/2017	6.12
1.65	1/2/2018	6.05

WELL DETAILS



SUMMARY SOIL CLASSIFICATION	**DEPTH (FT)**
See boring log	
Fill	0
	1
	3
	5
	15

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GROUND WATER SAMPLE FIELD INFORMATION FORM

Project:	215 North 10th Street	**Site Location:**	Brooklyn, New York	**Well No:**	MW3	**Well Depth:**	13.70
Project Number:	170482201	**Pump Make/Model**	Solinist Peri. Pump	**Well Permit #:**	N/A	**Well Diameter:**	1.00
Personnel:	Kim Nagotko	**Weather:**	40-50, Sunny	**Pump Intake Depth (ft):**	10.00	**Well Screen Interval:**	5 to 15
Water Quality Device Model	Horiba	**Background PID Reading:**	0.0	**Depth to Water Before Pump Installation:**	6.13	**Sample No.:**	MW3_112917
Pine Number	C294688	**PID Beneath Inner Cap:**	0.0	**Tubing Diameter**	1/4-inch	**Sample Date:**	11/29/2017
						Sample Time:	11:25

STABILIZATION = 3 successive readings within limits

TIME	PH su (+/- 0.1)	CONDUCTIVITY uS/cm (+/- 3%)	DO mg/l (+/- 10%) above 0.5 mg/l	ORP mv (+/- 10mV)	TURBIDITY ntu (+/- 10%) above 5 NTU	TEMP deg c (+/- 3%)	DTW ft Drawdown < 0.33 ft	Q (L/min) <0.5 L/min (0.13 gpm)	NOTES color, odor etc.	Cumulative Discharge Volume
10:45	**PRE-PURGE**									
10:55	6.64	0.74	1.73	-37.00	4.60	16.54	6.13	0.5	Petroleum-like odor	
11:00	6.43	0.73	0.86	-40.00	4.70	16.56	6.13	0.5	clear discharge	
11:05	6.34	0.73	0.02	-59.00	4.80	16.78	6.13	0.5		
11:10	6.33	0.72	0.00	-72.00	5.30	16.91	6.13	0.5		
11:15	6.30	0.73	0.00	-87.00	4.80	17.04	6.13	0.5		
11:20	6.28	0.73	0.00	-93.00	4.50	17.09	6.13	0.5		
11:25	6.25	0.73	0.00	-96.00	4.80	17.23	6.13	0.5		~6 gallons

Notes Cont.

Following samples collected:
1125: MW3_112917
1130: GWMS_MW3_112917
1135: GWMSD_MW3_112917

GROUND WATER SAMPLE FIELD INFORMATION FORM

Project:	215 North 10th Street	**Site Location:**	Brooklyn, New York	**Well No:**	MW4	**Well Depth:**	12.16
Project Number:	170482201	**Pump Make/Model**	Solinist Peri. Pump	**Well Permit #:**	N/A	**Well Diameter:**	1.00
Personnel:	Kim Nagotko	**Weather:**	40-50, Sunny	**Pump Intake Depth (ft):**	10.00	**Well Screen Interval:**	5 to 15
Water Quality Device Model	Horiba	**Background PID Reading:**	0.0	**Depth to Water Before Pump Installation:**	6.66	**Sample No.:**	MW4_112917
Pine Number	C294688	**PID Beneath Inner Cap:**	0.0	**Tubing Diameter**	1/4-inch	**Sample Date:**	11/29/2017
						Sample Time:	16:45

STABILIZATION = 3 successive readings within limits

TIME	PH su (+/- 0.1)	CONDUCTIVITY uS/cm (+/- 3%)	DO mg/l (+/- 10%) above 0.5 mg/l	ORP mv (+/- 10mV)	TURBIDITY ntu (+/- 10%) above 5 NTU	TEMP deg c (+/- 3%)	DTW ft Drawdown < 0.33 ft	Q (L/min) <0.5 L/min (0.13 gpm)	NOTES color, odor etc.	Cumulative Discharge Volume
15:35	**PRE-PURGE**									
15:40	6.36	1.36	5.11	-109.00	264.00	15.55	6.66	0.4	brown	
15:45	6.38	1.14	5.73	-100.00	968.00	16.05	6.66	0.4		
15:50	6.21	1.07	7.41	-86.00	1000.00	16.09	6.66	0.4		
15:55	6.23	1.11	9.42	-83.00	1000.00	16.00	6.66	0.4		
16:00	6.26	1.11	9.55	-80.00	1000.00	15.94	6.66	0.4		
16:05	6.27	1.13	9.74	-78.00	946.00	15.87	6.66	0.4		
16:10	6.27	1.13	9.90	-76.00	814.00	15.79	6.66	0.4		
16:15	6.26	1.10	9.90	-74.00	341.00	15.75	6.66	0.4		
16:20	6.27	1.15	9.95	-74.00	335.00	15.73	6.66	0.4		
16:25	6.27	1.13	9.95	-73.00	157.00	15.70	6.66	0.4		
16:30	6.28	1.13	9.95	-71.00	86.30	15.72	6.66	0.4		
16:35	6.29	1.12	9.97	-70.00	43.20	15.73	6.66	0.4		
16:40	6.28	1.14	9.99	-70.00	27.10	15.72	6.66	0.4		~5 gallons

GROUND WATER SAMPLE FIELD INFORMATION FORM

Project:	215 North 10th Street	**Site Location:**	Brooklyn, New York	**Well No:**	16mw1	**Well Depth:**	15.00
Project Number:	170482201	**Pump Make/Model**	Solinist Peri. Pump	**Well Permit #:**	N/A	**Well Diameter:**	1.00
Personnel:	Kim Nagotko	**Weather:**	40-50, Sunny	**Pump Intake Depth (ft):**	10.00	**Well Screen Interval:**	5 to 15
Water Quality Device Model	Horiba	**Background PID Reading:**	0.0	**Depth to Water Before Pump Installation:**	6.82	**Sample No.:**	16MW1_112917
Pine Number	C294688	**PID Beneath Inner Cap:**	0.7	**Tubing Diameter**	1/4-inch	**Sample Date:**	11/29/2017
						Sample Time:	15:35

STABILIZATION = 3 successive readings within limits

TIME	**PH su (+/- 0.1)**	**CONDUCTIVITY uS/cm (+/- 3%)**	**DO mg/l (+/- 10%) above 0.5 mg/l**	**ORP mv (+/- 10mV)**	**TURBIDITY ntu (+/- 10%) above 5 NTU**	**TEMP deg c (+/- 3%)**	**DTW ft Drawdown < 0.33 ft**	**Q (L/min) <0.5 L/min (0.13 gpm)**	**NOTES color, odor etc.**	**Cumulative Discharge Volume**
14:40	**PRE-PURGE**									
14:45	6.10	0.64	9.50	-99.00	1000.00	15.12	6.82	0.4	light grey to clear	
14:50	6.13	2.26	0.00	-81.00	1000.00	15.64	6.82	0.4		
14:55	6.23	1.83	0.00	-85.00	274.00	15.91	6.82	0.4		
15:00	6.26	1.67	0.00	-88.00	92.30	15.95	6.82	0.4		
15:05	6.27	1.63	0.00	-91.00	42.90	15.96	6.82	0.4		
15:10	6.27	1.60	0.00	-93.00	22.50	15.97	6.82	0.4		
15:15	6.28	1.58	0.00	-96.00	11.00	15.97	6.82	0.4		
15:20	6.28	1.57	0.00	-99.00	7.20	15.95	6.82	0.4		
15:25	6.29	1.56	0.00	-100.00	4.50	15.91	6.82	0.4		
15:30	6.29	1.56	0.00	-102.00	4.30	15.90	6.82	0.4		
15:35	6.29	1.56	0.00	-103.00	2.30	15.90	6.82	0.4		~ 6 gallons

GROUND WATER SAMPLE FIELD INFORMATION FORM

Project:	215 North 10th Street	**Site Location:**	Brooklyn, New York	**Well No:**	16MW2	**Well Depth:**	15.00
Project Number:	170482201	**Pump Make/Model**	Solinist Peri. Pump	**Well Permit #:**	N/A	**Well Diameter:**	1.00
Personnel:	Kim Nagotko	**Weather:**	40-50, Sunny	**Pump Intake Depth (ft):**	10.00	**Well Screen Interval:**	5 to 15
Water Quality Device Model	Horiba	**Background PID Reading:**	0.0	**Depth to Water Before Pump Installation:**	6.35	**Sample No.:**	16MW2_112917
Pine Number	C294688	**PID Beneath Inner Cap:**	4.8	**Tubing Diameter**	1/4-inch	**Sample Date:**	11/29/2017
						Sample Time:	14:30

STABILIZATION = 3 successive readings within limits

TIME	PH su (+/- 0.1)	CONDUCTIVITY uS/cm (+/- 3%)	DO mg/l (+/- 10%) above 0.5 mg/l	ORP mv (+/- 10mV)	TURBIDITY ntu (+/- 10%) above 5 NTU	TEMP deg c (+/- 3%)	DTW ft Drawdown < 0.33 ft	Q (L/min) <0.5 L/min (0.13 gpm)	NOTES color, odor etc.	Cumulative Discharge Volume
13:10	**PRE-PURGE**									
13:15	5.35	4.22	2.22	-33.00	92.30	15.54	6.35	0.4	clear to light grey	
13:20	6.02	1.89	2.03	-64.00	65.20	15.64	6.35	0.4		
13:25	6.04	1.89	2.03	-67.00	55.60	15.70	6.35	0.4		
13:30	6.05	1.97	1.98	-70.00	56.80	15.79	6.35	0.4		
13:35	Purging haulted due to site access issues with CPT rig.									
13:40	6.06	3.47	7.80	-58.00	1000.00	15.51	6.35	0.4		
13:45	6.09	2.97	6.61	-78.00	1000.00	15.68	6.35	0.4		
13:50	6.20	1.80	8.11	-78.00	1000.00	15.68	6.35	0.4		
13:55	6.19	1.78	7.81	-78.00	346.00	15.73	6.35	0.4		
14:00	6.21	1.76	7.33	-79.00	222.00	15.72	6.35	0.4		
14:05	6.21	1.75	6.94	-80.00	113.00	15.76	6.35	0.4		
14:10	6.21	1.76	6.86	-80.00	73.20	15.75	6.35	0.4		
14:15	6.22	1.75	6.84	-79.00	44.60	15.75	6.35	0.4		
14:20	6.20	1.73	5.83	-80.00	22.20	15.75	6.35	0.4		
14:25	6.20	1.74	5.87	-80.00	15.90	15.75	6.35	0.4		
14:30	6.21	1.74	5.55	-80.00	8.70	15.75	6.35	0.4		~6 gallons
									Notes Cont.:	
									Following samples collected;	
									1430: 16MW2_112917	
									GWDUP01_112917	

GROUND WATER SAMPLE FIELD INFORMATION FORM

Project:	215 North 10th Street	**Site Location:**	Brooklyn, New York	**Well No:**	16MW3	**Well Depth:**	15.00
Project Number:	170482201	**Pump Make/Model**	Solinist Peri. Pump	**Well Permit #:**	N/A	**Well Diameter:**	1.00
Personnel:	Kim Nagotko	**Weather:**	40-50, Sunny	**Pump Intake Depth (ft):**	10.00	**Well Screen Interval:**	5 to 15
Water Quality Device Model	Horiba	**Background PID Reading:**	0.0	**Depth to Water Before Pump Installation:**	5.88	**Sample No.:**	16MW3_112917
Pine Number	C294688	**PID Beneath Inner Cap:**	0.1	**Tubing Diameter**	1/4-inch	**Sample Date:**	11/29/2017
						Sample Time:	13:05

STABILIZATION = 3 successive readings within limits

TIME	PH su (+/- 0.1)	CONDUCTIVITY uS/cm (+/- 3%)	DO mg/l (+/- 10%) above 0.5 mg/l	ORP mv (+/- 10mV)	TURBIDITY ntu (+/- 10%) above 5 NTU	TEMP deg c (+/- 3%)	DTW ft Drawdown < 0.33 ft	Q (L/min) <0.5 L/min (0.13 gpm)	NOTES color, odor etc.	Cumulative Discharge Volume
12:00	**PRE-PURGE**									
12:05	6.05	2.13	4.99	-83.00	304.00	16.72	5.88	0.5	clear	
12:10	6.18	1.17	0.63	-70.00	130.00	16.55	5.88	0.5		
12:15	6.09	1.06	0.00	-59.00	69.70	16.34	5.88	0.5		
12:20	6.02	1.06	0.00	-53.00	40.40	16.34	5.88	0.5		
12:25	5.96	1.96	0.00	-48.00	57.30	16.43	5.88	0.5		
12:30	5.91	1.05	0.00	-44.00	62.10	16.29	5.88	0.5		
12:35	5.88	1.05	0.00	-41.00	37.80	16.11	5.88	0.5		
12:40	5.86	1.05	0.00	-40.00	38.30	16.04	5.88	0.5		
12:45	5.84	1.07	0.00	-38.00	34.00	15.98	5.88	0.5		
12:50	5.82	1.06	0.00	-36.00	32.30	15.94	5.88	0.5		
12:55	5.82	1.08	0.00	-36.00	27.90	15.89	5.88	0.5		
13:00	5.82	1.08	0.00	-35.00	26.70	15.87	5.88	0.5		
13:05	5.82	1.08	0.00	-35.00	25.40	15.86	5.88	0.5		~ 6.5 gallons

Appendix F

Community Air Monitoring Program Summary Data

LANGAN

215 North 10th Street
170482201
CAMP Data Summary

Date: 11/20/2017
Observer: Kim Nagotko

Particulate Monitoring		
	Upwind	**Downwind**
Minimum 15min Average	0.006	0.008
Maximum 15min Average	0.012	0.021
High Intervals "exceedances"	N/A	0
Minimum 1min Reading	0.005	0.007
Maximum 1min Reading	0.014	0.036

Organic Vapor Monitoring		
	Upwind	**Downwind**
Minimum 15min Average	0.0	0.0
Maximum 15min Average	0.3	0.0
High Intervals "exceedances"	N/A	0.0
Minimum 1min Reading	0.0	0.0
Maximum 1min Reading	0.7	0.0

All reported particulate concentrations are in mg/m3 or milligrams per cubic meter and all reported organic vapor concentrations are in ppm or parts per million, unless specified otherwise.

Monday, November 20, 2017						
Number of Instances Where Downwind Particulates Exceeds Upwind Particulate + .150 mg/m^3 =						0
Number of Comparable Data Points =						347
PARTICULATE DATA						
Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
8:32	0.012		8:32			
8:33	0.011		8:33			
8:34	0.011		8:34			
8:35	0.010		8:35			
8:36	0.010		8:36			
8:37	0.010		8:37			
8:38	0.014		8:38			
8:39	0.010		8:39			
8:40	0.010		8:40	0.016		
8:41	0.011		8:41	0.014		
8:42	0.011		8:42	0.014		
8:43	0.011		8:43	0.015		
8:44	0.011		8:44	0.014		
8:45	0.011		8:45	0.014		
8:46	0.011		8:46	0.017	0.015	
8:47	0.012		8:47	0.015	0.015	
8:48	0.011		8:48	0.016	0.015	
8:49	0.011		8:49	0.016	0.015	
8:50	0.011	0.011	8:50	0.017	0.015	-
8:51	0.012	0.011	8:51	0.017	0.015	-
8:52	0.011	0.011	8:52	0.017	0.016	-
8:53	0.011	0.011	8:53	0.018	0.016	-
8:54	0.012	0.011	8:54	0.016	0.016	-
8:55	0.012	0.011	8:55	0.018	0.016	-
8:56	0.011	0.011	8:56	0.020	0.016	-
8:57	0.012	0.011	8:57	0.023	0.017	-
8:58	0.012	0.011	8:58	0.017	0.017	-
8:59	0.012	0.011	8:59	0.016	0.017	-
9:00	0.011	0.011	9:00	0.017	0.017	-
9:01	0.012	0.012	9:01	0.017	0.017	-
9:02	0.012	0.012	9:02	0.018	0.018	-
9:03	0.011	0.012	9:03	0.023	0.018	-
9:04	0.011	0.012	9:04	0.036	0.019	-
9:05	0.011	0.012	9:05	0.029	0.020	-
9:06	0.012	0.012	9:06	0.020	0.020	-
9:07	0.012	0.012	9:07	0.019	0.020	-
9:08	0.013	0.012	9:08	0.019	0.021	-
9:09	0.013	0.012	9:09	0.018	0.021	-
9:10	0.013	0.012	9:10	0.017	0.021	-
9:11	0.013	0.012	9:11	0.017	0.020	-
9:12	0.013	0.012	9:12	0.016	0.020	-
9:13	0.012	0.012	9:13	0.014	0.020	-
9:14	0.013	0.012	9:14	0.013	0.020	-
9:15	0.013	0.012	9:15	0.014	0.019	-
9:16	0.013	0.012	9:16	0.014	0.019	-
9:17	0.012	0.012	9:17	0.014	0.019	-
9:18	0.010	0.012	9:18	0.015	0.018	-
9:19	0.010	0.012	9:19	0.014	0.017	-
9:20	0.011	0.012	9:20	0.014	0.016	-
9:21	0.012	0.012	9:21	0.014	0.015	-
9:22	0.012	0.012	9:22	0.013	0.015	-
9:23	0.012	0.012	9:23	0.014	0.015	-
9:24	0.011	0.012	9:24	0.014	0.014	-
9:25	0.011	0.012	9:25	0.014	0.014	-
9:26	0.011	0.012	9:26	0.014	0.014	-
9:27	0.011	0.012	9:27	0.014	0.014	-
9:28	0.011	0.012	9:28	0.014	0.014	-
9:29	0.012	0.011	9:29	0.015	0.014	-
9:30	0.012	0.011	9:30	0.015	0.014	-
9:31	0.012	0.011	9:31	0.014	0.014	-
9:32	0.012	0.011	9:32	0.014	0.014	-
9:33	0.012	0.011	9:33	0.015	0.014	-

PARTICULATE DATA						
Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
9:34	0.012	0.012	9:34	0.016	0.014	-
9:35	0.012	0.012	9:35	0.015	0.014	-
9:36	0.013	0.012	9:36	0.016	0.014	-
9:37	0.012	0.012	9:37	0.015	0.015	-
9:38	0.012	0.012	9:38	0.015	0.015	-
9:39	0.013	0.012	9:39	0.016	0.015	-
9:40	0.013	0.012	9:40	0.015	0.015	-
9:41	0.013	0.012	9:41	0.015	0.015	-
9:42	0.012	0.012	9:42	0.015	0.015	-
9:43	0.013	0.012	9:43	0.014	0.015	-
9:44	0.012	0.012	9:44	0.012	0.015	-
9:45	0.012	0.012	9:45	0.012	0.015	-
9:46	0.012	0.012	9:46	0.013	0.015	-
9:47	0.011	0.012	9:47	0.013	0.014	-
9:48	0.011	0.012	9:48	0.013	0.014	-
9:49	0.010	0.012	9:49	0.013	0.014	-
9:50	0.011	0.012	9:50	0.013	0.014	-
9:51	0.011	0.012	9:51	0.013	0.014	-
9:52	0.012	0.012	9:52	0.012	0.014	-
9:53	0.012	0.012	9:53	0.012	0.013	-
9:54	0.012	0.012	9:54	0.011	0.013	-
9:55	0.012	0.012	9:55	0.010	0.013	-
9:56	0.012	0.012	9:56	0.010	0.012	-
9:57	0.011	0.012	9:57	0.010	0.012	-
9:58	0.011	0.011	9:58	0.011	0.012	-
9:59	0.010	0.011	9:59	0.012	0.012	-
10:00	0.010	0.011	10:00	0.012	0.012	-
10:01	0.010	0.011	10:01	0.013	0.012	-
10:02	0.011	0.011	10:02	0.011	0.012	-
10:03	0.011	0.011	10:03	0.011	0.012	-
10:04	0.011	0.011	10:04	0.012	0.012	-
10:05	0.010	0.011	10:05	0.014	0.012	-
10:06	0.010	0.011	10:06	0.012	0.012	-
10:07	0.011	0.011	10:07	0.012	0.012	-
10:08	0.010	0.011	10:08	0.011	0.011	-
10:09	0.010	0.011	10:09	0.011	0.011	-
10:10	0.009	0.010	10:10	0.011	0.012	-
10:11	0.009	0.010	10:11	0.011	0.012	-
10:12	0.009	0.010	10:12	0.012	0.012	-
10:13	0.009	0.010	10:13	0.013	0.012	-
10:14	0.009	0.010	10:14	0.013	0.012	-
10:15	0.009	0.010	10:15	0.013	0.012	-
10:16	0.009	0.010	10:16	0.012	0.012	-
10:17	0.009	0.010	10:17	0.011	0.012	-
10:18	0.009	0.010	10:18	0.012	0.012	-
10:19	0.009	0.009	10:19	0.010	0.012	-
10:20	0.009	0.009	10:20	0.010	0.012	-
10:21	0.009	0.009	10:21	0.010	0.011	-
10:22	0.009	0.009	10:22	0.010	0.011	-
10:23	0.009	0.009	10:23	0.011	0.011	-
10:24	0.008	0.009	10:24	0.010	0.011	-
10:25	0.008	0.009	10:25	0.009	0.011	-
10:26	0.008	0.009	10:26	0.010	0.011	-
10:27	0.008	0.009	10:27	0.010	0.011	-
10:28	0.008	0.009	10:28	0.009	0.011	-
10:29	0.008	0.009	10:29	0.009	0.010	-
10:30	0.008	0.009	10:30	0.010	0.010	-
10:31	0.008	0.008	10:31	0.009	0.010	-
10:32	0.008	0.008	10:32	0.010	0.010	-
10:33	0.008	0.008	10:33	0.011	0.010	-
10:34	0.008	0.008	10:34	0.011	0.010	-
10:35	0.009	0.008	10:35	0.010	0.010	-
10:36	0.009	0.008	10:36	0.009	0.010	-
10:37	0.009	0.008	10:37	0.009	0.010	-
10:38	0.010	0.008	10:38	0.010	0.010	-

PARTICULATE DATA						
Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
10:39	0.009	0.008	10:39	0.010	0.010	-
10:40	0.008	0.008	10:40	0.010	0.010	-
10:41	0.008	0.008	10:41	0.010	0.010	-
10:42	0.009	0.008	10:42	0.011	0.010	-
10:43	0.009	0.009	10:43	0.010	0.010	-
10:44	0.009	0.009	10:44	0.010	0.010	-
10:45	0.010	0.009	10:45	0.010	0.010	-
10:46	0.010	0.009	10:46	0.011	0.010	-
10:47	0.010	0.009	10:47	0.011	0.010	-
10:48	0.009	0.009	10:48	0.010	0.010	-
10:49	0.009	0.009	10:49	0.010	0.010	-
10:50	0.009	0.009	10:50	0.010	0.010	-
10:51	0.009	0.009	10:51	0.011	0.010	-
10:52	0.009	0.009	10:52	0.010	0.010	-
10:53	0.009	0.009	10:53	0.010	0.010	-
10:54	0.009	0.009	10:54	0.010	0.010	-
10:55	0.010	0.009	10:55	0.010	0.010	-
10:56	0.009	0.009	10:56	0.010	0.010	-
10:57	0.009	0.009	10:57	0.013	0.010	-
10:58	0.009	0.009	10:58	0.012	0.011	-
10:59	0.009	0.009	10:59	0.011	0.011	-
11:00	0.009	0.009	11:00	0.012	0.011	-
11:01	0.009	0.009	11:01	0.014	0.011	-
11:02	0.010	0.009	11:02	0.012	0.011	-
11:03	0.010	0.009	11:03	0.012	0.011	-
11:04	0.010	0.009	11:04	0.012	0.011	-
11:05	0.009	0.009	11:05	0.011	0.011	-
11:06	0.009	0.009	11:06	0.012	0.011	-
11:07	0.008	0.009	11:07	0.012	0.012	-
11:08	0.009	0.009	11:08	0.011	0.012	-
11:09	0.009	0.009	11:09	0.011	0.012	-
11:10	0.010	0.009	11:10	0.011	0.012	-
11:11	0.010	0.009	11:11	0.013	0.012	-
11:12	0.010	0.009	11:12	0.013	0.012	-
11:13	0.009	0.009	11:13	0.011	0.012	-
11:14	0.009	0.009	11:14	0.011	0.012	-
11:15	0.010	0.009	11:15	0.011	0.012	-
11:16	0.010	0.009	11:16	0.010	0.012	-
11:17	0.011	0.010	11:17	0.010	0.011	-
11:18	0.009	0.009	11:18	0.010	0.011	-
11:19	0.010	0.009	11:19	0.013	0.011	-
11:20	0.008	0.009	11:20	0.012	0.011	-
11:21	0.008	0.009	11:21	0.013	0.011	-
11:22	0.009	0.009	11:22	0.013	0.012	-
11:23	0.008	0.009	11:23	0.012	0.012	-
11:24	0.009	0.009	11:24	0.012	0.012	-
11:25	0.009	0.009	11:25	0.012	0.012	-
11:26	0.008	0.009	11:26	0.010	0.012	-
11:27	0.008	0.009	11:27	0.012	0.011	-
11:28	0.007	0.009	11:28	0.011	0.011	-
11:29	0.008	0.009	11:29	0.010	0.011	-
11:30	0.007	0.009	11:30	0.013	0.012	-
11:31	0.007	0.008	11:31	0.012	0.012	-
11:32	0.007	0.008	11:32	0.010	0.012	-
11:33	0.008	0.008	11:33	0.010	0.012	-
11:34	0.007	0.008	11:34	0.010	0.011	-
11:35	0.007	0.008	11:35	0.014	0.012	-
11:36	0.007	0.008	11:36	0.013	0.012	-
11:37	0.006	0.008	11:37	0.014	0.012	-
11:38	0.007	0.007	11:38	0.013	0.012	-
11:39	0.007	0.007	11:39	0.012	0.012	-
11:40	0.007	0.007	11:40	0.013	0.012	-
11:41	0.006	0.007	11:41	0.011	0.012	-
11:42	0.007	0.007	11:42	0.012	0.012	-
11:43	0.007	0.007	11:43	0.011	0.012	-

PARTICULATE DATA						
Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
11:44	0.007	0.007	11:44	0.012	0.012	-
11:45	0.006	0.007	11:45	0.012	0.012	-
11:46	0.006	0.007	11:46	0.011	0.012	-
11:47	0.006	0.007	11:47	0.013	0.012	-
11:48	0.006	0.007	11:48	0.013	0.012	-
11:49	0.006	0.007	11:49	0.011	0.012	-
11:50	0.006	0.006	11:50	0.010	0.012	-
11:51	0.007	0.006	11:51	0.010	0.012	-
11:52	0.007	0.007	11:52	0.010	0.012	-
11:53	0.007	0.007	11:53	0.010	0.011	-
11:54	0.006	0.006	11:54	0.010	0.011	-
11:55	0.006	0.006	11:55	0.012	0.011	-
11:56	0.006	0.006	11:56	0.011	0.011	-
11:57	0.006	0.006	11:57	0.010	0.011	-
11:58	0.008	0.006	11:58	0.009	0.011	-
11:59	0.007	0.006	11:59	0.010	0.011	-
12:00	0.007	0.006	12:00	0.011	0.011	-
12:01	0.007	0.007	12:01	0.010	0.011	-
12:02	0.006	0.007	12:02	0.009	0.010	-
12:03	0.006	0.007	12:03	0.010	0.010	-
12:04	0.007	0.007	12:04	0.010	0.010	-
12:05	0.007	0.007	12:05	0.009	0.010	-
12:06	0.007	0.007	12:06	0.010	0.010	-
12:07	0.006	0.007	12:07	0.010	0.010	-
12:08	0.006	0.007	12:08	0.010	0.010	-
12:09	0.007	0.007	12:09	0.010	0.010	-
12:10	0.007	0.007	12:10	0.009	0.010	-
12:11	0.007	0.007	12:11	0.010	0.010	-
12:12	0.006	0.007	12:12	0.010	0.010	-
12:13	0.006	0.007	12:13	0.009	0.010	-
12:14	0.006	0.007	12:14	0.012	0.010	-
12:15	0.006	0.006	12:15	0.010	0.010	-
12:16	0.006	0.006	12:16	0.009	0.010	-
12:17	0.006	0.006	12:17	0.011	0.010	-
12:18	0.007	0.006	12:18	0.011	0.010	-
12:19	0.008	0.007	12:19	0.010	0.010	-
12:20	0.006	0.006	12:20	0.010	0.010	-
12:21	0.007	0.006	12:21	0.011	0.010	-
12:22	0.007	0.007	12:22	0.009	0.010	-
12:23	0.007	0.007	12:23	0.009	0.010	-
12:24	0.007	0.007	12:24	0.009	0.010	-
12:25	0.006	0.007	12:25	0.010	0.010	-
12:26	0.006	0.006	12:26	0.009	0.010	-
12:27	0.005	0.006	12:27	0.009	0.010	-
12:28	0.005	0.006	12:28	0.009	0.010	-
12:29	0.005	0.006	12:29	0.009	0.010	-
12:30	0.005	0.006	12:30	0.010	0.010	-
12:31	0.006	0.006	12:31	0.009	0.010	-
12:32	0.005	0.006	12:32	0.010	0.010	-
12:33	0.006	0.006	12:33	0.008	0.009	-
12:34	0.006	0.006	12:34	0.009	0.009	-
12:35	0.006	0.006	12:35	0.009	0.009	-
12:36	0.006	0.006	12:36	0.009	0.009	-
12:37	0.005	0.006	12:37	0.011	0.009	-
12:38	0.006	0.006	12:38	0.010	0.009	-
12:39	0.006	0.006	12:39	0.009	0.009	-
12:40	0.006	0.006	12:40	0.009	0.009	-
12:41	0.008	0.006	12:41	0.010	0.009	-
12:42	0.007	0.006	12:42	0.010	0.009	-
12:43	0.006	0.006	12:43	0.011	0.010	-
12:44	0.007	0.006	12:44	0.011	0.010	-
12:45	0.007	0.006	12:45	0.012	0.010	-
12:46	0.007	0.006	12:46	0.009	0.010	-
12:47	0.008	0.006	12:47	0.010	0.010	-
12:48	0.007	0.007	12:48	0.011	0.010	-

PARTICULATE DATA						
Upwind			**Downwind**			**Exceeds Particulate Alarm Limits**
Time	**PM 10 (mg/m^3)**	**15-Minute Average**	**Time**	**PM 10 (mg/m^3)**	**15-Minute Average**	
12:49	0.008	0.007	12:49	0.010	0.010	-
12:50	0.007	0.007	12:50	0.010	0.010	-
12:51	0.007	0.007	12:51	0.011	0.010	-
12:52	0.008	0.007	12:52	0.010	0.010	-
12:53	0.008	0.007	12:53	0.008	0.010	-
12:54	0.008	0.007	12:54	0.008	0.010	-
12:55	0.008	0.007	12:55	0.008	0.010	-
12:56	0.007	0.007	12:56	0.008	0.010	-
12:57	0.007	0.007	12:57	0.008	0.010	-
12:58	0.006	0.007	12:58	0.007	0.009	-
12:59	0.006	0.007	12:59	0.008	0.009	-
13:00	0.006	0.007	13:00	0.008	0.009	-
13:01	0.006	0.007	13:01	0.008	0.009	-
13:02	0.006	0.007	13:02	0.008	0.009	-
13:03	0.006	0.007	13:03	0.009	0.009	-
13:04	0.006	0.007	13:04	0.010	0.009	-
13:05	0.005	0.007	13:05	0.009	0.009	-
13:06	0.005	0.007	13:06	0.009	0.008	-
13:07	0.005	0.006	13:07	0.010	0.008	-
13:08	0.007	0.006	13:08	0.010	0.009	-
13:09	0.006	0.006	13:09	0.011	0.009	-
13:10	0.006	0.006	13:10	0.009	0.009	-
13:11	0.006	0.006	13:11	0.008	0.009	-
13:12	0.007	0.006	13:12	0.009	0.009	-
13:13	0.007	0.006	13:13	0.008	0.009	-
13:14	0.006	0.006	13:14	0.008	0.009	-
13:15	0.005	0.006	13:15	0.008	0.009	-
13:16	0.005	0.006	13:16	0.009	0.009	-
13:17	0.005	0.006	13:17	0.009	0.009	-
13:18	0.005	0.006	13:18	0.009	0.009	-
13:19	0.005	0.006	13:19	0.010	0.009	-
13:20	0.005	0.006	13:20	0.010	0.009	-
13:21	0.005	0.006	13:21	0.010	0.009	-
13:22	0.005	0.006	13:22	0.011	0.009	-
13:23	0.005	0.006	13:23	0.012	0.009	-
13:24	0.006	0.006	13:24	0.011	0.009	-
13:25	0.006	0.006	13:25	0.010	0.009	-
13:26	0.007	0.006	13:26	0.010	0.010	-
13:27	0.008	0.006	13:27	0.010	0.010	-
13:28	0.007	0.006	13:28	0.012	0.010	-
13:29	0.007	0.006	13:29	0.013	0.010	-
13:30	0.006	0.006	13:30	0.012	0.011	-
13:31	0.006	0.006	13:31	0.011	0.011	-
13:32	0.008	0.006	13:32	0.011	0.011	-
13:33	0.010	0.006	13:33	0.011	0.011	-
13:34	0.009	0.007	13:34	0.011	0.011	-
13:35	0.008	0.007	13:35	0.011	0.011	-
13:36	0.007	0.007	13:36	0.012	0.011	-
13:37	0.007	0.007	13:37	0.014	0.011	-
13:38	0.006	0.007	13:38	0.012	0.011	-
13:39	0.007	0.007	13:39	0.012	0.011	-
13:40	0.008	0.007	13:40	0.013	0.012	-
13:41	0.007	0.007	13:41	0.011	0.012	-
13:42	0.009	0.007	13:42	0.011	0.012	-
13:43	0.008	0.008	13:43	0.010	0.012	-
13:44	0.007	0.008	13:44	0.010	0.011	-
13:45	0.007	0.008	13:45	0.009	0.011	-
13:46	0.007	0.008	13:46	0.010	0.011	-
13:47	0.006	0.008	13:47	0.010	0.011	-
13:48	0.005	0.007	13:48	0.010	0.011	-
13:49	0.007	0.007	13:49	0.010	0.011	-
13:50	0.006	0.007	13:50	0.010	0.011	-
13:51	0.006	0.007	13:51	0.010	0.011	-
13:52	0.007	0.007	13:52	0.011	0.011	-
13:53	0.006	0.007	13:53	0.011	0.011	-

PARTICULATE DATA

Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
13:54	0.006	0.007	13:54	0.010	0.010	-
13:55	0.005	0.007	13:55	0.011	0.010	-
13:56	0.006	0.007	13:56	0.010	0.010	-
13:57	0.008	0.006	13:57	0.011	0.010	-
13:58	0.006	0.006	13:58	0.011	0.010	-
13:59	0.006	0.006	13:59	0.014	0.011	-
14:00	0.006	0.006	14:00	0.012	0.011	-
14:01	0.009	0.006	14:01	0.012	0.011	-
14:02	0.014	0.007	14:02	0.013	0.011	-
14:03	0.007	0.007	14:03	0.012	0.011	-
14:04	0.007	0.007	14:04	0.012	0.011	-
14:05	0.007	0.007	14:05	0.011	0.011	-
14:06	0.007	0.007	14:06	0.012	0.012	-
14:07	0.008	0.007	14:07	0.011	0.012	-
14:08	0.007	0.007	14:08	0.011	0.012	-
14:09	0.008	0.007	14:09	0.011	0.012	-
14:10	0.009	0.008	14:10	0.011	0.012	-
14:11	0.010	0.008	14:11	0.011	0.012	-
14:12	0.009	0.008	14:12	0.011	0.012	-
14:13	0.010	0.008	14:13	0.011	0.012	-
14:14	0.007	0.008	14:14	0.011	0.011	-
14:15	0.007	0.008	14:15	0.012	0.011	-
14:16	0.006	0.008	14:16	0.012	0.011	-
14:17	0.006	0.008	14:17	0.012	0.011	-
14:18	0.007	0.008	14:18	0.012	0.011	-
14:19	0.008	0.008	14:19	0.012	0.011	-
14:20	0.009	0.008	14:20	0.010	0.011	-
14:21	0.009	0.008	14:21	0.010	0.011	-
14:22	0.008	0.008	14:22	0.010	0.011	-
14:23	0.008	0.008	14:23	0.010	0.011	-
14:24	0.008	0.008	14:24	0.010	0.011	-
14:25	0.008	0.008	14:25	0.010	0.011	-
14:26	0.010	0.008	14:26	0.010	0.011	-
14:27	0.007	0.008	14:27	0.010	0.011	-
14:28	0.007	0.008	14:28	0.011	0.011	-
14:29	0.007	0.008	14:29	0.013	0.011	-
14:30	0.007	0.008	14:30	0.012	0.011	-
14:31	0.008	0.008	14:31	0.009	0.011	-
14:32	0.008	0.008	14:32	0.011	0.011	-
14:33	0.008	0.008	14:33	0.009	0.010	-
14:34	0.010	0.008	14:34	0.009	0.010	-
14:35	0.007	0.008	14:35	0.010	0.010	-
14:36	0.007	0.008	14:36	0.009	0.010	-
14:37	0.007	0.008	14:37			

Monday, November 20, 2017						
Number of Instances Where Downwind VOCs Exceeds Upwind VOCs + 5ppm =						0
Number of Comparable Data Points =						299
PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
8:49	0.0		8:49			
8:50	0.0		8:50			
8:51	0.1		8:51			
8:52	0.3		8:52			
8:53	0.4		8:53			
8:54	0.3		8:54			
8:55	0.2		8:55			
8:56	0.1		8:56			
8:57	0.1		8:57			
8:58	0.0		8:58			
8:59	0.0		8:59			
9:00	0.1		9:00			
9:01	0.2		9:01			
9:02	0.5		9:02			
9:03	0.7		9:03			
9:04	0.5	0.2	9:04			
9:05	0.4	0.3	9:05			
9:06	0.1	0.3	9:06	0.0	0.0	-
9:07	0.1	0.2	9:07	0.0	0.0	-
9:08	0.1	0.2	9:08	0.0	0.0	-
9:09	0.0	0.2	9:09	0.0	0.0	-
9:10	0.0	0.2	9:10	0.0	0.0	-
9:11	0.7	0.2	9:11	0.0	0.0	-
9:12	0.0	0.2	9:12	0.0	0.0	-
9:13	0.2	0.2	9:13	0.0	0.0	-
9:14	0.0	0.2	9:14	0.0	0.0	-
9:15	0.0	0.2	9:15	0.0	0.0	-
9:16	0.1	0.2	9:16	0.0	0.0	-
9:17	0.3	0.2	9:17	0.0	0.0	-
9:18	0.4	0.2	9:18	0.0	0.0	-
9:19	0.3	0.2	9:19	0.0	0.0	-
9:20	0.2	0.2	9:20	0.0	0.0	-
9:21	0.1	0.2	9:21	0.0	0.0	-
9:22	0.1	0.2	9:22	0.0	0.0	-
9:23	0.0	0.2	9:23	0.0	0.0	-
9:24	0.0	0.2	9:24	0.0	0.0	-
9:25	0.1	0.2	9:25	0.0	0.0	-
9:26	0.2	0.1	9:26	0.0	0.0	-
9:27	0.5	0.2	9:27	0.0	0.0	-
9:28	0.7	0.2	9:28	0.0	0.0	-
9:29	0.5	0.2	9:29	0.0	0.0	-
9:30	0.4	0.3	9:30	0.0	0.0	-
9:31	0.1	0.3	9:31	0.0	0.0	-
9:32	0.1	0.2	9:32	0.0	0.0	-
9:33	0.1	0.2	9:33	0.0	0.0	-
9:34	0.0	0.2	9:34	0.0	0.0	-
9:35	0.0	0.2	9:35	0.0	0.0	-
9:36	0.7	0.2	9:36	0.0	0.0	-
9:37	0.0	0.2	9:37	0.0	0.0	-
9:38	0.2	0.2	9:38	0.0	0.0	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
9:39	0.0	0.2	9:39	0.0	0.0	-
9:40	0.0	0.2	9:40	0.0	0.0	-
9:41	0.1	0.2	9:41	0.0	0.0	-
9:42	0.3	0.2	9:42	0.0	0.0	-
9:43	0.4	0.2	9:43	0.0	0.0	-
9:44	0.3	0.2	9:44	0.0	0.0	-
9:45	0.2	0.2	9:45	0.0	0.0	-
9:46	0.1	0.2	9:46	0.0	0.0	-
9:47	0.1	0.2	9:47	0.0	0.0	-
9:48	0.0	0.2	9:48	0.0	0.0	-
9:49	0.0	0.2	9:49	0.0	0.0	-
9:50	0.1	0.2	9:50	0.0	0.0	-
9:51	0.2	0.1	9:51	0.0	0.0	-
9:52	0.5	0.2	9:52	0.0	0.0	-
9:53	0.7	0.2	9:53	0.0	0.0	-
9:54	0.5	0.2	9:54	0.0	0.0	-
9:55	0.4	0.3	9:55	0.0	0.0	-
9:56	0.1	0.3	9:56	0.0	0.0	-
9:57	0.1	0.2	9:57	0.0	0.0	-
9:58	0.1	0.2	9:58	0.0	0.0	-
9:59	0.0	0.2	9:59	0.0	0.0	-
10:00	0.0	0.2	10:00	0.0	0.0	-
10:01	0.7	0.2	10:01	0.0	0.0	-
10:02	0.0	0.2	10:02	0.0	0.0	-
10:03	0.2	0.2	10:03	0.0	0.0	-
10:04	0.3	0.3	10:04	0.0	0.0	-
10:05	0.3	0.3	10:05	0.0	0.0	-
10:06	0.3	0.3	10:06	0.0	0.0	-
10:07	0.3	0.3	10:07	0.0	0.0	-
10:08	0.3	0.2	10:08	0.0	0.0	-
10:09	0.3	0.2	10:09	0.0	0.0	-
10:10	0.3	0.2	10:10	0.0	0.0	-
10:11	0.3	0.2	10:11	0.0	0.0	-
10:12	0.3	0.2	10:12	0.0	0.0	-
10:13	0.3	0.2	10:13	0.0	0.0	-
10:14	0.3	0.3	10:14	0.0	0.0	-
10:15	0.3	0.3	10:15	0.0	0.0	-
10:16	0.3	0.3	10:16	0.0	0.0	-
10:17	0.3	0.3	10:17	0.0	0.0	-
10:18	0.0	0.3	10:18	0.0	0.0	-
10:19	0.0	0.2	10:19	0.0	0.0	-
10:20	0.0	0.2	10:20	0.0	0.0	-
10:21	0.0	0.2	10:21	0.0	0.0	-
10:22	0.0	0.2	10:22	0.0	0.0	-
10:23	0.0	0.2	10:23	0.0	0.0	-
10:24	0.0	0.2	10:24	0.0	0.0	-
10:25	0.0	0.1	10:25	0.0	0.0	-
10:26	0.0	0.1	10:26	0.0	0.0	-
10:27	0.0	0.1	10:27	0.0	0.0	-
10:28	0.0	0.1	10:28	0.0	0.0	-
10:29	0.0	0.1	10:29	0.0	0.0	-
10:30	0.0	0.0	10:30	0.0	0.0	-
10:31	0.0	0.0	10:31	0.0	0.0	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
10:32	0.0	0.0	10:32	0.0	0.0	-
10:33	0.0	0.0	10:33	0.0	0.0	-
10:34	0.0	0.0	10:34	0.0	0.0	-
10:35	0.0	0.0	10:35	0.0	0.0	-
10:36	0.0	0.0	10:36	0.0	0.0	-
10:37	0.0	0.0	10:37	0.0	0.0	-
10:38	0.0	0.0	10:38	0.0	0.0	-
10:39	0.0	0.0	10:39	0.0	0.0	-
10:40	0.0	0.0	10:40	0.0	0.0	-
10:41	0.0	0.0	10:41	0.0	0.0	-
10:42	0.0	0.0	10:42	0.0	0.0	-
10:43	0.0	0.0	10:43	0.0	0.0	-
10:44	0.0	0.0	10:44	0.0	0.0	-
10:45	0.0	0.0	10:45	0.0	0.0	-
10:46	0.0	0.0	10:46	0.0	0.0	-
10:47	0.0	0.0	10:47	0.0	0.0	-
10:48	0.0	0.0	10:48	0.0	0.0	-
10:49	0.0	0.0	10:49	0.0	0.0	-
10:50	0.0	0.0	10:50	0.0	0.0	-
10:51	0.0	0.0	10:51	0.0	0.0	-
10:52	0.0	0.0	10:52	0.0	0.0	-
10:53	0.0	0.0	10:53	0.0	0.0	-
10:54	0.0	0.0	10:54	0.0	0.0	-
10:55	0.0	0.0	10:55	0.0	0.0	-
10:56	0.0	0.0	10:56	0.0	0.0	-
10:57	0.0	0.0	10:57	0.0	0.0	-
10:58	0.0	0.0	10:58	0.0	0.0	-
10:59	0.0	0.0	10:59	0.0	0.0	-
11:00	0.0	0.0	11:00	0.0	0.0	-
11:01	0.0	0.0	11:01	0.0	0.0	-
11:02	0.0	0.0	11:02	0.0	0.0	-
11:03	0.0	0.0	11:03	0.0	0.0	-
11:04	0.0	0.0	11:04	0.0	0.0	-
11:05	0.0	0.0	11:05	0.0	0.0	-
11:06	0.0	0.0	11:06	0.0	0.0	-
11:07	0.1	0.0	11:07	0.0	0.0	-
11:08	0.3	0.0	11:08	0.0	0.0	-
11:09	0.4	0.1	11:09	0.0	0.0	-
11:10	0.3	0.1	11:10	0.0	0.0	-
11:11	0.2	0.1	11:11	0.0	0.0	-
11:12	0.1	0.1	11:12	0.0	0.0	-
11:13	0.1	0.1	11:13	0.0	0.0	-
11:14	0.0	0.1	11:14	0.0	0.0	-
11:15	0.0	0.1	11:15	0.0	0.0	-
11:16	0.1	0.1	11:16	0.0	0.0	-
11:17	0.2	0.1	11:17	0.0	0.0	-
11:18	0.5	0.2	11:18	0.0	0.0	-
11:19	0.7	0.2	11:19	0.0	0.0	-
11:20	0.5	0.2	11:20	0.0	0.0	-
11:21	0.4	0.3	11:21	0.0	0.0	-
11:22	0.1	0.3	11:22	0.0	0.0	-
11:23	0.1	0.2	11:23	0.0	0.0	-
11:24	0.1	0.2	11:24	0.0	0.0	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
11:25	0.0	0.2	11:25	0.0	0.0	-
11:26	0.0	0.2	11:26	0.0	0.0	-
11:27	0.7	0.2	11:27	0.0	0.0	-
11:28	0.0	0.2	11:28	0.0	0.0	-
11:29	0.2	0.2	11:29	0.0	0.0	-
11:30	0.3	0.3	11:30	0.0	0.0	-
11:31	0.3	0.3	11:31	0.0	0.0	-
11:32	0.3	0.3	11:32	0.0	0.0	-
11:33	0.3	0.3	11:33	0.0	0.0	-
11:34	0.3	0.2	11:34	0.0	0.0	-
11:35	0.3	0.2	11:35	0.0	0.0	-
11:36	0.3	0.2	11:36	0.0	0.0	-
11:37	0.3	0.2	11:37	0.0	0.0	-
11:38	0.3	0.2	11:38	0.0	0.0	-
11:39	0.3	0.2	11:39	0.0	0.0	-
11:40	0.3	0.3	11:40	0.0	0.0	-
11:41	0.3	0.3	11:41	0.0	0.0	-
11:42	0.3	0.3	11:42	0.0	0.0	-
11:43	0.3	0.3	11:43	0.0	0.0	-
11:44	0.3	0.3	11:44	0.0	0.0	-
11:45	0.3	0.3	11:45	0.0	0.0	-
11:46	0.3	0.3	11:46	0.0	0.0	-
11:47	0.3	0.3	11:47	0.0	0.0	-
11:48	0.3	0.3	11:48	0.0	0.0	-
11:49	0.3	0.3	11:49	0.0	0.0	-
11:50	0.3	0.3	11:50	0.0	0.0	-
11:51	0.3	0.3	11:51	0.0	0.0	-
11:52	0.3	0.3	11:52	0.0	0.0	-
11:53	0.3	0.3	11:53	0.0	0.0	-
11:54	0.3	0.3	11:54	0.0	0.0	-
11:55	0.3	0.3	11:55	0.0	0.0	-
11:56	0.3	0.3	11:56	0.0	0.0	-
11:57	0.3	0.3	11:57	0.0	0.0	-
11:58	0.3	0.3	11:58	0.0	0.0	-
11:59	0.3	0.3	11:59	0.0	0.0	-
12:00	0.3	0.3	12:00	0.0	0.0	-
12:01	0.3	0.3	12:01	0.0	0.0	-
12:02	0.5	0.3	12:02	0.0	0.0	-
12:03	0.4	0.3	12:03	0.0	0.0	-
12:04	0.1	0.3	12:04	0.0	0.0	-
12:05	0.1	0.3	12:05	0.0	0.0	-
12:06	0.1	0.3	12:06	0.0	0.0	-
12:07	0.0	0.3	12:07	0.0	0.0	-
12:08	0.0	0.3	12:08	0.0	0.0	-
12:09	0.4	0.3	12:09	0.0	0.0	-
12:10	0.1	0.2	12:10	0.0	0.0	-
12:11	0.1	0.2	12:11	0.0	0.0	-
12:12	0.3	0.2	12:12	0.0	0.0	-
12:13	0.3	0.2	12:13	0.0	0.0	-
12:14	0.3	0.2	12:14	0.0	0.0	-
12:15	0.3	0.2	12:15	0.0	0.0	-
12:16	0.3	0.2	12:16	0.0	0.0	-
12:17	0.3	0.2	12:17	0.0	0.0	-

PID DATA						
Upwind			**Downwind**			**Exceeds VOCs Alarm Limits**
Time	**VOC (ppm)**	**15-Minute Average**	**Time**	**VOC (ppm)**	**15-Minute Average**	
12:18	0.3	0.2	12:18	0.0	0.0	-
12:19	0.3	0.2	12:19	0.0	0.0	-
12:20	0.3	0.2	12:20	0.0	0.0	-
12:21	0.3	0.3	12:21	0.0	0.0	-
12:22	0.3	0.3	12:22	0.0	0.0	-
12:23	0.3	0.3	12:23	0.0	0.0	-
12:24	0.3	0.3	12:24	0.0	0.0	-
12:25	0.5	0.3	12:25	0.0	0.0	-
12:26	0.4	0.3	12:26	0.0	0.0	-
12:27	0.1	0.3	12:27	0.0	0.0	-
12:28	0.1	0.3	12:28	0.0	0.0	-
12:29	0.1	0.3	12:29	0.0	0.0	-
12:30	0.0	0.3	12:30	0.0	0.0	-
12:31	0.0	0.3	12:31	0.0	0.0	-
12:32	0.4	0.3	12:32	0.0	0.0	-
12:33	0.1	0.2	12:33	0.0	0.0	-
12:34	0.1	0.2	12:34	0.0	0.0	-
12:35	0.3	0.2	12:35	0.0	0.0	-
12:36	0.3	0.2	12:36	0.0	0.0	-
12:37	0.3	0.2	12:37	0.0	0.0	-
12:38	0.3	0.2	12:38	0.0	0.0	-
12:39	0.3	0.2	12:39	0.0	0.0	-
12:40	0.3	0.2	12:40	0.0	0.0	-
12:41	0.3	0.2	12:41	0.0	0.0	-
12:42	0.3	0.2	12:42	0.0	0.0	-
12:43	0.3	0.2	12:43	0.0	0.0	-
12:44	0.3	0.3	12:44	0.0	0.0	-
12:45	0.3	0.3	12:45	0.0	0.0	-
12:46	0.3	0.3	12:46	0.0	0.0	-
12:47	0.3	0.3	12:47	0.0	0.0	-
12:48	0.5	0.3	12:48	0.0	0.0	-
12:49	0.4	0.3	12:49	0.0	0.0	-
12:50	0.1	0.3	12:50	0.0	0.0	-
12:51	0.1	0.3	12:51	0.0	0.0	-
12:52	0.1	0.3	12:52	0.0	0.0	-
12:53	0.0	0.3	12:53	0.0	0.0	-
12:54	0.0	0.3	12:54	0.0	0.0	-
12:55	0.4	0.3	12:55	0.0	0.0	-
12:56	0.1	0.2	12:56	0.0	0.0	-
12:57	0.1	0.2	12:57	0.0	0.0	-
12:58	0.3	0.2	12:58	0.0	0.0	-
12:59	0.3	0.2	12:59	0.0	0.0	-
13:00	0.3	0.2	13:00	0.0	0.0	-
13:01	0.3	0.2	13:01	0.0	0.0	-
13:02	0.3	0.2	13:02	0.0	0.0	-
13:03	0.3	0.2	13:03	0.0	0.0	-
13:04	0.3	0.2	13:04	0.0	0.0	-
13:05	0.3	0.2	13:05	0.0	0.0	-
13:06	0.3	0.2	13:06	0.0	0.0	-
13:07	0.3	0.3	13:07	0.0	0.0	-
13:08	0.3	0.3	13:08	0.0	0.0	-
13:09	0.3	0.3	13:09	0.0	0.0	-
13:10	0.3	0.3	13:10	0.0	0.0	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
13:11	0.5	0.3	13:11	0.0	0.0	-
13:12	0.4	0.3	13:12	0.0	0.0	-
13:13	0.1	0.3	13:13	0.0	0.0	-
13:14	0.1	0.3	13:14	0.0	0.0	-
13:15	0.1	0.3	13:15	0.0	0.0	-
13:16	0.0	0.3	13:16	0.0	0.0	-
13:17	0.0	0.3	13:17	0.0	0.0	-
13:18	0.4	0.3	13:18	0.0	0.0	-
13:19	0.1	0.2	13:19	0.0	0.0	-
13:20	0.1	0.2	13:20	0.0	0.0	-
13:21	0.1	0.2	13:21	0.0	0.0	-
13:22	0.0	0.2	13:22	0.0	0.0	-
13:23	0.0	0.2	13:23	0.0	0.0	-
13:24	0.4	0.2	13:24	0.0	0.0	-
13:25	0.1	0.2	13:25	0.0	0.0	-
13:26	0.1	0.1	13:26	0.0	0.0	-
13:27	0.1	0.1	13:27	0.0	0.0	-
13:28	0.0	0.1	13:28	0.0	0.0	-
13:29	0.0	0.1	13:29	0.0	0.0	-
13:30	0.4	0.1	13:30	0.0	0.0	-
13:31	0.1	0.1	13:31	0.0	0.0	-
13:32	0.1	0.1	13:32	0.0	0.0	-
13:33	0.1	0.1	13:33	0.0	0.0	-
13:34	0.0	0.1	13:34	0.0	0.0	-
13:35	0.0	0.1	13:35	0.0	0.0	-
13:36	0.4	0.1	13:36	0.0	0.0	-
13:37	0.1	0.1	13:37	0.0	0.0	-
13:38	0.1	0.1	13:38	0.0	0.0	-
13:39	0.1	0.1	13:39	0.0	0.0	-
13:40	0.0	0.1	13:40	0.0	0.0	-
13:41	0.0	0.1	13:41	0.0	0.0	-
13:42	0.4	0.1	13:42	0.0	0.0	-
13:43	0.1	0.1	13:43	0.0	0.0	-
13:44	0.1	0.1	13:44	0.0	0.0	-
13:45	0.1	0.1	13:45	0.0	0.0	-
13:46	0.0	0.1	13:46	0.0	0.0	-
13:47	0.0	0.1	13:47	0.0	0.0	-
13:48	0.4	0.1	13:48	0.0	0.0	-
13:49	0.1	0.1	13:49	0.0	0.0	-
13:50	0.1	0.1	13:50	0.0	0.0	-
13:51	0.1	0.1	13:51	0.0	0.0	-
13:52	0.1	0.1	13:52	0.0	0.0	-
13:53	0.1	0.1	13:53	0.0	0.0	-
13:54	0.0	0.1	13:54	0.0	0.0	-
13:55	0.0	0.1	13:55	0.0	0.0	-
13:56	0.4	0.1	13:56	0.0	0.0	-
13:57	0.1	0.1	13:57	0.0	0.0	-
13:58	0.1	0.1	13:58	0.0	0.0	-
13:59	0.1	0.1	13:59	0.0	0.0	-
14:00	0.0	0.1	14:00	0.0	0.0	-
14:01	0.0	0.1	14:01	0.0	0.0	-
14:02	0.4	0.1	14:02	0.0	0.0	-
14:03	0.1	0.1	14:03	0.0	0.0	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
14:04	0.1	0.1	14:04	0.0	0.0	-
14:05			14:05	0.0	0.0	
14:06			14:06	0.0	0.0	
14:07			14:07	0.0	0.0	
14:08			14:08	0.0	0.0	
14:09			14:09	0.0	0.0	
14:10			14:10	0.0	0.0	
14:11			14:11	0.0	0.0	
14:12			14:12	0.0	0.0	
14:13			14:13	0.0	0.0	
14:14			14:14	0.0	0.0	
14:15			14:15	0.0	0.0	
14:16			14:16	0.0	0.0	
14:17			14:17	0.0	0.0	
14:18			14:18	0.0	0.0	
14:19			14:19	0.0	0.0	
14:20			14:20	0.0	0.0	
14:21			14:21	0.0	0.0	
14:22			14:22	0.0	0.0	
14:23			14:23	0.0	0.0	
14:24			14:24	0.0	0.0	
14:25			14:25	0.0	0.0	
14:26			14:26	0.0	0.0	
14:27			14:27	0.0	0.0	
14:28			14:28	0.0	0.0	
14:29			14:29	0.0	0.0	
14:30			14:30	0.0	0.0	
14:31			14:31	0.0	0.0	
14:32			14:32	0.0	0.0	
14:33			14:33	0.0	0.0	
14:34			14:34	0.0	0.0	
14:35			14:35	0.0	0.0	
14:36			14:36	0.0	0.0	
14:37			14:37	0.0	0.0	
14:38			14:38	0.0	0.0	
14:39			14:39	0.0	0.0	
14:40			14:40	0.0	0.0	
14:41			14:41	0.0	0.0	
14:42			14:42	0.0	0.0	
14:43			14:43	0.0	0.0	
14:44			14:44	0.0	0.0	
14:45			14:45	0.0	0.0	
14:46			14:46	0.0	0.0	

LANGAN

215 North 10th Street
170482201
CAMP Data Summary

Date: 11/21/2017
Observer: Kim Nagotko

Particulate Monitoring		
	Upwind	**Downwind**
Minimum 15min Average	0.017	0.011
Maximum 15min Average	0.030	0.027
(15min >1.5 + Upwind level)	N/A	0
Minimum 1min Reading	0.015	0.010
Maximum 1min Reading	0.031	0.051

Organic Vapor Monitoring		
	Upwind	**Downwind**
Minimum 15min Average	0.0	0.0
Maximum 15min Average	0.0	0.9
(15min >5+Upwind level)	N/A	0.0
Minimum 1min Reading	0.0	0.0
Maximum 1min Reading	0.1	1.5

All reported particulate concentrations are in mg/m3 or milligrams per cubic meter and all reported organic vapor concentrations are in ppm or parts per million, unless specified otherwise.

Tuesday, November 21, 2017

Number of Instances Where Downwind Particulates Exceeds Upwind Particulate + .150 mg/m^3 = 0

Number of Comparable Data Points = 404

PARTICULATE DATA

Upwind			**Downwind**			**Exceeds Particulate Alarm Limits**
Time	**PM 10 (mg/m^3)**	**15-Minute Average**	**Time**	**PM 10 (mg/m^3)**	**15-Minute Average**	
7:23	0.026		7:23			
7:24	0.025		7:24	0.029		
7:25	0.025		7:25	0.021		
7:26	0.025		7:26	0.022		
7:27	0.026		7:27	0.021		
7:28	0.025		7:28	0.022		
7:29	0.026		7:29	0.021		
7:30	0.026		7:30	0.021		
7:31	0.027		7:31	0.021		
7:32	0.028		7:32	0.021		
7:33	0.029		7:33	0.042		
7:34	0.029		7:34	0.029		
7:35	0.028		7:35	0.030		
7:36	0.029		7:36	0.022		
7:37	0.030		7:37	0.030	0.025	
7:38	0.029		7:38	0.031	0.026	
7:39	0.028		7:39	0.025	0.025	
7:40	0.028		7:40	0.023	0.025	
7:41	0.028	0.028	7:41	0.022	0.025	-
7:42	0.029	0.028	7:42	0.026	0.026	-
7:43	0.029	0.028	7:43	0.034	0.027	-
7:44	0.030	0.028	7:44	0.022	0.027	-
7:45	0.030	0.029	7:45	0.022	0.027	-
7:46	0.030	0.029	7:46	0.023	0.027	-
7:47	0.030	0.029	7:47	0.023	0.027	-
7:48	0.031	0.029	7:48	0.023	0.026	-
7:49	0.030	0.029	7:49	0.023	0.025	-
7:50	0.029	0.029	7:50	0.023	0.025	-
7:51	0.030	0.029	7:51	0.023	0.025	-
7:52	0.029	0.029	7:52	0.023	0.024	-
7:53	0.031	0.029	7:53	0.023	0.024	-
7:54	0.030	0.030	7:54	0.024	0.024	-
7:55	0.030	0.030	7:55	0.023	0.024	-
7:56	0.028	0.030	7:56	0.024	0.024	-
7:57	0.028	0.030	7:57	0.023	0.024	-
7:58	0.029	0.030	7:58	0.024	0.023	-
7:59	0.029	0.030	7:59	0.025	0.023	-
8:00	0.029	0.030	8:00	0.025	0.023	-
8:01	0.030	0.030	8:01	0.024	0.024	-
8:02	0.030	0.030	8:02	0.023	0.024	-
8:03	0.029	0.029	8:03	0.024	0.024	-
8:04	0.030	0.029	8:04	0.024	0.024	-
8:05	0.029	0.029	8:05	0.024	0.024	-
8:06	0.030	0.029	8:06	0.024	0.024	-
8:07	0.029	0.029	8:07	0.024	0.024	-
8:08	0.030	0.029	8:08	0.024	0.024	-
8:09	0.030	0.029	8:09	0.023	0.024	-
8:10	0.030	0.029	8:10	0.023	0.024	-
8:11	0.030	0.029	8:11	0.023	0.024	-
8:12	0.030	0.030	8:12	0.023	0.024	-
8:13	0.030	0.030	8:13	0.023	0.024	-
8:14	0.029	0.030	8:14	0.023	0.024	-
8:15	0.029	0.030	8:15	0.024	0.024	-
8:16	0.027	0.029	8:16	0.023	0.023	-
8:17	0.027	0.029	8:17	0.023	0.023	-
8:18	0.027	0.029	8:18	0.023	0.023	-
8:19	0.026	0.029	8:19	0.024	0.023	-
8:20	0.028	0.029	8:20	0.024	0.023	-
8:21	0.026	0.029	8:21	0.023	0.023	-
8:22	0.026	0.028	8:22	0.023	0.023	-
8:23	0.027	0.028	8:23	0.023	0.023	-
8:24	0.027	0.028	8:24	0.023	0.023	-

PARTICULATE DATA						
Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
8:25	0.027	0.028	8:25	0.023	0.023	-
8:26	0.027	0.028	8:26	0.023	0.023	-
8:27	0.026	0.027	8:27	0.022	0.023	-
8:28	0.026	0.027	8:28	0.023	0.023	-
8:29	0.027	0.027	8:29	0.022	0.023	-
8:30	0.027	0.027	8:30	0.022	0.023	-
8:31	0.028	0.027	8:31	0.023	0.023	-
8:32	0.027	0.027	8:32	0.022	0.023	-
8:33	0.028	0.027	8:33	0.022	0.023	-
8:34	0.027	0.027	8:34	0.022	0.023	-
8:35	0.028	0.027	8:35	0.023	0.023	-
8:36	0.027	0.027	8:36	0.023	0.023	-
8:37	0.029	0.027	8:37	0.023	0.023	-
8:38	0.029	0.027	8:38	0.023	0.023	-
8:39	0.028	0.027	8:39	0.023	0.023	-
8:40	0.027	0.027	8:40	0.022	0.023	-
8:41	0.029	0.028	8:41	0.023	0.023	-
8:42	0.029	0.028	8:42	0.023	0.023	-
8:43	0.029	0.028	8:43	0.023	0.023	-
8:44	0.028	0.028	8:44	0.022	0.023	-
8:45	0.027	0.028	8:45	0.022	0.023	-
8:46	0.028	0.028	8:46	0.022	0.023	-
8:47	0.028	0.028	8:47	0.022	0.023	-
8:48	0.027	0.028	8:48	0.022	0.023	-
8:49	0.027	0.028	8:49	0.022	0.023	-
8:50	0.026	0.028	8:50	0.022	0.022	-
8:51	0.026	0.028	8:51	0.021	0.022	-
8:52	0.026	0.028	8:52	0.022	0.022	-
8:53	0.027	0.027	8:53	0.022	0.022	-
8:54	0.026	0.027	8:54	0.022	0.022	-
8:55	0.025	0.027	8:55	0.022	0.022	-
8:56	0.026	0.027	8:56	0.021	0.022	-
8:57	0.026	0.027	8:57	0.021	0.022	-
8:58	0.026	0.027	8:58	0.022	0.022	-
8:59	0.026	0.026	8:59	0.022	0.022	-
9:00	0.026	0.026	9:00	0.022	0.022	-
9:01	0.025	0.026	9:01	0.022	0.022	-
9:02	0.025	0.026	9:02	0.022	0.022	-
9:03	0.027	0.026	9:03	0.022	0.022	-
9:04	0.026	0.026	9:04	0.022	0.022	-
9:05	0.027	0.026	9:05	0.022	0.022	-
9:06	0.029	0.026	9:06	0.022	0.022	-
9:07	0.028	0.026	9:07	0.021	0.022	-
9:08	0.028	0.026	9:08	0.021	0.022	-
9:09	0.027	0.026	9:09	0.022	0.022	-
9:10	0.026	0.027	9:10	0.022	0.022	-
9:11	0.027	0.027	9:11	0.022	0.022	-
9:12	0.027	0.027	9:12	0.021	0.022	-
9:13	0.027	0.027	9:13	0.021	0.022	-
9:14	0.028	0.027	9:14	0.021	0.022	-
9:15	0.026	0.027	9:15	0.021	0.022	-
9:16	0.027	0.027	9:16	0.020	0.021	-
9:17	0.027	0.027	9:17	0.021	0.021	-
9:18	0.030	0.027	9:18	0.022	0.021	-
9:19	0.025	0.027	9:19	0.022	0.021	-
9:20	0.025	0.027	9:20	0.021	0.021	-
9:21	0.025	0.027	9:21	0.021	0.021	-
9:22	0.025	0.027	9:22	0.021	0.021	-
9:23	0.026	0.027	9:23	0.021	0.021	-
9:24	0.023	0.026	9:24	0.020	0.021	-
9:25	0.023	0.026	9:25	0.020	0.021	-
9:26	0.025	0.026	9:26	0.020	0.021	-
9:27	0.026	0.026	9:27	0.020	0.021	-
9:28	0.027	0.026	9:28	0.020	0.021	-
9:29	0.026	0.026	9:29	0.020	0.021	-

PARTICULATE DATA						
Upwind			**Downwind**			**Exceeds Particulate Alarm Limits**
Time	**PM 10 (mg/m^3)**	**15-Minute Average**	**Time**	**PM 10 (mg/m^3)**	**15-Minute Average**	
9:30	0.025	0.026	9:30	0.020	0.021	-
9:31	0.025	0.026	9:31	0.020	0.021	-
9:32	0.025	0.025	9:32	0.020	0.021	-
9:33	0.024	0.025	9:33	0.021	0.020	-
9:34	0.024	0.025	9:34	0.020	0.020	-
9:35	0.025	0.025	9:35	0.020	0.020	-
9:36	0.024	0.025	9:36	0.020	0.020	-
9:37	0.025	0.025	9:37	0.020	0.020	-
9:38	0.024	0.025	9:38	0.021	0.020	-
9:39	0.023	0.025	9:39	0.020	0.020	-
9:40	0.023	0.025	9:40	0.021	0.020	-
9:41	0.023	0.025	9:41	0.021	0.020	-
9:42	0.023	0.024	9:42	0.021	0.020	-
9:43	0.024	0.024	9:43	0.021	0.020	-
9:44	0.024	0.024	9:44	0.021	0.020	-
9:45	0.025	0.024	9:45	0.020	0.020	-
9:46	0.026	0.024	9:46	0.020	0.020	-
9:47	0.024	0.024	9:47	0.019	0.020	-
9:48	0.025	0.024	9:48	0.020	0.020	-
9:49	0.025	0.024	9:49	0.020	0.020	-
9:50	0.023	0.024	9:50	0.020	0.020	-
9:51	0.024	0.024	9:51	0.020	0.020	-
9:52	0.023	0.024	9:52	0.020	0.020	-
9:53	0.022	0.024	9:53	0.020	0.020	-
9:54	0.023	0.024	9:54	0.019	0.020	-
9:55	0.023	0.024	9:55	0.020	0.020	-
9:56	0.023	0.024	9:56	0.020	0.020	-
9:57	0.023	0.024	9:57	0.020	0.020	-
9:58	0.024	0.024	9:58	0.019	0.020	-
9:59	0.024	0.024	9:59	0.019	0.020	-
10:00	0.025	0.024	10:00	0.019	0.020	-
10:01	0.024	0.024	10:01	0.019	0.020	-
10:02	0.025	0.024	10:02	0.019	0.020	-
10:03	0.023	0.024	10:03	0.019	0.020	-
10:04	0.022	0.023	10:04	0.020	0.020	-
10:05	0.022	0.023	10:05	0.020	0.020	-
10:06	0.022	0.023	10:06	0.020	0.020	-
10:07	0.022	0.023	10:07	0.020	0.020	-
10:08	0.021	0.023	10:08	0.019	0.019	-
10:09	0.021	0.023	10:09	0.018	0.019	-
10:10	0.021	0.023	10:10	0.019	0.019	-
10:11	0.021	0.023	10:11	0.018	0.019	-
10:12	0.020	0.022	10:12	0.019	0.019	-
10:13	0.021	0.022	10:13	0.018	0.019	-
10:14	0.020	0.022	10:14	0.018	0.019	-
10:15	0.021	0.022	10:15	0.018	0.019	-
10:16	0.023	0.022	10:16	0.018	0.019	-
10:17	0.026	0.022	10:17	0.018	0.019	-
10:18	0.021	0.022	10:18	0.018	0.019	-
10:19	0.021	0.022	10:19	0.017	0.019	-
10:20	0.022	0.022	10:20	0.018	0.018	-
10:21	0.020	0.021	10:21	0.020	0.018	-
10:22	0.019	0.021	10:22	0.020	0.018	-
10:23	0.020	0.021	10:23	0.017	0.018	-
10:24	0.020	0.021	10:24	0.017	0.018	-
10:25	0.020	0.021	10:25	0.017	0.018	-
10:26	0.020	0.021	10:26	0.017	0.018	-
10:27	0.020	0.021	10:27	0.017	0.018	-
10:28	0.020	0.021	10:28	0.017	0.018	-
10:29	0.020	0.021	10:29	0.017	0.018	-
10:30	0.020	0.021	10:30	0.017	0.018	-
10:31	0.021	0.021	10:31	0.017	0.018	-
10:32	0.022	0.020	10:32	0.017	0.018	-
10:33	0.020	0.020	10:33	0.017	0.017	-
10:34	0.021	0.020	10:34	0.017	0.017	-

PARTICULATE DATA

Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
10:35	0.022	0.020	10:35	0.017	0.017	-
10:36	0.021	0.020	10:36	0.017	0.017	-
10:37	0.021	0.021	10:37	0.017	0.017	-
10:38	0.020	0.021	10:38	0.017	0.017	-
10:39	0.021	0.021	10:39	0.017	0.017	-
10:40	0.021	0.021	10:40	0.017	0.017	-
10:41	0.020	0.021	10:41	0.018	0.017	-
10:42	0.020	0.021	10:42	0.018	0.017	-
10:43	0.020	0.021	10:43	0.017	0.017	-
10:44	0.020	0.021	10:44	0.017	0.017	-
10:45	0.020	0.021	10:45	0.018	0.017	-
10:46	0.020	0.021	10:46	0.017	0.017	-
10:47	0.023	0.021	10:47	0.017	0.017	-
10:48	0.021	0.021	10:48	0.017	0.017	-
10:49	0.019	0.021	10:49	0.017	0.017	-
10:50	0.019	0.020	10:50	0.016	0.017	-
10:51	0.019	0.020	10:51	0.017	0.017	-
10:52	0.018	0.020	10:52	0.017	0.017	-
10:53	0.016	0.020	10:53	0.017	0.017	-
10:54	0.017	0.020	10:54	0.016	0.017	-
10:55	0.018	0.019	10:55	0.015	0.017	-
10:56	0.017	0.019	10:56	0.015	0.017	-
10:57	0.018	0.019	10:57	0.015	0.017	-
10:58	0.018	0.019	10:58	0.015	0.016	-
10:59	0.018	0.019	10:59	0.014	0.016	-
11:00	0.017	0.019	11:00	0.014	0.016	-
11:01	0.017	0.018	11:01	0.015	0.016	-
11:02	0.018	0.018	11:02	0.015	0.016	-
11:03	0.017	0.018	11:03	0.015	0.016	-
11:04	0.017	0.018	11:04	0.015	0.015	-
11:05	0.019	0.018	11:05	0.015	0.015	-
11:06	0.018	0.018	11:06	0.014	0.015	-
11:07	0.019	0.018	11:07	0.015	0.015	-
11:08	0.017	0.018	11:08	0.015	0.015	-
11:09	0.019	0.018	11:09	0.015	0.015	-
11:10	0.017	0.018	11:10	0.016	0.015	-
11:11	0.018	0.018	11:11	0.015	0.015	-
11:12	0.017	0.018	11:12	0.015	0.015	-
11:13	0.017	0.018	11:13	0.015	0.015	-
11:14	0.017	0.018	11:14	0.015	0.015	-
11:15	0.017	0.018	11:15	0.016	0.015	-
11:16	0.016	0.018	11:16	0.014	0.015	-
11:17	0.016	0.017	11:17	0.014	0.015	-
11:18	0.016	0.017	11:18	0.014	0.015	-
11:19	0.016	0.017	11:19	0.014	0.015	-
11:20	0.016	0.017	11:20	0.014	0.015	-
11:21	0.017	0.017	11:21	0.013	0.015	-
11:22	0.017	0.017	11:22	0.013	0.015	-
11:23	0.021	0.017	11:23	0.013	0.014	-
11:24	0.018	0.017	11:24	0.013	0.014	-
11:25	0.017	0.017	11:25	0.014	0.014	-
11:26	0.017	0.017	11:26	0.014	0.014	-
11:27	0.017	0.017	11:27	0.014	0.014	-
11:28	0.018	0.017	11:28	0.014	0.014	-
11:29	0.018	0.017	11:29	0.014	0.014	-
11:30	0.018	0.017	11:30	0.014	0.014	-
11:31	0.020	0.017	11:31	0.014	0.014	-
11:32	0.021	0.018	11:32	0.014	0.014	-
11:33	0.021	0.018	11:33	0.014	0.014	-
11:34	0.021	0.018	11:34	0.014	0.014	-
11:35	0.020	0.019	11:35	0.015	0.014	-
11:36	0.020	0.019	11:36	0.015	0.014	-
11:37	0.019	0.019	11:37	0.017	0.014	-
11:38	0.021	0.019	11:38	0.017	0.014	-
11:39	0.026	0.020	11:39	0.017	0.015	-

PARTICULATE DATA						
Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
11:40	0.025	0.020	11:40	0.016	0.015	-
11:41	0.022	0.020	11:41	0.015	0.015	-
11:42	0.018	0.021	11:42	0.015	0.015	-
11:43	0.018	0.021	11:43	0.014	0.015	-
11:44	0.018	0.021	11:44	0.018	0.015	-
11:45	0.016	0.020	11:45	0.023	0.016	-
11:46	0.017	0.020	11:46	0.021	0.016	-
11:47	0.017	0.020	11:47	0.016	0.016	-
11:48	0.018	0.020	11:48	0.015	0.017	-
11:49	0.019	0.020	11:49	0.016	0.017	-
11:50	0.018	0.019	11:50	0.015	0.017	-
11:51	0.018	0.019	11:51	0.015	0.017	-
11:52	0.020	0.019	11:52	0.014	0.016	-
11:53	0.023	0.020	11:53	0.014	0.016	-
11:54	0.020	0.019	11:54	0.015	0.016	-
11:55	0.020	0.019	11:55	0.015	0.016	-
11:56	0.019	0.019	11:56	0.014	0.016	-
11:57	0.019	0.019	11:57	0.015	0.016	-
11:58	0.018	0.019	11:58	0.016	0.016	-
11:59	0.018	0.019	11:59	0.017	0.016	-
12:00	0.018	0.019	12:00	0.014	0.015	-
12:01	0.018	0.019	12:01	0.014	0.015	-
12:02	0.018	0.019	12:02	0.013	0.015	-
12:03	0.018	0.019	12:03	0.013	0.015	-
12:04	0.020	0.019	12:04	0.013	0.014	-
12:05	0.019	0.019	12:05	0.013	0.014	-
12:06	0.019	0.019	12:06	0.013	0.014	-
12:07	0.025	0.019	12:07	0.013	0.014	-
12:08	0.027	0.020	12:08	0.014	0.014	-
12:09	0.023	0.020	12:09	0.013	0.014	-
12:10	0.021	0.020	12:10	0.013	0.014	-
12:11	0.019	0.020	12:11	0.013	0.014	-
12:12	0.020	0.020	12:12	0.017	0.014	-
12:13	0.019	0.020	12:13	0.014	0.014	-
12:14	0.019	0.020	12:14	0.014	0.014	-
12:15	0.021	0.020	12:15	0.013	0.014	-
12:16	0.020	0.021	12:16	0.013	0.013	-
12:17	0.021	0.021	12:17	0.013	0.013	-
12:18	0.019	0.021	12:18	0.013	0.013	-
12:19	0.020	0.021	12:19	0.013	0.013	-
12:20	0.020	0.021	12:20	0.014	0.014	-
12:21	0.021	0.021	12:21	0.014	0.014	-
12:22	0.019	0.021	12:22	0.013	0.014	-
12:23	0.022	0.020	12:23	0.014	0.014	-
12:24	0.019	0.020	12:24	0.014	0.014	-
12:25	0.022	0.020	12:25	0.013	0.014	-
12:26	0.022	0.020	12:26	0.014	0.014	-
12:27	0.020	0.020	12:27	0.014	0.014	-
12:28	0.018	0.020	12:28	0.014	0.014	-
12:29	0.017	0.020	12:29	0.014	0.014	-
12:30	0.019	0.020	12:30	0.014	0.014	-
12:31	0.017	0.020	12:31	0.014	0.014	-
12:32	0.028	0.020	12:32	0.014	0.014	-
12:33	0.019	0.020	12:33	0.013	0.014	-
12:34	0.021	0.020	12:34	0.012	0.014	-
12:35	0.017	0.020	12:35	0.011	0.013	-
12:36	0.016	0.020	12:36	0.012	0.013	-
12:37	0.016	0.020	12:37	0.012	0.013	-
12:38	0.018	0.019	12:38	0.011	0.013	-
12:39	0.018	0.019	12:39	0.011	0.013	-
12:40	0.019	0.019	12:40	0.011	0.013	-
12:41	0.020	0.019	12:41	0.012	0.013	-
12:42	0.018	0.019	12:42	0.011	0.012	-
12:43	0.019	0.019	12:43	0.012	0.012	-
12:44	0.018	0.019	12:44	0.012	0.012	-

PARTICULATE DATA						
Upwind			Downwind			Exceeds Particulate Alarm Limits
Time	PM 10 (mg/m^3)	15-Minute Average	Time	PM 10 (mg/m^3)	15-Minute Average	
12:45	0.018	0.019	12:45	0.013	0.012	-
12:46	0.018	0.019	12:46	0.014	0.012	-
12:47	0.019	0.018	12:47	0.013	0.012	-
12:48	0.016	0.018	12:48	0.013	0.012	-
12:49	0.017	0.018	12:49	0.013	0.012	-
12:50	0.018	0.018	12:50	0.012	0.012	-
12:51	0.017	0.018	12:51	0.011	0.012	-
12:52	0.019	0.018	12:52	0.011	0.012	-
12:53	0.021	0.018	12:53	0.010	0.012	-
12:54	0.018	0.018	12:54	0.010	0.012	-
12:55	0.017	0.018	12:55	0.010	0.012	-
12:56	0.017	0.018	12:56	0.011	0.012	-
12:57	0.018	0.018	12:57	0.011	0.012	-
12:58	0.018	0.018	12:58	0.011	0.012	-
12:59	0.017	0.018	12:59	0.011	0.012	-
13:00	0.017	0.018	13:00	0.012	0.012	-
13:01	0.017	0.018	13:01	0.011	0.011	-
13:02	0.016	0.018	13:02	0.011	0.011	-
13:03	0.018	0.018	13:03	0.010	0.011	-
13:04	0.019	0.018	13:04	0.011	0.011	-
13:05	0.019	0.018	13:05	0.010	0.011	-
13:06	0.021	0.018	13:06	0.010	0.011	-
13:07	0.022	0.018	13:07	0.011	0.011	-
13:08	0.022	0.018	13:08	0.011	0.011	-
13:09	0.019	0.018	13:09	0.013	0.011	-
13:10	0.018	0.019	13:10	0.013	0.011	-
13:11	0.017	0.019	13:11	0.013	0.011	-
13:12	0.018	0.019	13:12	0.015	0.012	-
13:13	0.019	0.019	13:13	0.015	0.012	-
13:14	0.018	0.019	13:14	0.012	0.012	-
13:15	0.018	0.019	13:15	0.011	0.012	-
13:16	0.019	0.019	13:16	0.010	0.012	-
13:17	0.017	0.019	13:17	0.011	0.012	-
13:18	0.020	0.019	13:18	0.013	0.012	-
13:19	0.019	0.019	13:19	0.011	0.012	-
13:20	0.020	0.019	13:20	0.012	0.012	-
13:21	0.019	0.019	13:21	0.012	0.012	-
13:22	0.020	0.019	13:22	0.012	0.012	-
13:23	0.020	0.019	13:23	0.012	0.012	-
13:24	0.019	0.019	13:24	0.012	0.012	-
13:25	0.019	0.019	13:25	0.012	0.012	-
13:26	0.017	0.019	13:26	0.011	0.012	-
13:27	0.018	0.019	13:27	0.012	0.012	-
13:28	0.019	0.019	13:28	0.012	0.012	-
13:29	0.018	0.019	13:29	0.013	0.012	-
13:30	0.017	0.019	13:30	0.013	0.012	-
13:31	0.017	0.019	13:31	0.013	0.012	-
13:32	0.017	0.019	13:32	0.012	0.012	-
13:33	0.016	0.018	13:33	0.012	0.012	-
13:34	0.015	0.018	13:34	0.012	0.012	-
13:35	0.016	0.018	13:35	0.012	0.012	-
13:36	0.017	0.018	13:36	0.011	0.012	-
13:37	0.017	0.017	13:37	0.011	0.012	-
13:38	0.019	0.017	13:38	0.011	0.012	-
13:39	0.016	0.017	13:39	0.010	0.012	-
13:40	0.015	0.017	13:40	0.011	0.012	-
13:41	0.016	0.017	13:41	0.011	0.012	-
13:42	0.017	0.017	13:42	0.011	0.012	-
13:43	0.016	0.017	13:43	0.011	0.012	-
13:44	0.016	0.016	13:44	0.010	0.011	-
13:45	0.018	0.017	13:45	0.010	0.011	-
13:46	0.017	0.017	13:46	0.010	0.011	-
13:47	0.016	0.016	13:47	0.010	0.011	-
13:48	0.016	0.016	13:48	0.010	0.011	-
13:49	0.016	0.017	13:49	0.010	0.011	-

PARTICULATE DATA						
Upwind			**Downwind**			**Exceeds Particulate Alarm Limits**
Time	**PM 10 (mg/m^3)**	**15-Minute Average**	**Time**	**PM 10 (mg/m^3)**	**15-Minute Average**	
13:50	0.015	0.016	13:50	0.010	0.010	-
13:51	0.017	0.016	13:51	0.010	0.010	-
13:52	0.022	0.017	13:52	0.010	0.010	-
13:53	0.021	0.017	13:53	0.010	0.010	-
13:54	0.017	0.017	13:54	0.010	0.010	-
13:55	0.015	0.017	13:55	0.010	0.010	-
13:56	0.017	0.017	13:56	0.010	0.010	-
13:57	0.018	0.017	13:57	0.015	0.010	-
13:58	0.015	0.017	13:58	0.013	0.011	-
13:59	0.015	0.017	13:59	0.011	0.011	-
14:00	0.015	0.017	14:00	0.010	0.011	-
14:01	0.017	0.017	14:01	0.010	0.011	-
14:02	0.016	0.017	14:02	0.009	0.011	-
14:03	0.015	0.017	14:03	0.009	0.010	-
14:04	0.015	0.017	14:04	0.010	0.010	-
14:05	0.019	0.017	14:05	0.011	0.011	-
14:06	0.017	0.017	14:06	0.010	0.011	-
14:07	0.019	0.017	14:07	0.011	0.011	-
14:08	0.016	0.016	14:08	0.010	0.011	-
14:09	0.016	0.016	14:09	0.010	0.011	-
14:10	0.017	0.016	14:10	0.011	0.011	-
14:11	0.019	0.017	14:11	0.013	0.011	-
14:12	0.020	0.017	14:12	0.012	0.011	-
14:13	0.018	0.017	14:13	0.011	0.011	-
14:14	0.024	0.018	14:14	0.010	0.010	-
14:15	0.021	0.018	14:15	0.012	0.011	-
14:16	0.020	0.018	14:16	0.012	0.011	-
14:17	0.022	0.019	14:17	0.013	0.011	-
14:18	0.018	0.019	14:18	0.013	0.011	-
14:19	0.017	0.019	14:19	0.012	0.011	-
14:20	0.018	0.019	14:20	0.014	0.012	-
14:21	0.022	0.019	14:21	0.051	0.014	-
14:22	0.021	0.019	14:22	0.014	0.015	-
14:23	0.018	0.019	14:23	0.012	0.015	-
14:24	0.027	0.020	14:24	0.012	0.015	-
14:25			14:25	0.011	0.015	
14:26			14:26	0.013	0.015	
14:27			14:27	0.013	0.015	
14:28			14:28	0.013	0.015	
14:29			14:29	0.014	0.015	
14:30			14:30	0.024	0.016	
14:31			14:31	0.046	0.018	
14:32			14:32	0.011	0.018	
14:33			14:33	0.011	0.018	
14:34			14:34	0.010	0.018	
14:35			14:35	0.010	0.018	
14:36			14:36	0.010	0.015	
14:37			14:37	0.009	0.015	
14:38			14:38	0.010	0.014	
14:39			14:39	0.013	0.015	
14:40			14:40	0.013	0.015	
14:41			14:41	0.011	0.015	
14:42			14:42	0.010	0.014	

Tuesday, November 21, 2017						
Number of Instances Where Downwind VOCs Exceeds Upwind VOCs + 5ppm =						0
Number of Comparable Data Points =						385
PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
7:40	0.0		7:40			
7:41	0.0		7:41			
7:42	0.0		7:42			
7:43	0.0		7:43			
7:44	0.0		7:44			
7:45	0.0		7:45			
7:46	0.0		7:46			
7:47	0.1		7:47			
7:48	0.0		7:48			
7:49	0.0		7:49	0.0		
7:50	0.0		7:50	0.0		
7:51	0.0		7:51	0.0		
7:52	0.0		7:52	0.0		
7:53	0.0		7:53	0.0		
7:54	0.0		7:54	0.0		
7:55	0.0	0.0	7:55	0.0		
7:56	0.0	0.0	7:56	0.1		
7:57	0.0	0.0	7:57	0.0	0.0	-
7:58	0.0	0.0	7:58	0.1	0.0	-
7:59	0.0	0.0	7:59	0.0	0.0	-
8:00	0.0	0.0	8:00	0.1	0.0	-
8:01	0.0	0.0	8:01	0.1	0.0	-
8:02	0.0	0.0	8:02	0.2	0.0	-
8:03	0.0	0.0	8:03	0.4	0.1	-
8:04	0.0	0.0	8:04	0.3	0.1	-
8:05	0.0	0.0	8:05	0.8	0.1	-
8:06	0.0	0.0	8:06	1.0	0.2	-
8:07	0.1	0.0	8:07	1.0	0.3	-
8:08	0.0	0.0	8:08	1.0	0.3	-
8:09	0.0	0.0	8:09	1.3	0.4	-
8:10	0.0	0.0	8:10	1.5	0.5	-
8:11	0.0	0.0	8:11	1.3	0.6	-
8:12	0.0	0.0	8:12	1.1	0.7	-
8:13	0.0	0.0	8:13	1.4	0.8	-
8:14	0.0	0.0	8:14	1.2	0.8	-
8:15	0.0	0.0	8:15	0.0	0.8	-
8:16	0.0	0.0	8:16	1.5	0.9	-
8:17	0.1	0.0	8:17	0.0	0.9	-
8:18	0.0	0.0	8:18	0.5	0.9	-
8:19	0.0	0.0	8:19	0.0	0.9	-
8:20	0.0	0.0	8:20	0.0	0.9	-
8:21	0.0	0.0	8:21	0.0	0.8	-
8:22	0.0	0.0	8:22	0.0	0.7	-
8:23	0.0	0.0	8:23	0.0	0.7	-
8:24	0.0	0.0	8:24	0.0	0.6	-
8:25	0.0	0.0	8:25	0.0	0.5	-
8:26	0.0	0.0	8:26	0.1	0.4	-
8:27	0.0	0.0	8:27	0.0	0.3	-
8:28	0.0	0.0	8:28	0.1	0.2	-
8:29	0.0	0.0	8:29	0.0	0.1	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
8:30	0.0	0.0	8:30	0.1	0.2	-
8:31	0.0	0.0	8:31	0.1	0.1	-
8:32	0.0	0.0	8:32	0.2	0.1	-
8:33	0.0	0.0	8:33	0.4	0.1	-
8:34	0.0	0.0	8:34	0.3	0.1	-
8:35	0.0	0.0	8:35	0.3	0.1	-
8:36	0.0	0.0	8:36	0.3	0.1	-
8:37	0.1	0.0	8:37	0.3	0.1	-
8:38	0.0	0.0	8:38	0.3	0.2	-
8:39	0.0	0.0	8:39	0.3	0.2	-
8:40	0.0	0.0	8:40	0.4	0.2	-
8:41	0.0	0.0	8:41	0.4	0.2	-
8:42	0.0	0.0	8:42	0.4	0.3	-
8:43	0.0	0.0	8:43	0.4	0.3	-
8:44	0.0	0.0	8:44	0.0	0.3	-
8:45	0.0	0.0	8:45	0.5	0.3	-
8:46	0.0	0.0	8:46	0.0	0.3	-
8:47	0.1	0.0	8:47	0.0	0.3	-
8:48	0.0	0.0	8:48	0.0	0.3	-
8:49	0.0	0.0	8:49	0.0	0.2	-
8:50	0.0	0.0	8:50	0.0	0.2	-
8:51	0.0	0.0	8:51	0.0	0.2	-
8:52	0.0	0.0	8:52	0.0	0.2	-
8:53	0.0	0.0	8:53	0.1	0.2	-
8:54	0.0	0.0	8:54	0.0	0.1	-
8:55	0.0	0.0	8:55	0.1	0.1	-
8:56	0.0	0.0	8:56	0.0	0.1	-
8:57	0.0	0.0	8:57	0.1	0.1	-
8:58	0.0	0.0	8:58	0.1	0.1	-
8:59	0.0	0.0	8:59	0.2	0.1	-
9:00	0.0	0.0	9:00	0.4	0.1	-
9:01	0.0	0.0	9:01	0.3	0.1	-
9:02	0.0	0.0	9:02	0.3	0.1	-
9:03	0.0	0.0	9:03	0.3	0.1	-
9:04	0.0	0.0	9:04	0.3	0.1	-
9:05	0.0	0.0	9:05	0.3	0.2	-
9:06	0.0	0.0	9:06	0.3	0.2	-
9:07	0.1	0.0	9:07	0.0	0.2	-
9:08	0.0	0.0	9:08	0.5	0.2	-
9:09	0.0	0.0	9:09	0.0	0.2	-
9:10	0.0	0.0	9:10	0.0	0.2	-
9:11	0.0	0.0	9:11	0.0	0.2	-
9:12	0.0	0.0	9:12	0.0	0.2	-
9:13	0.0	0.0	9:13	0.0	0.2	-
9:14	0.0	0.0	9:14	0.0	0.2	-
9:15	0.0	0.0	9:15	0.0	0.2	-
9:16	0.0	0.0	9:16	0.1	0.1	-
9:17	0.1	0.0	9:17	0.0	0.1	-
9:18	0.0	0.0	9:18	0.1	0.1	-
9:19	0.0	0.0	9:19	0.0	0.1	-
9:20	0.0	0.0	9:20	0.1	0.1	-
9:21	0.0	0.0	9:21	0.1	0.1	-
9:22	0.0	0.0	9:22	0.2	0.1	-

PID DATA						
Upwind			**Downwind**			**Exceeds VOCs Alarm Limits**
Time	**VOC (ppm)**	**15-Minute Average**	**Time**	**VOC (ppm)**	**15-Minute Average**	
9:23	0.0	0.0	9:23	0.4	0.1	-
9:24	0.0	0.0	9:24	0.3	0.1	-
9:25	0.0	0.0	9:25	0.3	0.1	-
9:26	0.0	0.0	9:26	0.3	0.1	-
9:27	0.0	0.0	9:27	0.3	0.1	-
9:28	0.0	0.0	9:28	0.3	0.2	-
9:29	0.0	0.0	9:29	0.3	0.2	-
9:30	0.0	0.0	9:30	0.0	0.2	-
9:31	0.0	0.0	9:31	0.5	0.2	-
9:32	0.0	0.0	9:32	0.0	0.2	-
9:33	0.0	0.0	9:33	0.0	0.2	-
9:34	0.0	0.0	9:34	0.0	0.2	-
9:35	0.0	0.0	9:35	0.0	0.2	-
9:36	0.0	0.0	9:36	0.0	0.2	-
9:37	0.1	0.0	9:37	0.0	0.2	-
9:38	0.0	0.0	9:38	0.0	0.2	-
9:39	0.0	0.0	9:39	0.1	0.1	-
9:40	0.0	0.0	9:40	0.0	0.1	-
9:41	0.0	0.0	9:41	0.1	0.1	-
9:42	0.0	0.0	9:42	0.0	0.1	-
9:43	0.0	0.0	9:43	0.1	0.1	-
9:44	0.0	0.0	9:44	0.1	0.1	-
9:45	0.0	0.0	9:45	0.2	0.1	-
9:46	0.0	0.0	9:46	0.4	0.1	-
9:47	0.1	0.0	9:47	0.3	0.1	-
9:48	0.0	0.0	9:48	0.3	0.1	-
9:49	0.0	0.0	9:49	0.3	0.1	-
9:50	0.0	0.0	9:50	0.3	0.1	-
9:51	0.0	0.0	9:51	0.3	0.2	-
9:52	0.0	0.0	9:52	0.3	0.2	-
9:53	0.0	0.0	9:53	0.3	0.2	-
9:54	0.0	0.0	9:54	0.3	0.2	-
9:55	0.0	0.0	9:55	0.3	0.2	-
9:56	0.0	0.0	9:56	0.3	0.2	-
9:57	0.0	0.0	9:57	0.3	0.3	-
9:58	0.0	0.0	9:58	0.0	0.3	-
9:59	0.0	0.0	9:59	0.5	0.3	-
10:00	0.0	0.0	10:00	0.0	0.3	-
10:01	0.0	0.0	10:01	0.0	0.2	-
10:02	0.0	0.0	10:02	0.0	0.2	-
10:03	0.0	0.0	10:03	0.0	0.2	-
10:04	0.0	0.0	10:04	0.0	0.2	-
10:05	0.0	0.0	10:05	0.0	0.2	-
10:06	0.0	0.0	10:06	0.0	0.2	-
10:07	0.1	0.0	10:07	0.1	0.1	-
10:08	0.0	0.0	10:08	0.0	0.1	-
10:09	0.0	0.0	10:09	0.1	0.1	-
10:10	0.0	0.0	10:10	0.0	0.1	-
10:11	0.0	0.0	10:11	0.1	0.1	-
10:12	0.0	0.0	10:12	0.1	0.1	-
10:13	0.0	0.0	10:13	0.2	0.1	-
10:14	0.0	0.0	10:14	0.4	0.1	-
10:15	0.0	0.0	10:15	0.3	0.1	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
10:16	0.0	0.0	10:16	0.3	0.1	-
10:17	0.1	0.0	10:17	0.3	0.1	-
10:18	0.0	0.0	10:18	0.3	0.1	-
10:19	0.0	0.0	10:19	0.3	0.2	-
10:20	0.0	0.0	10:20	0.0	0.2	-
10:21	0.0	0.0	10:21	0.5	0.2	-
10:22	0.0	0.0	10:22	0.0	0.2	-
10:23	0.0	0.0	10:23	0.0	0.2	-
10:24	0.0	0.0	10:24	0.0	0.2	-
10:25	0.0	0.0	10:25	0.0	0.2	-
10:26	0.0	0.0	10:26	0.0	0.2	-
10:27	0.0	0.0	10:27	0.0	0.2	-
10:28	0.0	0.0	10:28	0.0	0.2	-
10:29	0.0	0.0	10:29	0.1	0.1	-
10:30	0.0	0.0	10:30	0.0	0.1	-
10:31	0.0	0.0	10:31	0.1	0.1	-
10:32	0.0	0.0	10:32	0.0	0.1	-
10:33	0.0	0.0	10:33	0.1	0.1	-
10:34	0.0	0.0	10:34	0.1	0.1	-
10:35	0.0	0.0	10:35	0.2	0.1	-
10:36	0.0	0.0	10:36	0.4	0.1	-
10:37	0.1	0.0	10:37	0.3	0.1	-
10:38	0.0	0.0	10:38	0.3	0.1	-
10:39	0.0	0.0	10:39	0.3	0.1	-
10:40	0.0	0.0	10:40	0.3	0.1	-
10:41	0.0	0.0	10:41	0.3	0.2	-
10:42	0.0	0.0	10:42	0.0	0.2	-
10:43	0.0	0.0	10:43	0.5	0.2	-
10:44	0.0	0.0	10:44	0.0	0.2	-
10:45	0.0	0.0	10:45	0.0	0.2	-
10:46	0.0	0.0	10:46	0.0	0.2	-
10:47	0.1	0.0	10:47	0.0	0.2	-
10:48	0.0	0.0	10:48	0.0	0.2	-
10:49	0.0	0.0	10:49	0.0	0.2	-
10:50	0.0	0.0	10:50	0.0	0.2	-
10:51	0.0	0.0	10:51	0.1	0.1	-
10:52	0.0	0.0	10:52	0.0	0.1	-
10:53	0.0	0.0	10:53	0.1	0.1	-
10:54	0.0	0.0	10:54	0.0	0.1	-
10:55	0.0	0.0	10:55	0.1	0.1	-
10:56	0.0	0.0	10:56	0.1	0.1	-
10:57	0.0	0.0	10:57	0.2	0.1	-
10:58	0.0	0.0	10:58	0.4	0.1	-
10:59	0.0	0.0	10:59	0.0	0.1	-
11:00	0.0	0.0	11:00	0.1	0.1	-
11:01	0.0	0.0	11:01	0.0	0.1	-
11:02	0.0	0.0	11:02	0.1	0.1	-
11:03	0.0	0.0	11:03	0.1	0.1	-
11:04	0.0	0.0	11:04	0.2	0.1	-
11:05	0.0	0.0	11:05	0.4	0.1	-
11:06	0.0	0.0	11:06	0.3	0.1	-
11:07	0.1	0.0	11:07	0.3	0.2	-
11:08	0.0	0.0	11:08	0.3	0.2	-

<table>
<tr><th colspan="7">PID DATA</th></tr>
<tr><th colspan="3">Upwind</th><th colspan="3">Downwind</th><th rowspan="2">Exceeds VOCs Alarm Limits</th></tr>
<tr><th>Time</th><th>VOC (ppm)</th><th>15-Minute Average</th><th>Time</th><th>VOC (ppm)</th><th>15-Minute Average</th></tr>
<tr><td>11:09</td><td>0.0</td><td>0.0</td><td>11:09</td><td>0.3</td><td>0.2</td><td>-</td></tr>
<tr><td>11:10</td><td>0.0</td><td>0.0</td><td>11:10</td><td>0.3</td><td>0.2</td><td>-</td></tr>
<tr><td>11:11</td><td>0.0</td><td>0.0</td><td>11:11</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:12</td><td>0.0</td><td>0.0</td><td>11:12</td><td>0.5</td><td>0.2</td><td>-</td></tr>
<tr><td>11:13</td><td>0.0</td><td>0.0</td><td>11:13</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:14</td><td>0.0</td><td>0.0</td><td>11:14</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:15</td><td>0.0</td><td>0.0</td><td>11:15</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:16</td><td>0.0</td><td>0.0</td><td>11:16</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:17</td><td>0.0</td><td>0.0</td><td>11:17</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:18</td><td>0.0</td><td>0.0</td><td>11:18</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:19</td><td>0.0</td><td>0.0</td><td>11:19</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:20</td><td>0.0</td><td>0.0</td><td>11:20</td><td>0.1</td><td>0.1</td><td>-</td></tr>
<tr><td>11:21</td><td>0.0</td><td>0.0</td><td>11:21</td><td>0.0</td><td>0.1</td><td>-</td></tr>
<tr><td>11:22</td><td>0.0</td><td>0.0</td><td>11:22</td><td>0.1</td><td>0.1</td><td>-</td></tr>
<tr><td>11:23</td><td>0.0</td><td>0.0</td><td>11:23</td><td>0.0</td><td>0.1</td><td>-</td></tr>
<tr><td>11:24</td><td>0.0</td><td>0.0</td><td>11:24</td><td>0.1</td><td>0.1</td><td>-</td></tr>
<tr><td>11:25</td><td>0.0</td><td>0.0</td><td>11:25</td><td>0.1</td><td>0.1</td><td>-</td></tr>
<tr><td>11:26</td><td>0.0</td><td>0.0</td><td>11:26</td><td>0.2</td><td>0.1</td><td>-</td></tr>
<tr><td>11:27</td><td>0.0</td><td>0.0</td><td>11:27</td><td>0.4</td><td>0.1</td><td>-</td></tr>
<tr><td>11:28</td><td>0.0</td><td>0.0</td><td>11:28</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:29</td><td>0.0</td><td>0.0</td><td>11:29</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:30</td><td>0.0</td><td>0.0</td><td>11:30</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:31</td><td>0.0</td><td>0.0</td><td>11:31</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:32</td><td>0.0</td><td>0.0</td><td>11:32</td><td>0.3</td><td>0.2</td><td>-</td></tr>
<tr><td>11:33</td><td>0.0</td><td>0.0</td><td>11:33</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:34</td><td>0.0</td><td>0.0</td><td>11:34</td><td>0.5</td><td>0.2</td><td>-</td></tr>
<tr><td>11:35</td><td>0.0</td><td>0.0</td><td>11:35</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:36</td><td>0.0</td><td>0.0</td><td>11:36</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:37</td><td>0.0</td><td>0.0</td><td>11:37</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:38</td><td>0.0</td><td>0.0</td><td>11:38</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:39</td><td>0.0</td><td>0.0</td><td>11:39</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:40</td><td>0.0</td><td>0.0</td><td>11:40</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:41</td><td>0.0</td><td>0.0</td><td>11:41</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:42</td><td>0.0</td><td>0.0</td><td>11:42</td><td>0.1</td><td>0.1</td><td>-</td></tr>
<tr><td>11:43</td><td>0.0</td><td>0.0</td><td>11:43</td><td>0.0</td><td>0.1</td><td>-</td></tr>
<tr><td>11:44</td><td>0.0</td><td>0.0</td><td>11:44</td><td>0.1</td><td>0.1</td><td>-</td></tr>
<tr><td>11:45</td><td>0.0</td><td>0.0</td><td>11:45</td><td>0.1</td><td>0.1</td><td>-</td></tr>
<tr><td>11:46</td><td>0.0</td><td>0.0</td><td>11:46</td><td>0.2</td><td>0.1</td><td>-</td></tr>
<tr><td>11:47</td><td>0.0</td><td>0.0</td><td>11:47</td><td>0.4</td><td>0.1</td><td>-</td></tr>
<tr><td>11:48</td><td>0.0</td><td>0.0</td><td>11:48</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:49</td><td>0.0</td><td>0.0</td><td>11:49</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:50</td><td>0.0</td><td>0.0</td><td>11:50</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:51</td><td>0.0</td><td>0.0</td><td>11:51</td><td>0.3</td><td>0.1</td><td>-</td></tr>
<tr><td>11:52</td><td>0.0</td><td>0.0</td><td>11:52</td><td>0.3</td><td>0.2</td><td>-</td></tr>
<tr><td>11:53</td><td>0.0</td><td>0.0</td><td>11:53</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:54</td><td>0.0</td><td>0.0</td><td>11:54</td><td>0.5</td><td>0.2</td><td>-</td></tr>
<tr><td>11:55</td><td>0.0</td><td>0.0</td><td>11:55</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:56</td><td>0.0</td><td>0.0</td><td>11:56</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:57</td><td>0.0</td><td>0.0</td><td>11:57</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:58</td><td>0.0</td><td>0.0</td><td>11:58</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>11:59</td><td>0.0</td><td>0.0</td><td>11:59</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>12:00</td><td>0.0</td><td>0.0</td><td>12:00</td><td>0.0</td><td>0.2</td><td>-</td></tr>
<tr><td>12:01</td><td>0.0</td><td>0.0</td><td>12:01</td><td>0.0</td><td>0.2</td><td>-</td></tr>
</table>

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
12:02	0.0	0.0	12:02	0.1	0.1	-
12:03	0.0	0.0	12:03	0.0	0.1	-
12:04	0.0	0.0	12:04	0.1	0.1	-
12:05	0.0	0.0	12:05	0.0	0.1	-
12:06	0.0	0.0	12:06	0.1	0.1	-
12:07	0.0	0.0	12:07	0.1	0.1	-
12:08	0.0	0.0	12:08	0.2	0.1	-
12:09	0.0	0.0	12:09	0.4	0.1	-
12:10	0.0	0.0	12:10	0.3	0.1	-
12:11	0.0	0.0	12:11	0.3	0.1	-
12:12	0.0	0.0	12:12	0.3	0.1	-
12:13	0.0	0.0	12:13	0.3	0.1	-
12:14	0.0	0.0	12:14	0.3	0.2	-
12:15	0.0	0.0	12:15	0.0	0.2	-
12:16	0.0	0.0	12:16	0.5	0.2	-
12:17	0.0	0.0	12:17	0.0	0.2	-
12:18	0.0	0.0	12:18	0.0	0.2	-
12:19	0.0	0.0	12:19	0.0	0.2	-
12:20	0.0	0.0	12:20	0.0	0.2	-
12:21	0.0	0.0	12:21	0.0	0.2	-
12:22	0.0	0.0	12:22	0.0	0.2	-
12:23	0.0	0.0	12:23	0.0	0.2	-
12:24	0.0	0.0	12:24	0.1	0.1	-
12:25	0.0	0.0	12:25	0.0	0.1	-
12:26	0.0	0.0	12:26	0.1	0.1	-
12:27	0.0	0.0	12:27	0.1	0.1	-
12:28	0.0	0.0	12:28	0.2	0.1	-
12:29	0.0	0.0	12:29	0.4	0.1	-
12:30	0.0	0.0	12:30	0.3	0.1	-
12:31	0.0	0.0	12:31	0.3	0.1	-
12:32	0.0	0.0	12:32	0.3	0.1	-
12:33	0.0	0.0	12:33	0.3	0.1	-
12:34	0.0	0.0	12:34	0.3	0.2	-
12:35	0.0	0.0	12:35	0.0	0.2	-
12:36	0.0	0.0	12:36	0.5	0.2	-
12:37	0.0	0.0	12:37	0.0	0.2	-
12:38	0.0	0.0	12:38	0.0	0.2	-
12:39	0.0	0.0	12:39	0.0	0.2	-
12:40	0.0	0.0	12:40	0.0	0.2	-
12:41	0.0	0.0	12:41	0.0	0.2	-
12:42	0.0	0.0	12:42	0.0	0.2	-
12:43	0.0	0.0	12:43	0.0	0.2	-
12:44	0.0	0.0	12:44	0.1	0.1	-
12:45	0.0	0.0	12:45	0.0	0.1	-
12:46	0.0	0.0	12:46	0.1	0.1	-
12:47	0.0	0.0	12:47	0.0	0.1	-
12:48	0.0	0.0	12:48	0.1	0.1	-
12:49	0.0	0.0	12:49	0.1	0.1	-
12:50	0.0	0.0	12:50	0.2	0.1	-
12:51	0.0	0.0	12:51	0.4	0.1	-
12:52	0.0	0.0	12:52	0.3	0.1	-
12:53	0.0	0.0	12:53	0.3	0.1	-
12:54	0.0	0.0	12:54	0.3	0.1	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
12:55	0.0	0.0	12:55	0.3	0.1	-
12:56	0.0	0.0	12:56	0.3	0.2	-
12:57	0.0	0.0	12:57	0.0	0.2	-
12:58	0.0	0.0	12:58	0.5	0.2	-
12:59	0.0	0.0	12:59	0.0	0.2	-
13:00	0.0	0.0	13:00	0.0	0.2	-
13:01	0.0	0.0	13:01	0.0	0.2	-
13:02	0.0	0.0	13:02	0.0	0.2	-
13:03	0.0	0.0	13:03	0.0	0.2	-
13:04	0.0	0.0	13:04	0.0	0.2	-
13:05	0.0	0.0	13:05	0.0	0.2	-
13:06	0.0	0.0	13:06	0.1	0.1	-
13:07	0.0	0.0	13:07	0.0	0.1	-
13:08	0.0	0.0	13:08	0.1	0.1	-
13:09	0.0	0.0	13:09	0.1	0.1	-
13:10	0.0	0.0	13:10	0.2	0.1	-
13:11	0.0	0.0	13:11	0.4	0.1	-
13:12	0.0	0.0	13:12	0.3	0.1	-
13:13	0.0	0.0	13:13	0.3	0.1	-
13:14	0.0	0.0	13:14	0.3	0.1	-
13:15	0.0	0.0	13:15	0.3	0.1	-
13:16	0.0	0.0	13:16	0.3	0.2	-
13:17	0.0	0.0	13:17	0.0	0.2	-
13:18	0.0	0.0	13:18	0.5	0.2	-
13:19	0.0	0.0	13:19	0.0	0.2	-
13:20	0.0	0.0	13:20	0.0	0.2	-
13:21	0.0	0.0	13:21	0.0	0.2	-
13:22	0.0	0.0	13:22	0.0	0.2	-
13:23	0.0	0.0	13:23	0.0	0.2	-
13:24	0.0	0.0	13:24	0.0	0.2	-
13:25	0.0	0.0	13:25	0.0	0.2	-
13:26	0.0	0.0	13:26	0.1	0.1	-
13:27	0.0	0.0	13:27	0.0	0.1	-
13:28	0.0	0.0	13:28	0.1	0.1	-
13:29	0.0	0.0	13:29	0.0	0.1	-
13:30	0.0	0.0	13:30	0.1	0.1	-
13:31	0.0	0.0	13:31	0.1	0.1	-
13:32	0.0	0.0	13:32	0.2	0.1	-
13:33	0.0	0.0	13:33	0.4	0.1	-
13:34	0.0	0.0	13:34	0.3	0.1	-
13:35	0.0	0.0	13:35	0.3	0.1	-
13:36	0.0	0.0	13:36	0.3	0.1	-
13:37	0.0	0.0	13:37	0.3	0.1	-
13:38	0.0	0.0	13:38	0.3	0.2	-
13:39	0.0	0.0	13:39	0.0	0.2	-
13:40	0.0	0.0	13:40	0.5	0.2	-
13:41	0.0	0.0	13:41	0.0	0.2	-
13:42	0.0	0.0	13:42	0.0	0.2	-
13:43	0.0	0.0	13:43	0.0	0.2	-
13:44	0.0	0.0	13:44	0.0	0.2	-
13:45	0.0	0.0	13:45	0.0	0.2	-
13:46	0.0	0.0	13:46	0.0	0.2	-
13:47	0.0	0.0	13:47	0.0	0.2	-

PID DATA						
Upwind			Downwind			Exceeds VOCs Alarm Limits
Time	VOC (ppm)	15-Minute Average	Time	VOC (ppm)	15-Minute Average	
13:48	0.0	0.0	13:48	0.1	0.1	-
13:49	0.0	0.0	13:49	0.0	0.1	-
13:50	0.0	0.0	13:50	0.1	0.1	-
13:51	0.0	0.0	13:51	0.1	0.1	-
13:52	0.0	0.0	13:52	0.2	0.1	-
13:53	0.0	0.0	13:53	0.4	0.1	-
13:54	0.0	0.0	13:54	0.3	0.1	-
13:55	0.0	0.0	13:55	0.3	0.1	-
13:56	0.0	0.0	13:56	0.3	0.1	-
13:57	0.0	0.0	13:57	0.3	0.1	-
13:58	0.0	0.0	13:58	0.3	0.2	-
13:59	0.0	0.0	13:59	0.0	0.2	-
14:00	0.0	0.0	14:00	0.5	0.2	-
14:01	0.0	0.0	14:01	0.0	0.2	-
14:02	0.0	0.0	14:02	0.0	0.2	-
14:03	0.0	0.0	14:03	0.0	0.2	-
14:04	0.0	0.0	14:04	0.0	0.2	-
14:05	0.0	0.0	14:05	0.0	0.2	-
14:06	0.0	0.0	14:06	0.0	0.2	-
14:07	0.0	0.0	14:07	0.0	0.2	-
14:08	0.0	0.0	14:08	0.1	0.1	-
14:09	0.0	0.0	14:09	0.0	0.1	-
14:10	0.0	0.0	14:10	0.1	0.1	-
14:11	0.0	0.0	14:11	0.0	0.1	-
14:12	0.0	0.0	14:12	0.1	0.1	-
14:13	0.0	0.0	14:13	0.1	0.1	-
14:14	0.0	0.0	14:14	0.2	0.1	-
14:15	0.0	0.0	14:15	0.4	0.1	-
14:16	0.0	0.0	14:16	0.3	0.1	-
14:17	0.0	0.0	14:17	0.3	0.1	-
14:18	0.0	0.0	14:18	0.3	0.1	-
14:19	0.0	0.0	14:19	0.3	0.1	-
14:20	0.0	0.0	14:20	0.3	0.2	-
14:21	0.0	0.0	14:21	0.0	0.2	-
14:22			14:22	0.5	0.2	
14:23			14:23	0.0	0.2	
14:24			14:24	0.0	0.2	
14:25			14:25	0.0	0.2	
14:26			14:26	0.0	0.2	
14:27			14:27	0.0	0.2	
14:28			14:28	0.0	0.2	

Appendix G

Data Usability Summary Report

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

Technical Memorandum

2700 Kelly Road, Suite 200 Warrington, PA 18976 T: 215.491.6500 F: 215.491.6501
Mailing Address: P.O. Box 1569 Doylestown, PA 18901

To: Kimberly Nagotko, Staff Geologist

From: Emily Strake, Langan Senior Project Chemist/Risk Assessor

Date: January 11, 2018

Re: Data Usability Summary Report
For 215 North 10th Street
Brooklyn, New York
Soil Samples Collected November 2017
Langan Project No.: 170482201

This memorandum presents the findings of an analytical data validation of the data generated from the analysis of soil samples collected on November 20 and 21, 2017 by Langan Engineering and Environmental Services ("Langan") at 215 N. 10th Street located in Brooklyn, New York. The samples were analyzed by Alpha Analytical located in Westborough, MA (NYSDOH ELAP registration # 11148) for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, herbicides, metals including mercury, hexavalent chromium, cyanide and percent solids using the analytical methods specified below.

- VOCs by SW-846 Method 8260C
- SVOCs by SW-846 Method 8270D
- Pesticides by SW-846 Method 8081B
- PCBs by SW-846 Method 8082A
- Herbicides by SW-846 Method 8151A
- Metals by SW-846 Method 6010C
- Mercury (Hg) by SW-846 Method 7471B
- Hexavalent chromium (CrVI) by SW-846 Method 7196A
- Cyanide (CN) by SW-846 9010C/9012B
- Percent solids by SM2540G

Table 1, below, summarizes the laboratory and client sample identification numbers, sample collection dates, and analytical parameters subject to review.

TABLE 1: SAMPLE SUMMARY

SDG	Lab Sample ID	Client Sample ID	Sample Date	Analytical Parameters
L1743026	L1743026-01	16B3_0-2	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-02	16B3_7-8	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-03	16B3_10.5-11.5	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-04	16B3_10-10.5	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-05	16B4_3-4	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-06	16B4_11-12	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-07	16B4_14.5-15	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-08	16B6_3-4	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-09	16B6_10-11	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-10	16B6_14.5-15	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-11	SODUP02_112117	11/21/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1743026	L1743026-12	TB03_112117	11/21/17	VOCs
L1742789	L1742789-01	16B8_5.5-6.5	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-02	16B8_0-2	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-03	16B8_11-12	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-04	16B8_14-15	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-05	16B7_6.5-7.5	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-06	16B7_11-12	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-07	16B11_7-8	11/20/17	VOCs, SVOCs, PCBs, Pesticides, Herbicides, TPH, Metals, Hg, CrVI, CN, %S

SDG	Lab Sample ID	Client Sample ID	Sample Date	Analytical Parameters
L1742789	L1742789-08	16B5_14-15	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-09	16B10_11-12	11/20/17	VOCs, SVOCs, PCBs, Pesticides, Herbicides, TPH, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-10	16B2_11-12	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-11	16B1_14-15	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-12	16B1_0-2	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-13	16B5_12-13	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-14	16B2_13-14	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-15	16B1_11-12	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-16	16B1_7-8	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-17	16B9_10-11	11/20/17	VOCs, SVOCs, PCBs, Pesticides, Herbicides, TPH, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-18	SODUP01_112017	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-19	16B2_14-15	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-20	16B2_7-8	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-21	16B10_7-8	11/20/17	VOCs, SVOCs, PCBs, Pesticides, Herbicides, TPH, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-22	16B5_4.5-5	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-23	16B1_4.5-5.5	11/20/17	VOCs, SVOCs, Metals, Hg, CrVI, CN, %S
L1742789	L1742789-24	TB01_112017	11/20/17	VOCs
L1742789	L1742789-25	TB02_112017	11/20/17	VOCs

VALIDATION OVERVIEW

This data validation was performed in accordance with USEPA Region II Standard Operating Procedure (SOP) #HW-34a, "Trace Volatile Data Validation" (September 2016, Revision 1), USEPA Region II SOP #HW-33A, "Low/Medium Volatile Data Validation" (September 2016, Revision 1), USEPA Region II SOP #HW-35A, "Semivolatile Data Validation" (September 2016, Revision 1), USEPA Region II SOP #HW-36A, "Pesticide Data Validation" (October 2016, Revision 1), USEPA Region II SOP HW-37A, "PCB Aroclor Data Validation" (June 2015, Revision 0), USEPA Region II SOP HW-17, "Validating Chlorinated Herbicides" (USEPA Region II SOP #HW-3a, "ICP-AES Data Validation" (September 2016, Revision 1), USEPA Region II SOP #HW-3C, "Mercury and Cyanide Data Validation" (September 2016, Revision 1), the USEPA Contract Laboratory Program "National Functional Guidelines for Organic Superfund Methods Data Review" (EPA-540-R-2017-002, January 2017), USEPA "National Functional Guidelines for Inorganic Superfund Methods Data Review" (EPA-540-R-2017-001, January 2017) and the specifics of the methods employed.

Validation includes evaluation of the analytical data to verify that data are easily traceable and sufficiently complete to permit logical reconstruction by a qualified individual other than the originator. Items subject to review in this memorandum include holding times, sample preservation, sample extraction, sample digestion, instrument tuning, instrument calibration, laboratory blanks, laboratory control samples, system monitoring compounds, internal standard area counts, CRDL standards, ICP interference check samples, serial dilutions, matrix spike/spike duplicate recoveries, interference check samples, laboratory duplicates, field duplicates, trip blanks, target compound identification and quantification, chromatograms, and overall system performance.

As a result of the review process, the following qualifiers may be assigned to the data in accordance with the USEPA's guidelines and best professional judgment:

R – The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.

U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

NJ – The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

If any validation qualifiers are assigned these qualifiers supersede any laboratory-applied qualifiers. Data that is not qualified as a result of this data validation is considered acceptable on the basis of the items subject to review. Data that is qualified as "R" are not sufficiently valid and technically supportable to be used for data interpretation. Data that is otherwise qualified due to minor data quality anomalies are usable, as qualified.

TABLE 2: VALIDATOR-APPLIED QUALIFICATION

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
16B3_0-2	6010C	CADMIUM, TOTAL	7440-43-9	J
16B3_0-2	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B3_0-2	6010C	IRON, TOTAL	7439-89-6	J
16B3_0-2	6010C	LEAD, TOTAL	7439-92-1	J
16B3_0-2	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B3_0-2	6010C	ZINC, TOTAL	7440-66-6	J
16B3_0-2	SW7196A	CHROMIUM, HEXAVALENT	18540-29-9	UJ
16B3_0-2	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B3_0-2	SW8260C	2-BUTANONE	78-93-3	UJ
16B3_0-2	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B3_0-2	SW8260C	BROMOFORM	75-25-2	UJ
16B3_0-2	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B3_0-2	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B3_0-2	SW8270D	4-CHLOROANILINE	106-47-8	UJ
16B3_0-2	SW8270D	BENZOIC ACID	65-85-0	UJ
16B3_0-2	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B3_7-8	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B3_7-8	6010C	IRON, TOTAL	7439-89-6	J
16B3_7-8	6010C	LEAD, TOTAL	7439-92-1	J
16B3_7-8	6010C	MAGNESIUM, TOTAL	7439-95-4	J

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
16B3_7-8	6010C	ZINC, TOTAL	7440-66-6	J
16B3_7-8	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B3_7-8	SW8260C	2-BUTANONE	78-93-3	UJ
16B3_7-8	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B3_7-8	SW8260C	BROMOFORM	75-25-2	UJ
16B3_7-8	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B3_7-8	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B3_7-8	SW8270D	BENZOIC ACID	65-85-0	UJ
16B3_7-8	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B3_10.5-11.5	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B3_10.5-11.5	6010C	IRON, TOTAL	7439-89-6	J
16B3_10.5-11.5	6010C	LEAD, TOTAL	7439-92-1	J
16B3_10.5-11.5	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B3_10.5-11.5	6010C	ZINC, TOTAL	7440-66-6	J
16B3_10.5-11.5	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B3_10.5-11.5	SW8260C	2-BUTANONE	78-93-3	UJ
16B3_10.5-11.5	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B3_10.5-11.5	SW8260C	BROMOFORM	75-25-2	UJ
16B3_10.5-11.5	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B3_10.5-11.5	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B3_10.5-11.5	SW8270D	BENZOIC ACID	65-85-0	UJ
16B3_10.5-11.5	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B4_3-4	6010C	ARSENIC, TOTAL	7440-38-2	J
16B4_3-4	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B4_3-4	6010C	COPPER, TOTAL	7440-50-8	J
16B4_3-4	6010C	IRON, TOTAL	7439-89-6	J
16B4_3-4	6010C	LEAD, TOTAL	7439-92-1	J
16B4_3-4	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B4_3-4	6010C	ZINC, TOTAL	7440-66-6	J
16B4_3-4	SW7471B	MERCURY, TOTAL	7439-97-6	J
16B4_3-4	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B4_3-4	SW8260C	2-BUTANONE	78-93-3	UJ

Project Sample ID	*Analysis*	*Analyte*	*CAS No.*	*Validator Qualifier*
16B4_3-4	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B4_3-4	SW8260C	BROMOFORM	75-25-2	UJ
16B4_3-4	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B4_3-4	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B4_3-4	SW8260C	NAPHTHALENE	91-20-3	UJ
16B4_3-4	SW8260C	TETRACHLOROETHENE	127-18-4	J
16B4_3-4	SW8260C	TRICHLOROETHENE	79-01-6	J
16B4_3-4	SW8260C	CIS-1,2-DICHLOROETHENE	156-59-2	J
16B4_3-4	SW8270D	4-CHLOROANILINE	106-47-8	UJ
16B4_3-4	SW8270D	ACENAPHTHENE	83-32-9	J
16B4_3-4	SW8270D	ANTHRACENE	120-12-7	J
16B4_3-4	SW8270D	BENZO(A)ANTHRACENE	56-55-3	J
16B4_3-4	SW8270D	BENZO(A)PYRENE	50-32-8	J
16B4_3-4	SW8270D	BENZO(B)FLUORANTHENE	205-99-2	J
16B4_3-4	SW8270D	BENZO(GHI)PERYLENE	191-24-2	J
16B4_3-4	SW8270D	BENZO(K)FLUORANTHENE	207-08-9	J
16B4_3-4	SW8270D	BENZOIC ACID	65-85-0	UJ
16B4_3-4	SW8270D	CHRYSENE	218-01-9	J
16B4_3-4	SW8270D	DIBENZO(A,H)ANTHRACENE	53-70-3	J
16B4_3-4	SW8270D	FLUORANTHENE	206-44-0	J
16B4_3-4	SW8270D	INDENO(1,2,3-CD)PYRENE	193-39-5	J
16B4_3-4	SW8270D	PHENANTHRENE	85-01-8	J
16B4_3-4	SW8270D	PYRENE	129-00-0	J
16B4_3-4	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B4_11-12	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B4_11-12	6010C	IRON, TOTAL	7439-89-6	J
16B4_11-12	6010C	LEAD, TOTAL	7439-92-1	J
16B4_11-12	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B4_11-12	6010C	ZINC, TOTAL	7440-66-6	J
16B4_11-12	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B4_11-12	SW8260C	2-BUTANONE	78-93-3	UJ
16B4_11-12	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
16B4_11-12	SW8260C	BROMOFORM	75-25-2	UJ
16B4_11-12	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B4_11-12	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B4_11-12	SW8270D	BENZOIC ACID	65-85-0	UJ
16B4_11-12	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B4_14.5-15	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B4_14.5-15	6010C	IRON, TOTAL	7439-89-6	J
16B4_14.5-15	6010C	LEAD, TOTAL	7439-92-1	J
16B4_14.5-15	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B4_14.5-15	6010C	ZINC, TOTAL	7440-66-6	J
16B4_14.5-15	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B4_14.5-15	SW8260C	2-BUTANONE	78-93-3	J
16B4_14.5-15	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B4_14.5-15	SW8260C	BROMOFORM	75-25-2	UJ
16B4_14.5-15	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B4_14.5-15	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B4_14.5-15	SW8270D	BENZOIC ACID	65-85-0	UJ
16B4_14.5-15	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B6_3-4	6010C	ARSENIC, TOTAL	7440-38-2	J
16B6_3-4	6010C	CADMIUM, TOTAL	7440-43-9	J
16B6_3-4	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B6_3-4	6010C	COBALT, TOTAL	7440-48-4	J
16B6_3-4	6010C	IRON, TOTAL	7439-89-6	J
16B6_3-4	6010C	LEAD, TOTAL	7439-92-1	J
16B6_3-4	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B6_3-4	6010C	POTASSIUM, TOTAL	9/7/7440	J
16B6_3-4	6010C	THALLIUM, TOTAL	7440-28-0	UJ
16B6_3-4	6010C	VANADIUM, TOTAL	7440-62-2	J
16B6_3-4	6010C	ZINC, TOTAL	7440-66-6	J
16B6_3-4	SW7196A	CHROMIUM, HEXAVALENT	18540-29-9	UJ
16B6_3-4	SW8270D	BENZOIC ACID	65-85-0	UJ
16B6_3-4	SW9012B	CYANIDE, TOTAL	57-12-5	J

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
16B6_10-11	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B6_10-11	6010C	IRON, TOTAL	7439-89-6	J
16B6_10-11	6010C	LEAD, TOTAL	7439-92-1	J
16B6_10-11	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B6_10-11	6010C	ZINC, TOTAL	7440-66-6	J
16B6_10-11	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B6_10-11	SW8260C	2-BUTANONE	78-93-3	J
16B6_10-11	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B6_10-11	SW8260C	BROMOFORM	75-25-2	UJ
16B6_10-11	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B6_10-11	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B6_10-11	SW8270D	BENZOIC ACID	65-85-0	UJ
16B6_10-11	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B6_14.5-15	6010C	CHROMIUM, TOTAL	7440-47-3	J
16B6_14.5-15	6010C	IRON, TOTAL	7439-89-6	J
16B6_14.5-15	6010C	LEAD, TOTAL	7439-92-1	J
16B6_14.5-15	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B6_14.5-15	6010C	ZINC, TOTAL	7440-66-6	J
16B6_14.5-15	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B6_14.5-15	SW8260C	2-BUTANONE	78-93-3	J
16B6_14.5-15	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B6_14.5-15	SW8260C	BROMOFORM	75-25-2	UJ
16B6_14.5-15	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B6_14.5-15	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B6_14.5-15	SW8270D	BENZOIC ACID	65-85-0	UJ
16B6_14.5-15	SW9012B	CYANIDE, TOTAL	57-12-5	J
SODUP02_112117	6010C	ANTIMONY, TOTAL	7440-36-0	J
SODUP02_112117	6010C	ARSENIC, TOTAL	7440-38-2	J
SODUP02_112117	6010C	CHROMIUM, TOTAL	7440-47-3	J
SODUP02_112117	6010C	COPPER, TOTAL	7440-50-8	J
SODUP02_112117	6010C	IRON, TOTAL	7439-89-6	J
SODUP02_112117	6010C	LEAD, TOTAL	7439-92-1	J

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
SODUP02_112117	6010C	MAGNESIUM, TOTAL	7439-95-4	J
SODUP02_112117	6010C	ZINC, TOTAL	7440-66-6	J
SODUP02_112117	SW7471B	MERCURY, TOTAL	7439-97-6	J
SODUP02_112117	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
SODUP02_112117	SW8260C	BROMOFORM	75-25-2	UJ
SODUP02_112117	SW8260C	CARBON DISULFIDE	75-15-0	UJ
SODUP02_112117	SW8260C	NAPHTHALENE	91-20-3	J
SODUP02_112117	SW8260C	TETRACHLOROETHENE	127-18-4	J
SODUP02_112117	SW8260C	TRICHLOROETHENE	79-01-6	J
SODUP02_112117	SW8260C	CIS-1,2-DICHLOROETHENE	156-59-2	J
SODUP02_112117	SW8260C	P-ISOPROPYLTOLUENE	99-87-6	J
SODUP02_112117	SW8270D	ACENAPHTHENE	83-32-9	J
SODUP02_112117	SW8270D	ANTHRACENE	120-12-7	J
SODUP02_112117	SW8270D	BENZO(A)ANTHRACENE	56-55-3	J
SODUP02_112117	SW8270D	BENZO(A)PYRENE	50-32-8	J
SODUP02_112117	SW8270D	BENZO(B)FLUORANTHENE	205-99-2	J
SODUP02_112117	SW8270D	BENZO(GHI)PERYLENE	191-24-2	J
SODUP02_112117	SW8270D	BENZO(K)FLUORANTHENE	207-08-9	J
SODUP02_112117	SW8270D	CHRYSENE	218-01-9	J
SODUP02_112117	SW8270D	DIBENZO(A,H)ANTHRACENE	53-70-3	J
SODUP02_112117	SW8270D	FLUORANTHENE	206-44-0	J
SODUP02_112117	SW8270D	INDENO(1,2,3-CD)PYRENE	193-39-5	J
SODUP02_112117	SW8270D	PHENANTHRENE	85-01-8	J
SODUP02_112117	SW8270D	PYRENE	129-00-0	J
SODUP02_112117	SW9012B	CYANIDE, TOTAL	57-12-5	J
TB03_112117	SW8260C	1,2,4,5-TETRAMETHYLBENZENE	95-93-2	U (2)
TB03_112117	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
TB03_112117	SW8260C	NAPHTHALENE	91-20-3	UJ
16B8_5.5-6.5	6010C	ALUMINUM, TOTAL	7429-90-5	J
16B8_5.5-6.5	6010C	ARSENIC, TOTAL	7440-38-2	J
16B8_5.5-6.5	6010C	BARIUM, TOTAL	7440-39-3	J
16B8_5.5-6.5	6010C	CADMIUM, TOTAL	7440-43-9	J

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
16B8_5.5-6.5	6010C	CALCIUM, TOTAL	7440-70-2	J
16B8_5.5-6.5	6010C	COPPER, TOTAL	7440-50-8	J
16B8_5.5-6.5	6010C	MAGNESIUM, TOTAL	7439-95-4	J
16B8_5.5-6.5	6010C	MANGANESE, TOTAL	7439-96-5	J
16B8_5.5-6.5	6010C	NICKEL, TOTAL	7440-02-0	J
16B8_5.5-6.5	6010C	POTASSIUM, TOTAL	9/7/7440	J
16B8_5.5-6.5	6010C	SILVER, TOTAL	7440-22-4	J
16B8_5.5-6.5	6010C	SODIUM, TOTAL	7440-23-5	J
16B8_5.5-6.5	6010C	VANADIUM, TOTAL	7440-62-2	J
16B8_5.5-6.5	6010C	ZINC, TOTAL	7440-66-6	J
16B8_5.5-6.5	SW7471B	MERCURY, TOTAL	7439-97-6	J
16B8_5.5-6.5	SW8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UJ
16B8_5.5-6.5	SW8260C	2-BUTANONE	78-93-3	UJ
16B8_5.5-6.5	SW8260C	BROMODICHLOROMETHANE	75-27-4	UJ
16B8_5.5-6.5	SW8260C	BROMOFORM	75-25-2	UJ
16B8_5.5-6.5	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B8_5.5-6.5	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B8_5.5-6.5	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B8_0-2	SW8260C	BROMOFORM	75-25-2	UJ
16B8_0-2	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B8_0-2	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B8_0-2	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B8_11-12	SW8260C	BROMOFORM	75-25-2	UJ
16B8_11-12	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B8_11-12	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B8_11-12	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B8_14-15	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B7_6.5-7.5	SW8260C	ACROLEIN	107-02-8	UJ
16B7_6.5-7.5	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B7_11-12	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B11_7-8	SW7196A	CHROMIUM, HEXAVALENT	18540-29-9	UJ
16B11_7-8	SW9012B	CYANIDE, TOTAL	57-12-5	J

Project Sample ID	*Analysis*	*Analyte*	*CAS No.*	*Validator Qualifier*
16B5_14-15	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B2_11-12	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B1_14-15	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B1_0-2	SW8260C	BROMOFORM	75-25-2	UJ
16B1_0-2	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B1_0-2	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B1_0-2	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B5_12-13	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B2_13-14	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B1_11-12	SW8270D	PHENOL	108-95-2	J
16B1_11-12	SW9012B	CYANIDE, TOTAL	57-12-5	J
16B1_7-8	SW8260C	BROMOFORM	75-25-2	UJ
16B1_7-8	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B1_7-8	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B1_7-8	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B9_10-11	SW7196A	CHROMIUM, HEXAVALENT	18540-29-9	UJ
16B9_10-11	SW8260C	BROMOFORM	75-25-2	UJ
16B9_10-11	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B9_10-11	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B9_10-11	SW8270D	BENZOIC ACID	65-85-0	UJ
16B9_10-11	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
SODUP01_112017	SW7196A	CHROMIUM, HEXAVALENT	18540-29-9	UJ
SODUP01_112017	SW8270D	BENZOIC ACID	65-85-0	UJ
SODUP01_112017	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B2_14-15	SW8270D	BENZOIC ACID	65-85-0	UJ
16B2_14-15	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B2_7-8	SW8260C	BROMOFORM	75-25-2	UJ
16B2_7-8	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B2_7-8	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B2_7-8	SW8270D	BENZOIC ACID	65-85-0	UJ
16B2_7-8	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B10_7-8	SW7196A	CHROMIUM, HEXAVALENT	18540-29-9	UJ

Project Sample ID	Analysis	Analyte	CAS No.	Validator Qualifier
16B10_7-8	SW8260C	BROMOFORM	75-25-2	UJ
16B10_7-8	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B10_7-8	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B10_7-8	SW8270D	BENZOIC ACID	65-85-0	UJ
16B10_7-8	SW9012B	CYANIDE, TOTAL	57-12-5	UJ
16B5_4.5-5	SW8260C	BROMOFORM	75-25-2	UJ
16B5_4.5-5	SW8260C	CARBON DISULFIDE	75-15-0	UJ
16B5_4.5-5	SW8260C	DIBROMOCHLOROMETHANE	124-48-1	UJ
16B5_4.5-5	SW8270D	BENZOIC ACID	65-85-0	UJ
16B5_4.5-5	SW9012B	CYANIDE, TOTAL	57-12-5	J
TB01_112017	SW8260C	1,2,4,5-TETRAMETHYLBENZENE	95-93-2	U (2)
TB01_112017	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	UJ
TB01_112017	SW8260C	CHLOROETHANE	75-00-3	UJ
TB01_112017	SW8260C	NAPHTHALENE	91-20-3	U (2.5)
TB02_112017	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	UJ
TB02_112017	SW8260C	CHLOROETHANE	75-00-3	UJ
TB02_112017	SW8260C	NAPHTHALENE	91-20-3	UJ

MAJOR DEFICIENCIES:

Major deficiencies include those that grossly impact data quality and necessitate the rejection of results. The section below describes the major deficiencies that were identified.

VOCs by USEPA Method 8260C:

2-Chloroethylvinyl ether was submitted to the laboratory as preserved. 2-Chloroethylvinyl ether is an acid-labile compound that will not recover in the presence of hydrochloric acid. The associated trip blank sample results are qualified as "R".

MINOR DEFICIENCIES:

Minor deficiencies include anomalies that directly impact data quality and necessitate qualification, but do not result in unusable data. The section below describes the minor deficiencies that were identified.

VOCs by USEPA Method 8260C:

Method blank sample WG1067184-5 displayed positive detections for naphthalene and 1,2,4,5-tetramethylbenzene. The associated positive trip blank sample results are qualified as "U" at the reporting limit.

LCS/LCSD WG1066730-3/4 displayed recoveries less than the lower control limit for dibromochloromethane at 60% and 59%, bromodichloromethane at 68% and 66%, bromoform at 50% and 50%, carbon disulfide at 43% an 43%, 2-butanone at 61% and 64%, and 1,2-dibromo-3-chloropropane at 66% and 67%. The associated sample results are qualified as estimated.

LCS/LCSD WG1066890-3/4 displayed recoveries less than the lower control limit for dibromochloromethane at 60% and 59%, bromodichloromethane at 68% and 66%, bromoform at 50% and 50%, carbon disulfide at 43% an 43%, 2-butanone at 61% and 64%, and 1,2-dibromo-3-chloropropane at 66% and 67%. The associated sample results are qualified as estimated.

LCS/LCSD WG1066890-8/9 displayed recoveries less than the lower control limit for bromoform at 65% and 64%, respectively. The associated sample result is qualified as "UJ."

LCS/LCSD WG1067184-3/4 displayed a recovery less than the lower control limit for naphthalene at 63%. The associated sample result is qualified as "UJ."

The continuing calibration analyzed on 11/28/17 displayed %Ds greater than the control limit for carbon disulfide at 57.1%, bromodichloromethane at 32.1%, and bromoform at 49.8%. The associated sample results are qualified as "UJ."

LCS/LCSD WG1066657-3/4 displayed recoveries less than the lower control limit for carbon disulfide (51% and 48%), dibromochloromethane (68% and 68%), and bromoform (58% and 57%). The associated sample results were non-detect and are qualified as "UJ."

LCS/LCSD WG1066890-3/4 displayed recoveries less than the lower control limit for 1,2-dibromo-3-chloropropane at 66% and 67%, carbon disulfide at 43% and 43%, 2-butanone at 61% and 64%, dibromochloromethane at 60% and 59%, bromodichloromethane at 68% and 66%, and bromoform at 50% and 50%. The associated sample results were non-detect and are qualified as "UJ."

LCS/LCSD WG1067196-3/4 displayed recoveries less than the lower control limit for 2-CEVE at 39% and 26%, and naphthalene at 68%. The 2-CEVE LCS/LCSD RPD was greater than the control limit at 40%. The associated sample results are qualified as "UJ." The LCS/LCSD also displayed recoveries greater than the upper control limit for chloromethane, vinyl chloride and chloroethane. The associated sample results were non-detect; qualification is not necessary.

LCS/LCSD WG1070220-3/4 displayed recoveries less than the lower control limit for acrolein at 55% and 55%. The associated sample result was non-detect and is qualified as "UJ."

Method blank sample WG1067196-5 displayed positive detections for naphthalene at 0.76 ug/L and 1,2,4,5-tetramethylbenzene at 0.55 ug/L. The associated positive trip blank sample results are qualified as "U" at the reporting limit.

The continuing calibration analyzed on VOA105 on 11/28/17 displayed a %D greater than the control limit for chloroethane at 33.8%. The associated sample results are qualified as "UJ."

SVOCs by USEPA Method 8270D:

LCS/LCSD WG1066213-2/3 displayed recoveries outside of control limits for 4-chloroaniline at 40% and 38%, 4-nitrophenol at 120% and 116%, phenol at 95% and 92%, benzoic acid at 0% and 0%, and caprolactam at 152% and 145%. The associated non-detect sample results for benzoic acid and 4-chloroaniline are qualified as "UJ."

LCS/LCSD WG1066267-2/3 displayed recoveries outside of control limits for benzoic acid at 0%and 0%, and phenol at 92%. The associated sample results for benzoic acid are qualified as "UJ."

LCS/LCSD WG1066103-2/3 displayed recoveries greater than the upper control limits for p-chloro-m-cresol (112% and 105%), 4-nitrophenol (133% and 128%), phenol (104% and 103%), and caprolactam (175% and 163%). The associated positive sample results are qualified as "J."

LCS/LCSD WG1066132-2/3 did not recover for benzoic acid. The associated sample results are qualified as "UJ."

Metals by USEPA Method 6010C:

ICP serial dilution sample 16B3_0-2 displayed %Ds greater than the control limit for iron and zinc at 13% and 13%, respectively. The associated sample results are qualified as "J."

ICP serial dilution sample 16B3_3-4 displayed %Ds greater than the control limit for chromium, iron, magnesium, and zinc at 11%, 17%, 16%, and 11%, respectively. The associated sample results are qualified as "J."

Laboratory duplicate sample WG1069894-4 displayed a RPD greater than the control limit for lead at 29%. The associated sample results are qualified as estimated.

MS/MSD sample 16B3_0-2 displayed recoveries outside of control limits for cadmium at 26% and 37%, and magnesium at 73%. The associated sample results are qualified as estimated.

MS/MSD sample 16B6_3-4 displayed recoveries outside of control limits for arsenic, cadmium, chromium, cobalt, magnesium, potassium thallium and vanadium. The associated sample results are qualified as estimated.

Laboratory duplicate sample 16B8_5.5-6.5 displayed RPDs greater than the control limit for aluminum (21%), barium (44%), cadmium (64%), calcium (123%), copper (67%), magnesium (33%), manganese (33%), nickel (46%), silver (52%), sodium (36%), vanadium (26%), and zinc (45%). The associated sample results are qualified as "J."

MS/SD sample 16B_5.5-6.5 displayed recoveries outside of control limits for arsenic (128%), barium (128%), cadmium (199%), manganese (379%), nickel (221%), and potassium (132%). The associated sample results are qualified as "J."

Mercury by USEPA Method 7471A:

The laboratory duplicate RPD for sample 16B8_5.5-6.5 was greater than the control limit (i.e., 20%) at 26%. The associated sample results are qualified as estimated.

Cyanide by USEPA Method 9012B:

MS/MSD sample 16B6_3-4 displayed a recovery less than the lower control limit at 57%. The associated sample results are qualified as estimated.

LCS/LCSD WG1066789-2/3 displayed a recovery less than the lower control limit at 73%. The associated sample results are qualified as estimated.

LCS/LCSD WG1069408-2/3 displayed a recovery less than the lower control limit at 70%. The associated sample results are qualified as estimated.

LCS/LCSD WG1065183-2/3 displayed a recovery less than the lower control limit at 75%. The associated sample results are qualified as estimated.

LCS/LCSD WG1066111-2/3 displayed a recovery less than the lower control limit at 77%. The associated sample results are qualified as estimated.

LCS/LCSD WG1066112-2/3 displayed a recovery less than the lower control limit at 76%. The associated sample results are qualified as estimated.

LCS/LCSD WG1069408-2/3 displayed a recovery less than the lower control limit at 70%. The associated sample results are qualified as estimated.

Sample 16B7_6.5-7.5 was analyzed outside of the method required holding time. The associated sample result is qualified as "UJ."

Hexavalent Chromium by USEPA Method 7196A:

MS/MSD sample 16B6_3-4 did not recover for CrVI. The associated sample result is qualified as "UJ."

MS/MSD sample 16B3_0-2 displayed recoveries less than the lower control limit at 10% and 56%. In addition, the MS/MSD RPD was greater than the control limit at 125%. The associated sample result is qualified as "UJ."

MS sample 16B10_7-8 did not recover for CrVI. The associated sample result is qualified as "UJ."

MS sample SODUP01_112017 displayed a recovery less than the lower control limit at 7%. The associated sample result is qualified as "UJ."

LCS WG1065483-2 displayed a recovery less than the lower control limit at 79%. The associated sample results are qualified as "UJ."

OTHER DEFICIENCIES:

Other deficiencies include anomalies that do not directly impact data quality and do not necessitate qualification. The section below describes the other deficiencies that were identified.

VOCs by USEPA Method 8260C:

Sample 16B3_7-8 displayed a surrogate recovery greater than the upper control limit for 4-bromofluorobenzene at 201%. The remaining three volatile surrogates recovered within control; qualification is not necessary.

LCS/LCSD WG1066956-3/4 displayed a recovery greater than the upper control limit for 1,4-dioxane at 137%. The associated sample result was non-detect; no qualification is required.

LCS/LCSD WG1067184-3/4 displayed recoveries and RPDs outside of control limits for 2-CEVE. The trip blank sample result was previously rejected; no further action is necessary. In addition, the LCS/LCSD RPD for 1,2,3-trichlorobenzene was greater than the control limit. The associated sample result was non-detect; qualification is not necessary.

MS/MSD sample 16B6_3-4 displayed recoveries outside of control limits for trichlorofluoromethane at 41% and 38%, bromomethane at 54%, chloroethane at 45% and 46%, acrylonitrile at 136% and 136%, and TBA at 135% and 141%. Data is not qualified on the basis of MS/MSD recoveries alone.

MS/MSD sample 16B3_0-2 displayed recoveries outside of control limits for chloromethane at 132% and 136%, and chloroethane at 27% and 27%. Data is not qualified on the basis of MS/MSD recoveries alone.

Sample 16B1_11-12 displayed a recovery greater than the upper control limit for 4-bromofluorobenzene at 144%. The remaining three volatile surrogates recovered within control; qualification is not necessary.

LCSD WG1066654-4 displayed a recovery greater than the upper control limit for TBA. The associated sample results were non-detect; qualification is not required.

Trip blank samples TB01_112017 and TB02_112017 displayed positive detections for unknown TICs. Data is not qualified on the basis of TIC contamination.

Method blank sample WG1066657-5 displayed positive detections for an unknown TIC and hexamethylcyclotrisiloxane in the TIC scan. Method blank WG1067196-5 displayed a positive detection for an unknown TIC. Data is not qualified on the basis of TIC contamination.

Method blank sample WG1070220-5 displayed a positive detection for bromomethane. The associated sample results were non-detect; qualification is not required.

The continuing calibration analyzed on VOA110 displayed %Ds greater than the control limit for bromodichloromethane, bromoform and carbon disulfide. The associated sample results were previously qualified on the basis of LCS/LCSD recoveries; no further action is necessary.

SVOCs by USEPA Method 8270D:

MS/MSD sample 16B3_0-2 did not recover (i.e., 0%) for benzidine, 3,3'-dichlorobenzidine, hexachlorocyclopentadiene, 4,6-dinitro-o-cresol, 2,4-dinitrophenol, and benzoic acid. In addition, the recoveries were outside of control limits for caprolactam at 140% and 140%, 4-nitroanilne at 18% and 33%, 3-nitroaniline at 22%, 4-chloroaniline at 19% and 22%, and pyrene at 32%. The MS/MSD RPDs for fluoranthene (55%), pyrene (51%), 3-nitroaniline (57%), and 4-nitroaniline (58%) were greater than the control limit (i.e., 50%). Data is not qualified on the basis of MS/MSD recoveries or RPDs alone.

MS/MSD sample 16B3_3-4 did not recover for benzidine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and benzoic acid. In addition, the recoveries were outside of control limits for 3,3'-dichlorobenzidine at 16% and 26%, fluoranthene at 6% and 0%, B(a)A at 27% and 27%, B(a)P at 34%, B(b)F at 24% and 30%, chrysene at 25% and 31%, pyrene at 6% and 0%, 4-chloroaniline at 25% and 36%, and 4,6-dinitro-o-cresol at 0% and 6%. Data is not qualified on the basis of MS/MSD recoveries or RPDs alone.

Sample 16B1_7-8 displayed a surrogate recovery greater than the upper control limit for base/neutral extractable nitrobenzene-d5 at 125%. The remaining two base/neutral surrogates recovered within control; qualification is not necessary.

EPH by NJDEP EPH:

MS sample WG1066148-4 displayed a recovery greater than the upper control limit for total EPH at 192%. The spiked volume did not originate from the site; qualification is not necessary.

Pesticides by SW-846 Method 8081B:

Sample 16B11_7-8 displayed a surrogate recovery greater than the upper control limit at 1694%. The associated sample results were non-detect; qualification is not necessary.

PCBs by SW-846 Method 8082A:

Sample 16B11_7-8 displayed a surrogate recovery less than the lower control limit for TCX on the secondary chromatography column at 29%. The sample results were reported from the primary column; qualification is not necessary.

Metals by USEPA Method 6010C:

Preparation blank sample WG1069894-1 displayed a positive detection for iron at 0.54 mg/kg. The associated sample results were orders of magnitude greater than the blank amount; qualification is not necessary.

Mercury by USEPA Method 7471A:

Sample 16B8_5.5-6.5 did not recover for mercury. The sample concentration was greater than 4X the spiked amount; qualification is not required.

MS sample WG1069466-3 displayed a recovery greater than the upper control limit at 138%. The spiked volume did not originate from the site; qualification is not necessary.

COMMENTS:

Two field duplicate and parent sample pairs (SODUP01_112017 from 16B5_12-13, and SODUP02_112117 from 16B4_3-4) were analyzed for the analytical parameters listed in the sample summary. The sample results meet the precision criteria if results greater than five times the reporting limit (RL) exhibit an RPD less than or equal to fifty percent. If the result is less than five times the RL, the absolute difference between the two results must be less than 2X the RL. The following analytes did not meet the precision criteria:

- SODUP01_112017 from 16B5_12-13: none.
- SODUP02_112117 and 16B4_3-4: anthracene, PCE, pyrene, cis-1,2-DCE, B(ghi)P, Indeno(123-cd)pyrene, B(b)F, fluoranthene, B(k)F, chrysene, B(a)P, Dibzeno(a,h)anthracene, B(a)A, iron, lead, mercury, antimony, arsenic, copper, TCE, acenaphthene, phenanthrene, naphthalene (as VOC), p-isopropyltoluene.

On the basis of this evaluation, the laboratory appears to have followed the specified analytical methods with the exception of errors discussed above. If a given fraction is not mentioned above, that means that all specified criteria were met for that parameter. All laboratory data packages met ASP Category B requirements and all sample holding times were met.

All data are considered usable, as qualified, with the exception of 2-CEVE results. In addition, completeness, defined as the percentage of analytical results that are judged to be valid, is 99%.

Signed:

Emily Strake

Emily Strake, CEP
Senior Project Chemist/Risk Assessor

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

Technical Memorandum

2700 Kelly Road, Suite 200 Warrington, PA 18976 T: 215.491.6500 F: 215.491.6501
Mailing Address: P.O. Box 1569 Doylestown, PA 18901

To: Kimberly Nagotko, Staff Geologist

From: Emily Strake, Langan Senior Project Chemist/Risk Assessor

Date: January 11, 2018

Re: Data Usability Summary Report
For 215 North 10th Street
Brooklyn, New York
Groundwater Samples Collected November 2017
Langan Project No.: 170482201

This memorandum presents the findings of an analytical data validation of the data generated from the analysis of groundwater samples collected on November 29, 2017 by Langan Engineering and Environmental Services ("Langan") at 215 N. 10th Street located in Brooklyn, New York. The samples were analyzed by Alpha Analytical located in Westborough, MA (NYSDOH ELAP registration # 11148) for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals including mercury, and cyanide using the analytical methods specified below.

- VOCs by SW-846 Method 8260C
- SVOCs by SW-846 Method 8270D & 8270D Selective Ion Monitoring (SIM)
- Metals by SW-846 Method 6020A
- Mercury (Hg) by SW-846 Method 7470A
- Cyanide (CN) by SW-846 9010C/9012B

Table 1, below, summarizes the laboratory and client sample identification numbers, sample collection dates, and analytical parameters subject to review.

TABLE 1: SAMPLE SUMMARY

SDG	*Lab Sample ID*	*Client Sample ID*	*Sample Date*	*Analytical Parameters*
L1743740	L1743740-01	MW3_112917	11/29/17	VOCs, SVOCs, Metals, Hg, CN
L1743740	L1743740-02	16MW3_112917	11/29/17	VOCs, SVOCs, Metals, Hg, CN
L1743740	L1743740-03	16MW2_112917	11/29/17	VOCs, SVOCs, Metals, Hg, CN
L1743740	L1743740-04	16MW1_112917	11/29/17	VOCs, SVOCs, Metals, Hg, CN

SDG	Lab Sample ID	Client Sample ID	Sample Date	Analytical Parameters
L1743740	L1743740-05	GWDUP01_112917	11/29/17	VOCs, SVOCs, Metals, Hg, CN
L1743740-06	L1743740-06	MW4_112917	11/29/17	VOCs, SVOCs, Metals, Hg, CN
L1743740-08	L1743740-08	TB04_112917	11/29/17	VOCs
L1743740-08	L1743740-08	TB05_112917	11/29/17	VOCs

VALIDATION OVERVIEW

This data validation was performed in accordance with USEPA Region II Standard Operating Procedure (SOP) #HW-34a, “Trace Volatile Data Validation” (September 2016, Revision 1), USEPA Region II SOP #HW-33A, “Low/Medium Volatile Data Validation” (September 2016, Revision 1), USEPA Region II SOP #HW-35A, “Semivolatile Data Validation” (September 2016, Revision 1), USEPA Region II SOP #HW-3b, “ICP-MS Data Validation” (September 2016, Revision 1), USEPA Region II SOP #HW-3c, “Mercury and Cyanide Data Validation” (September 2016, Revision 1), the USEPA Contract Laboratory Program “National Functional Guidelines for Organic Superfund Methods Data Review” (EPA-540-R-2017-002, January 2017), USEPA “National Functional Guidelines for Inorganic Superfund Methods Data Review” (EPA-540-R-2017-001, January 2017) and the specifics of the methods employed.

Validation includes evaluation of the analytical data to verify that data are easily traceable and sufficiently complete to permit logical reconstruction by a qualified individual other than the originator. Items subject to review in this memorandum include holding times, sample preservation, sample extraction, sample digestion, instrument tuning, instrument calibration, laboratory blanks, laboratory control samples, system monitoring compounds, internal standard area counts, CRDL standards, ICP interference check samples, serial dilutions, matrix spike/spike duplicate recoveries, interference check samples, laboratory duplicates, field duplicates, trip blanks, target compound identification and quantification, chromatograms, and overall system performance.

As a result of the review process, the following qualifiers may be assigned to the data in accordance with the USEPA’s guidelines and best professional judgment:

R – The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

J – The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The analyte was not detected at a level greater than or equal to the reporting limit (RL); however, the reported RL is approximate and may be inaccurate or imprecise.

U – The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the RL or the sample concentration for results impacted by blank contamination.

NJ – The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

If any validation qualifiers are assigned these qualifiers supersede any laboratory-applied qualifiers. Data that is not qualified as a result of this data validation is considered acceptable on the basis of the items subject to review. Data that is qualified as "R" are not sufficiently valid and technically supportable to be used for data interpretation. Data that is otherwise qualified due to minor data quality anomalies are usable, as qualified.

TABLE 2: VALIDATOR-APPLIED QUALIFICATION

Project Sample ID	*Analysis*	*Analyte*	*CAS No.*	*Validator Qualifier*
MW3_112917	6020A	ANTIMONY, TOTAL	7440-36-0	U (0.004)
MW3_112917	6020A	CHROMIUM, DISSOLVED	7440-47-3	U (0.001)
MW3_112917	6020A	MAGNESIUM, TOTAL	7439-95-4	J
MW3_112917	6020A	SODIUM, DISSOLVED	7440-23-5	J
MW3_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
MW3_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
MW3_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
MW3_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
MW3_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
MW3_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ
MW3_112917	SW8270D	2,6-DINITROTOLUENE	606-20-2	UJ
MW3_112917	SW8270D	2-NITROANILINE	88-74-4	UJ
MW3_112917	SW8270D	2-NITROPHENOL	88-75-5	UJ
MW3_112917	SW8270D	BIS(2-CHLOROETHYL)ETHER	111-44-4	UJ
MW3_112917	SW8270D	BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	U (3)
MW3_112917	SW8270D	CAPROLACTAM	105-60-2	UJ
MW3_112917	SW8270D	HEXACHLOROCYCLOPENTADIENE	77-47-4	UJ
16MW3_112917	6020A	ANTIMONY, TOTAL	7440-36-0	U (0.004)

Project Sample ID	Analysis	Analyte	CAS No.	Validator Qualifier
16MW3_112917	6020A	CHROMIUM, DISSOLVED	7440-47-3	U (0.001)
16MW3_112917	6020A	MAGNESIUM, TOTAL	7439-95-4	J
16MW3_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
16MW3_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
16MW3_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
16MW3_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
16MW3_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
16MW3_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ
16MW3_112917	SW8270D	2,6-DINITROTOLUENE	606-20-2	UJ
16MW3_112917	SW8270D	2-NITROANILINE	88-74-4	UJ
16MW3_112917	SW8270D	2-NITROPHENOL	88-75-5	UJ
16MW3_112917	SW8270D	BIS(2-CHLOROETHYL)ETHER	111-44-4	UJ
16MW3_112917	SW8270D	BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	U (3)
16MW3_112917	SW8270D	CAPROLACTAM	105-60-2	UJ
16MW3_112917	SW8270D	HEXACHLOROCYCLOPENTADIENE	77-47-4	UJ
16MW2_112917	6020A	ALUMINUM, TOTAL	7429-90-5	J
16MW2_112917	6020A	ANTIMONY, TOTAL	7440-36-0	U (0.004)
16MW2_112917	6020A	ARSENIC, TOTAL	7440-38-2	J
16MW2_112917	6020A	CHROMIUM, DISSOLVED	7440-47-3	J
16MW2_112917	6020A	CHROMIUM, TOTAL	7440-47-3	J
16MW2_112917	6020A	COBALT, TOTAL	7440-48-4	J
16MW2_112917	6020A	COPPER, TOTAL	7440-50-8	J
16MW2_112917	6020A	LEAD, TOTAL	7439-92-1	J
16MW2_112917	6020A	MAGNESIUM, TOTAL	7439-95-4	J
16MW2_112917	SW7470A	MERCURY, TOTAL	7439-97-6	J
16MW2_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
16MW2_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
16MW2_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
16MW2_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
16MW2_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
16MW2_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
16MW2_112917	SW8270D	2,6-DINITROTOLUENE	606-20-2	UJ
16MW2_112917	SW8270D	2-NITROANILINE	88-74-4	UJ
16MW2_112917	SW8270D	2-NITROPHENOL	88-75-5	UJ
16MW2_112917	SW8270D	BIS(2-CHLOROETHYL)ETHER	111-44-4	UJ
16MW2_112917	SW8270D	BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	U (3)
16MW2_112917	SW8270D	CAPROLACTAM	105-60-2	UJ
16MW2_112917	SW8270D	HEXACHLOROCYCLOPENTADIENE	77-47-4	UJ
16MW1_112917	6020A	CHROMIUM, DISSOLVED	7440-47-3	U (0.001)
16MW1_112917	6020A	MAGNESIUM, TOTAL	7439-95-4	J
16MW1_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
16MW1_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
16MW1_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
16MW1_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
16MW1_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
16MW1_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ
16MW1_112917	SW8270D	2,6-DINITROTOLUENE	606-20-2	UJ
16MW1_112917	SW8270D	2-NITROANILINE	88-74-4	UJ
16MW1_112917	SW8270D	2-NITROPHENOL	88-75-5	UJ
16MW1_112917	SW8270D	BENZOIC ACID	65-85-0	J
16MW1_112917	SW8270D	BIPHENYL	92-52-4	J
16MW1_112917	SW8270D	BIS(2-CHLOROETHYL)ETHER	111-44-4	UJ
16MW1_112917	SW8270D	CAPROLACTAM	105-60-2	UJ
16MW1_112917	SW8270D	HEXACHLOROCYCLOPENTADIENE	77-47-4	UJ
GWDUP01_112917	6020A	ALUMINUM, TOTAL	7429-90-5	J
GWDUP01_112917	6020A	ANTIMONY, TOTAL	7440-36-0	U (0.004)
GWDUP01_112917	6020A	ARSENIC, TOTAL	7440-38-2	J
GWDUP01_112917	6020A	CHROMIUM, DISSOLVED	7440-47-3	U (0.001)
GWDUP01_112917	6020A	CHROMIUM, TOTAL	7440-47-3	J
GWDUP01_112917	6020A	COBALT, TOTAL	7440-48-4	J
GWDUP01_112917	6020A	COPPER, TOTAL	7440-50-8	J
GWDUP01_112917	6020A	LEAD, TOTAL	7439-92-1	J

Project Sample ID	*Analysis*	*Analyte*	*CAS No.*	*Validator Qualifier*
GWDUP01_112917	6020A	MAGNESIUM, TOTAL	7439-95-4	J
GWDUP01_112917	SW7470A	MERCURY, TOTAL	7439-97-6	J
GWDUP01_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
GWDUP01_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
GWDUP01_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
GWDUP01_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
GWDUP01_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
GWDUP01_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ
GWDUP01_112917	SW8270D	HEXACHLOROCYCLOPENTADIENE	77-47-4	UJ
MW4_112917	6020A	CHROMIUM, DISSOLVED	7440-47-3	U (0.001)
MW4_112917	6020A	MAGNESIUM, TOTAL	7439-95-4	J
MW4_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
MW4_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
MW4_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
MW4_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
MW4_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
MW4_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ
MW4_112917	SW8270D	2,6-DINITROTOLUENE	606-20-2	UJ
MW4_112917	SW8270D	2-NITROANILINE	88-74-4	UJ
MW4_112917	SW8270D	2-NITROPHENOL	88-75-5	UJ
MW4_112917	SW8270D	BIS(2-CHLOROETHYL)ETHER	111-44-4	UJ
MW4_112917	SW8270D	BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	U (3)
MW4_112917	SW8270D	CAPROLACTAM	105-60-2	UJ
MW4_112917	SW8270D	HEXACHLOROCYCLOPENTADIENE	77-47-4	UJ
TB04_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
TB04_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
TB04_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
TB04_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
TB04_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
TB04_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ

Project Sample ID	***Analysis***	***Analyte***	***CAS No.***	***Validator Qualifier***
TB05_112917	SW8260C	2-CHLOROETHYLVINYL ETHER	110-75-8	R
TB05_112917	SW8260C	BROMOMETHANE	74-83-9	UJ
TB05_112917	SW8260C	CARBON TETRACHLORIDE	56-23-5	UJ
TB05_112917	SW8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UJ
TB05_112917	SW8260C	TERT-BUTYL ALCOHOL	75-65-0	UJ
TB05_112917	SW8260C	TRICHLOROFLUOROMETHANE	75-69-4	UJ

MAJOR DEFICIENCIES:

Major deficiencies include those that grossly impact data quality and necessitate the rejection of results. The section below describes the major deficiencies that were identified.

VOCs by USEPA Method 8260C:

2-Chloroethylvinyl ether was submitted to the laboratory as preserved. 2-Chloroethylvinyl ether is an acid-labile compound that will not recover in the presence of hydrochloric acid. The associated sample results are qualified as “R”.

MINOR DEFICIENCIES:

Minor deficiencies include anomalies that directly impact data quality and necessitate qualification, but do not result in unusable data. The section below describes the minor deficiencies that were identified.

VOCs by USEPA Method 8260C:

LCS/LCSD WG1068796-3/4 displayed recoveries greater than the upper control limit for TBA at 152% and 162%. The associated sample results were non-detect; qualification is not necessary. The LCS/LCSD also displayed recoveries less than the lower control limit for Freon-113 at 68% and 68%. The associated sample results were non-detect and are qualified as “UJ.”

The continuing calibration analyzed on 12/4/17 at 08:35 displayed %Ds greater than the control limit for carbon tetrachloride at 25.6%, Freon-113 at 31.7%, trichlorofluoromethane at 30.8%, and bromomethane at 36.1%. The associated sample results are qualified as estimated.

SVOCs by USEPA Method 8270D:

LCS/LCSD WG1068326-2/3 displayed recoveries less than the lower control limit for hexachlorocyclopentadiene at 35% and 32%. The associated sample results were non-detect and are qualified as "UJ."

Sample 16MW1_112917 displayed a recovery greater than the upper control limit for surrogate 2,4,6-tribromophenol at 125%. The associated positive detections for acid-extractable compounds are qualified as "J."

Method blank sample WG1068326-1 displayed a positive detection for DEHP at 2.1 μg/L. The associated positive detections are qualified as "U" at the reporting limit.

The continuing calibration analyzed on 12/3/17 at 16:32 displayed %Ds greater than the control limit for bis(2-chloroethyl)ether at 27.9%, 2-nitrophenol at 22.9%, 2-nitroaniline at 25.3%, 2,6-dinitrotoluene at 23.4%, and caprolactam at 64.7%. The associated sample results are qualified as estimated.

Metals by USEPA Method 6020A:

Preparation blank sample WG1068406-1 displayed positive detections for dissolved chromium and sodium at 0.00025 mg/L and 0.0721 mg/L, respectively. The associated sample results are qualified as "U" at the reporting limit.

Preparation blank sample WG1068128-1 displayed a positive detection for total antimony at 0.00047 mg/L. The associated positive detections are qualified as "U" at the reporting limit.

MS sample MW3_112917 displayed a recovery greater than the upper control limit at 127%. The associated positive detection is qualified as "J."

ICP serial dilution sample MW3_112917 displayed a %D greater than the control limit at 11%. The associated positive sample results are qualified as "J."

OTHER DEFICIENCIES:

Other deficiencies include anomalies that do not directly impact data quality and do not necessitate qualification. The section below describes the other deficiencies that were identified.

VOCs by USEPA Method 8260C:

MS/MSD sample MW3_112917 displayed recoveries outside of control limits for 2-CEVE, TBA, acetone, 2-butanone, and 1,4-dioxane. In addition, the MS/MSD RPDs were greater than the control limit for 1,4-dioxane, TBA and bromomethane. Data is not qualified on the basis of MS/MSD recoveries or RPDs alone.

SVOCs by USEPA Method 8270D:

MS/MSD sample MW3_112917 displayed recoveries outside of control limits for benzidine, 3,3'-dichlorobenzidene, hexachlorocyclopentadiene, and 4-nitrophenol. Data is not qualified on the basis of MS/MSD recoveries or RPDs alone.

SVOCs by USEPA Method 8270D SIM:

MS/MSD sample MW3_112917 displayed recoveries outside of control limits for hexachloroethane at 38% and 35%. Data is not qualified on the basis of MS/MSD recoveries alone.

COMMENTS:

One field duplicate and parent sample pair (GWDUP01_112917 and 16MW2_112917) was analyzed for the analytical parameters listed in the sample summary. The sample results meet the precision criteria if results greater than five times the reporting limit (RL) exhibit an RPD less than or equal to thirty percent. If the result is less than five times the RL, the absolute difference between the two results must be less than the RL. The following analytes did not meet the precision criteria: total aluminum, lead, mercury, arsenic, chromium, cobalt and copper, and dissolved chromium.

On the basis of this evaluation, the laboratory appears to have followed the specified analytical methods with the exception of errors discussed above. If a given fraction is not mentioned above, that means that all specified criteria were met for that parameter. All laboratory data packages met ASP Category B requirements and all sample holding times were met.

All data are considered usable, as qualified, with the exception of 2-CEVE results. In addition, completeness, defined as the percentage of analytical results that are judged to be valid, is 99%.

Signed:

Emily Strake

Emily Strake, CEP
Senior Project Chemist/Risk Assessor

Appendix H

Laboratory Data Reports

Appendix I

Completed Fish and Wildlife Resources Impact Analysis Decision Key

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