REMEDIAL INVESTIGATION REPORT

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
DER-10	New York State Department of Environmental Conservation Technical Guide 10
FID	Flame Ionization Detector
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IRM	Interim Remedial Measure
NAPL	Non-aqueous Phase Liquid
NYC VCP	New York City Voluntary Cleanup Program
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYS DOH ELAP	New York State Department of Health Environmental Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
QEP	Qualified Environmental Professional
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCO	Soil Cleanup Objective
SPEED	Searchable Property Environmental Electronic Database

CERTIFICATION

I, Joel B. Landes am a Qualified Environmental Professional, as defined in RCNY § 43-1402(ar). I have primary direct responsibility for implementation of the Remedial Investigation for the Riverside Center Site, (NYCOER VCP Site No. 13CVCP106M). I am responsible for the content of this Remedial Investigation Report (RIR), have reviewed its contents and certify that this RIR is accurate to the best of my knowledge and contains all available environmental information and data regarding the property.

Qualified Environmental Professional Date Signature

EXECUTIVE SUMMARY

The Remedial Investigation Report (RIR) provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy pursuant to the Rules of the City of New York (RCNY)§ 43-1407(f). The remedial investigation (RI) described in this document is consistent with applicable guidance.

Site Location and Current Usage

The Site is located at 507-515 West 28th Street, New York, New York and is in the West Chelsea section of Manhattan. The Site is identified as Block 700, Lots 27, 32, 34, 38, 42, 44 and 45 on the New York City Tax Map (Figure 1). The Site has an area of approximately 39,500 square feet and is bounded by West 29th Street to the north, West 28th Street to the south, 10th Avenue to the east, and the Avalon development and a two-story masonry building to the west. A map showing the regional location of the Site is provided as Figure 2.

Currently, a portion of the Site is being used as a grade-level asphalt paved commercial parking lot. All other structures that exist on the remaining portions of the Site are being demolished. The entrance to the commercial parking lot is located along 10th Avenue. The elevated High Line Park roughly transects the Site in a north-south orientation.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site consists of a mixed-use residential and commercial development with one cellar level. A layout of the proposed site development is presented in Figure 4 and additional proposed development plans are provided in Appendix B. The current zoning designation is C6-4 and C6-3. Zoning C6 districts permit a wide range of high-bulk commercial uses requiring a central location such as corporate headquarters, large hotels, department stores and entertainment facilities in high-rise mixed buildings. The proposed use is consistent with existing zoning for the property.

The proposed development, referred to as the High Line 28-29 development, will consist of two 13-story buildings and one 35-story building that connect at the ground floor and share a common atrium. There will also be 1-story retail commercial space beneath the High Line structure. The 35-story building will be located along 10th Avenue. One 13-story building will be located on West 28th Street and another 13-story building will be located on West 29th Street.

The buildings are anticipated to include a total of 375 apartments with gross building area divided into: 338,527 sf residential, 20,513 sf of commercial, 17,817 sf of garage and 2,858 sf of bike storage.

The proposed building along W 29th Street will have an approximately 10,370 square-foot cellar with top of foundation slab at el -0.25 Borough President of Manhattan Datum (BPMD).

The top of foundation slap corresponds to approximately 12 ft below grade surface (bgs). To minimize the need for underpinning, the cellar will begin ten feet from the property line on the western boundary of Lot 45 and the eastern border of Lot 42. The proposed basement setbacks will be excavated approximately four feet deep to accommodate foundation components. The proposed building along 10th Avenue will have an approximately 9,875 square-foot cellar with top of foundation slab at el 2.8 (approximately 10.7 ft bgs). The cellar will begin ten feet from the southern property line of Lot 32. This setback will be excavated approximately four feet deep to accommodate foundation components. The proposed building along W 28th Street will have an approximately 7,590 square-foot cellar with top of foundation slab at el +0.31 (approximately 12 ft bgs). Cellar excavation and foundation installation for the three towers is expected to extend into the groundwater table.

The proposed retail building underneath the High Line will have a footprint of approximately 9,325 square feet. No cellar level is proposed for the building underneath the existing High Line. The existing slab and foundation components will be reused to the extent practicable. Portions of the existing slab will be removed to accommodate contaminant hot spot removal and to facilitate installation of engineering controls, as required.

Approximately 23,200 tons (15,400 cubic yards) of soil and fill material is anticipated to be excavated and disposed to accommodate the proposed development. Development plans are included as Appendix B.

Summary of Past Uses of Site and Areas of Concern

A review of historic Sanborn fire insurance and topographic maps, aerial photographs, and various databases revealed that the Site was occupied by a metal fabricating facility, auto repair, Chinese laundry, parking lot, welding works, towing company, wagon builder, blacksmith, construction company and a trucking company. By 1930, the High Line elevated railroad tracks roughly transected the Site in a north-south orientation. Circa 1976 Lots 27, 32 and 34 operated as a metal fabricated facility, auto repair, and parking lot, respectively, and continued operation until at least 1996.

The surrounding area has been primarily occupied by various commercial, industrial and manufacturing entities. Surrounding properties to the west included a metal ceiling factory, truck repair, iron works and garage with buried gasoline tanks. Properties to the north included an auto repair, metal purchasing company, metal sorting facility and a former gasoline station. Properties to the south included a metal sorting facility and a former gasoline station. Properties to the east included the United States Post Office sorting facility. Multiple fuel oil and gasoline storage tanks were present on properties in the surrounding area.

The Areas of Concern identified at the Site and surrounding properties are described below and shown on Figure 6.

AOC 1 –Site Area Excluding High Line (Block 700, Lots 45, 44, 42, 34, 32, and the western portion of Lot 27)

Soil and groundwater contaminants including VOCs, SVOCs, metals and pesticides were identified at the Site during previous environmental investigation in 2007. Known and suspected contaminants for this AOC are related to the following:

- Known Soil and Groundwater Impacts - Previous sample laboratory data documented the presence of contaminants in the soil and groundwater at concentrations exceeding the 6 NYCRR Part 375 Unrestricted Use SCOs. Additionally, petroleum impacts were identified in soil in Lot 32 and a spill was reported to NYSDEC (Spill No. 0700172).
- Historic Fill - The Site elevation was increased by filling along the eastern shoreline of the Hudson River between 1865 and 1897 with fill material of unknown origin. According to historical map review, a small cove and stream were historically located at the Site. Previous Site investigation characterized the fill as a heterogeneous mix of fine to medium sand, ashes and brick fragments.
- Historic Use - Lots 42, 44 and 45 have historically been used as an auto repair, iron works, welding works, tool manufacturer, construction company, trucking company, blacksmith, wagon builder, express depot and towing company. Lot 27 was used as a metal fabricating facility and Lot 34 was used for parking. Lot 32 was used as an auto repair and Chinese laundry. Potential contaminants associated with the historic operations include petroleum products, solvents and other hazardous compounds.

AOC 2 – Area under High Line (Block 700, Lots 38 and the eastern portion of Lot 27)
Soil and groundwater contaminants including VOCs, SVOCs, metals and pesticides were identified at the Site beneath the High Line during previous environmental investigation in 2007. Known and suspected contaminants for this AOC are related to the following:

- Known Soil and Groundwater Impacts- Soil and groundwater contamination was identified at the Site in the area under the High Line structure. Elevated PCE was identified in soil in Lot 38 beneath the High Line at concentrations up to 40.1 mg/kg. Additionally, the greatest concentrations of chlorinated solvent parent compounds (PCE and TCE) in groundwater were identified beneath the High Line.
- Historic Fill - The Site elevation was increased by filling along the eastern shoreline of the Hudson River between 1865 and 1897 with fill material of unknown origin. According to historical map review, a small cove and stream were historically located at the Site. Previous Site investigation characterized the fill as a heterogeneous mix of fine to medium sand, ashes and brick fragments.
- Historic Use- By 1930, the High Line elevated railroad tracks roughly transected the Site in a north-south orientation. Lot 38 and the eastern portion of Lot 27 have historically been used as an auto repair and a metal fabricating facility. The Site is now under construction; however, during the Site reconnaissance, the area beneath the High Line (lot 38 and the eastern portion of lot 27) was used as an auto repair shop. Degreasers were identified in the auto repair shop; however, no dry wells, floor drains, or cracks in the concrete floor were observed. Potential contaminants associated with the historic operations include petroleum products, solvents and other hazardous compounds.

AOC 3 – Adjacent and Surrounding Properties (Historic and Current Use)
Known and suspected contaminants for this AOC are related to the following:

- Suspected Soil Vapor and Groundwater Impacts- An open off-site NYSDEC Spill site (NYSDEC Spill No 0701228) is located up-gradient and may have impacted Site groundwater or soil vapor. The spill was related to a petroleum release.
- Historic Use- Adjoining and surrounding properties were historically occupied by an auto repair, iron works, chemical bulk storage facilities, filling station, and metal sorting facility. Potential contaminants associated with the historic operations include petroleum products, solvents and other hazardous compounds. Potential spills and leaks of petroleum products, chlorinated solvents, or other hazardous substances may have migrated to the Site and impacted groundwater, and/or soil vapor.

Summary of the Work Performed under the Remedial Investigation

To supplement existing Site data, Langan performed the following scope of work on behalf of the Volunteer:

1. A Site inspection and a geophysical survey to identify physical obstructions and subsurface utilities and structures;
2. Installation of 23 soil borings (EB-1 through EB-21, DB-1 and DB-2) across the Site, and collection of 117 grab soil samples and 14 composite soil samples for laboratory analysis from the soil borings to evaluate soil quality;
3. Installation of 10 groundwater monitoring wells throughout the Site to establish groundwater depth and flow direction and collected 10 groundwater samples for laboratory analysis to evaluate groundwater quality;
4. Installation of 10 soil vapor probes throughout the Site and collection of two ambient air and 10 soil vapor samples for laboratory analysis.

Summary of Environmental Findings at the Site

1. Elevation of the property ranges from el 10 to el 13[1].
2. Groundwater elevation ranges from el 0.77 to el 2.98 based on recent measurements. Depth to groundwater ranges from approximately 8 to 13 feet.
3. Groundwater flow is generally from east to west beneath the Site.
4. Depth to bedrock is approximately 20 to 45 feet (el -7 to el -35).
5. The stratigraphy of the Site, from the surface down, consists of approximately 7 to 10 feet of historic urban fill material underlain by approximately 4 to 6 feet of native silty sand, which is underlain by a 3-plus-foot thick clay and organics layer.
6. Soil/fill samples collected during the RI showed VOC, SVOC, metal, PCB and pesticides exceedances of the 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives. Chlorinated solvent parent compound (PCE) exceedances were identified beneath the High Line, corresponding to AOC 2. VOCs including 1,4 dioxane (max 2.4 ppm), cis-1,2-dichloroethene (max. 520 ppb), acetone, methylene chloride, tetrachloroethene (PCE; max. 40 ppm) and vinyl chloride (max 140 ppb) were detected in soil samples. Of these, only PCE was above Track 2 Restricted Residential SCOs. Total VOCs ranged from non-detect to 40.1 mg/kg with the highest total VOCs located beneath the High Line. All PCE exceedances were limited to the shallow soil samples (depth of five feet or less) with deeper samples meeting Unrestricted Use SCOs. Several SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, ideno(1,2,3-cd)pyrene and pyrene were detected at concentrations exceeding Restricted

[1] Survey prepared by Precision Surveys dated March 14, 2012. Datum is Borough President of Manhattan Datum (BPMD) which is 2.75 feet above mean sea level at Sandy Hook New Jersey as defined by the United States Geologic Survey (USGS NGVD 1929).

Residential SCOs. Highest total SVOCs (3,161 ppm) were located in shallow fill location beneath the High Line (AOC 2) and are representative of a petroleum spill. No exceedances of Unrestricted Use SCOs were identified in soil samples collected deeper than 10 feet bgs with the exception of SB-11. Metals including arsenic (max. 68 ppm), barium (max. 1470 ppm), copper (max. 550 ppm), lead (max. 1470 ppm), mercury (max 39 ppm) and cadmium (max. 4.7 ppm) exceeded in soil above the Restricted Residential Use SCOs across the Site. Highest mercury concentration was detected underneath the highline in one soil boring. Lead and barium also exceeded Restricted Residential Use SCOs in one soil sample collected deeper than 10 feet bgs.PCBs were detected in only one soil sample, collected from the 0 to 7 ft depth (16.4 ppm). Four pesticides 4,4'-DDE, 4,4'-DDD, 4,4'-DDT and dieldrin were detected above Unrestricted Use SCOs; however, there were no pesticides identified above Restricted Residential SCOs.

7. Groundwater samples collected during the RI showed VOC, SVOC and metal exceedances of the New York State Department of Environmental Conservation Groundwater Water Quality Standards (GQS). PCB and pesticides were not detected in any groundwater sample(s). Multiple (17) VOC exceedances were identified in groundwater across the site. Total VOCs ranged from 0.71 ug/l to 6,269 ug/l. Total chlorinated solvents ranged from 8.7 ug/l to 6,159 ug/l. Chlorinated solvents and breakdown products were also identified in up-gradient well locations. Chlorinated solvent parent (PCE detected at maximum of 50 ug/l and TCE detected at maximum of 21 ug/l) concentrations in groundwater are highest beneath the High Line structure. Chlorinated solvent breakdown products (vinly chloride detected at maximum of 1,200 ug/l and Cis 1,2-Dichloroethene detected at maximum of 5,200 ug/l) in groundwater at the Site are highest down-gradient of the High Line structure. Chlorinated solvents in groundwater at the Site are attributed to offsite sources and potential releases related to historic site operations. Eight SVOC exceedances were identified in groundwater across the Site corresponding with AOC 1 and AOC 2 and included 6 PAH compounds. Total SVOCs ranged from below detection limit to 35.03 ug/l. Several metals including arsenic (max. 45 ppb), lead (max. 29 ppb), magnesium, manganese, iron, aluminum, antimony and sodium exceeded GQS at the Site.
8. Soil vapor samples collected during the RI identified volatile organic compounds (VOCs) elevated above the New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (October 2006) values (AGVs). Tetrachloroethene was detected in the range from 2.5 $\mu g/m^3$ to 16,300 $\mu g/m^3$ and trichloroethene was detected in the range from 1.36 $\mu g/m^3$ to 372 $\mu g/m^3$, with the greatest concentrations of these compounds identified beneath the High Line. The total VOCs detected in the ambient air samples ranged from 42.54 to 83.04 $\mu g/m^3$. Contaminant concentrations in soil vapor are likely attributed to the historic and current auto repair use at the Site and surrounding properties.

Data collected during the RI is sufficient to delineate the distribution of contaminants in soil, groundwater and soil vapor at the Site.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

Langan Engineering and Environmental Services, Inc., P.C. (Langan) was retained by Kadima Tenth Avenue SPE LLC (the "Volunteer") to complete a Remedial Investigation (RI) for the development of the property located at 507-515 West 28th Street, New York, New York (The "Site"). New York City tax maps identify the Site as Block 700, Lots 27, 32, 34, 38, 42, 44 and 45. The proposed development consists of three new multi-story, mixed-use structures with one cellar level and a 1-story grade-level retail structure beneath the High Line. Per City Environmental Quality Review (CEQR) No. 03DCP069M, Block 700, Lots 32 and 34 have an "e" designation for Hazardous Materials (Hazmat) and Noise (window wall attenuation and alternate ventilation). Block 700, Lots 42, 44, and 45 are "e" designated for Hazmat, Noise, and Air Quality (HVAC fuel limited to natural gas). Although Lots 27 and 38 have no "e" designation, the entire site will be managed as a combined Hazmat, Air Quality, and Noise "e" as per the NYC Zoning Resolution "e" requirements. The "e" designations require coordination with the New York City Office of Environmental Remediation (OER) to satisfy environmental requirements. Additionally, there is an open petroleum spill (New York State Department of Environmental Conservation [NYSDEC] Spill Number 07-00172) at 319-325 10th Avenue, which corresponds to Block 700, Lots 32 and 34. The open spill requires coordination with the NYSDEC to obtain closure. The Volunteer has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate the Site.

The RI work was performed between August 9 and September 14, 2012. This Remedial Investigation Report (RIR) summarizes the nature and extent of contamination and provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy that is protective of human health and the environment consistent with the proposed use of the property pursuant to RCNY§ 43-1407(f).

1.1 Site Location and Current Usage

The Site is located at 507-515 West 28th Street, New York, New York and is in the West Chelsea section of Manhattan. The Site is identified as Block 700, Lots 27, 32, 34, 38, 42, 44 and 45 on the New York City Tax Map (Figure 1). The Site has an area of approximately 39,500 square feet and is bounded by West 29th Street to the north, West 28th Street to the south, 10th Avenue to the east, and the Avalon development and a two-story masonry building to the west. A map showing the regional location of the Site is provided as Figure 2.

Currently, a portion of the Site is being used as a grade-level asphalt paved commercial parking lot (Lot 34). All other structures that exist on the remaining portions of the Site are is being demolished (Lots 32, 42, 44, 45, 27 and 38).. The elevated High Line Park roughly transects the Site in a north-south orientation.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site consists of a mixed-use residential and commercial development with one cellar level. A layout of the proposed site development is presented in Figure 4 and additional proposed development plans are provided in Appendix B. The current zoning designation is C6-4 and C6-3. Zoning C6 districts permit a wide range of high-bulk commercial uses requiring a central location such as corporate headquarters, large hotels, department stores and entertainment facilities in high-rise mixed buildings. The proposed use is consistent with existing zoning for the property.

The proposed development, referred to as the High Line 28-29 development, will consist of two 13-story buildings and one 35-story building that connect at the ground floor and share a common atrium. There will also be 1-story retail commercial space beneath the High Line structure. The 35-story building will be located along 10th Avenue. One 13-story building will be located on West 28th Street and another 13-story building will be located on West 29th Street.

The buildings are anticipated to include a total of 375 apartments with gross building area divided into: 338,527 sf residential, 20,513 sf of commercial, 17,817 sf of garage and 2,858 sf of bike storage.

The proposed building along W 29th Street will have an approximately 10,370 square-foot cellar with top of foundation slab at el -0.25 (approximately 12 ft below grade surface [bgs]). To minimize the need for underpinning, the cellar will begin ten feet from the property line on the western boundary of Lot 45 and the eastern border of Lot 42. The proposed basement setbacks will be excavated approximately four feet deep to accommodate foundation components. The proposed building along 10th Avenue will have an approximately 9,875 square-foot cellar with top of foundation slab at el 2.8 (approximately 10.7 ft bgs). The cellar will begin ten feet from the southern property line of Lot 32. This setback will be excavated approximately four feet deep to accommodate foundation components. The proposed building along W 28th Street will have an approximately 7,590 square-foot cellar with top of foundation slab at el +0.31 (approximately 12 ft bgs). Cellar excavation and foundation installation for the three towers is expected to extend into the groundwater table.

The proposed building underneath the High Line will have a footprint of approximately 9,325 square feet. No cellar level is proposed for the building underneath the existing High Line. The existing slab and foundation components will be reused to the extent practicable. Although portions of the existing slab will be removed to accommodate contaminant hot spot removal and to facilitate installation of remedial and engineering controls, a new concrete slab will be poured/installed.

Approximately 23,200 tons (15,400 cubic yards) of soil and fill material is anticipated to be excavated and disposed to accommodate the proposed development. Development plans are included as Appendix B.

1.3 Description of Surrounding Properties

The Site is located in an area generally characterized by multi-story commercial, residential and industrial buildings in zoning districts designated for commercial, residential and manufacturing uses, which are summarized in the table below:

DIRECTION	ADJOINING PROPERTIES	SURROUNDING PROPERTIES
North	Multi-story residential, West 29th Street followed by multi-story industrial buildings, an active construction site, and a multi-family residential building with 1st floor commercial	Multi-story mixed use, Hudson yards rail yard
East	10th Avenue	The post office sorting facility, open space/outdoor recreation
South	Multi-story residential with commercial first floors followed by West 28th Street	Metal sorting facility, multi-story residential and commercial buildings
West	Commercial building and an active construction site	Multi-story commercial buildings and an active construction site

Nearby sensitive receptors include a daycare facility and hospital. The nearest hospital is St. Luke's Roosevelt Hospital, located approximately 1.6 miles to the north. A daycare facility is located approximately 620 ft southeast of the Site. A Surrounding Land Use Plan is provided as Figure 5.

2.0 SITE HISTORY

2.1 Past Uses and Ownership

A review of historic Sanborn fire insurance and topographic maps, aerial photographs, and various databases revealed that Site use with the potential to impact the property subsurface included the following:

Block and Lot	Historic Site Use
700, 27	Metal Fabricating Facility, Elevated Railway
700, 32	Auto Repair, Chinese Laundry
700, 34	Parking
700, 38	Auto Repair, Elevated Railway
700, 42	Iron Works, Tool manufacturer, Trucking Company, Express Depot, Warehouse
700, 44	Auto Repair, Welding Works, Towing Company, Wagon Builder, Blacksmith, Warehouses
700, 45	Construction Company, Trucking Company, Express Depot

Historic document review identified historic industrial and commercial site uses. By at least 1930, the High Line elevated railroad tracks roughly bisected the Site in a north-south orientation

The surrounding area has primarily been used for commercial, industrial and manufacturing. Surrounding properties to the west included a metal ceiling factory, truck repair, iron works and garage with buried gasoline tanks. Properties to the north included an auto repair, metal purchasing company, metal sorting facility and a former gasoline station. Properties to the south included a metal sorting facility and a former gasoline station. Properties to the east included the post office sorting facility. Multiple fuel oil and gasoline storage tanks were present on properties in the surrounding area.

2.2 Previous Investigations

Previous environmental reports were provided to Langan for review as part of this RIR. These reports are summarized below and are included in Appendix A.

December 2007 Phase I Environmental Site Assessment (ESA), prepared by GZA
The Phase I ESA was conducted at 512-514 & 516 West 29th Street in the Chelsea neighborhood of Manhattan (Block 700, Lots 42 and 44). The Phase I ESA included a review of available historical and environmental records, visual observations of the subject and adjoining properties, and personal interviews with available persons having knowledge of the property.

The Phase I identified the following Recognized Environmental Conditions (RECs) in connection with the property:

- Historical usage of the subject and surrounding properties for industrial purposes;
- Little "E" designation on the property for Hazmat, Noise and Air;
- An NYSDEC LTANK spill with petroleum-contaminated soil and groundwater exists at 524 West 29th Street. Two gasoline USTs (one 4,000-gallon and one 550-gallon) were removed from this facility in 2003. Based on the levels of contamination, the NYSDEC required the installation of an Air Sparge/Soil Vapor Extraction System (AS/SVE System) as a remedial action.

December 2007 Site Investigation Report/Remedial Action Plan, prepared by GZA

The Site Investigation Report (SIR)/ Remedial Action Plan (RAP) was prepared for 319-321 & 323-325 10th Avenue, 511-515 West 28th Street, and 504-506 West 29th Street in the Chelsea neighborhood of Manhattan (Block 700, Lots 32 & 34, Lot 27, and Lot 38). The Site Investigation included the following investigative activities:

- A geophysical survey
- Advancement of 26 soil borings and collection of 53 soil samples plus 2 duplicates
- Installation of 10 groundwater monitoring wells and collection of 10 groundwater samples plus 1 duplicate
- Well casing elevation survey to access groundwater flow direction

The results of the SIR show fill material consisting of a heterogeneous mix of fine to medium sand, ashes, and brick fragments from ground surface to approximately 10 ft bgs. Soil and groundwater samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), target analyte list (TAL) metals, polychlorinated biphenyls (PCBs) and pesticides. Lab analytical results indicate that tetrachloroethylene (PCE) above regulatory standards was identified in two locations (SB-10 (0-2) and SB-11 (0-2), which were located beneath the High Line corresponding to AOC 2. SVOCs were detected above regulatory standards in the 0-2 ft samples across the site. Deeper samples also contained concentrations of SVOCs above regulatory standards at five locations. Metals were detected above soil cleanup standards across the Site. Chromium concentrations up to 33 mg/kg and mercury concentrations up to 39 mg/kg were identified.

Groundwater laboratory results indicate that VOCs were detected above regulatory standards in seven of the 10 groundwater monitoring wells. VOC exceedances included chlorinated solvents and petroleum compounds. One SVOC, bis(2-ethylhexyl)phalate was detected above the regulatory standard. All groundwater samples (dissolved and total) contained concentrations of TAL metals above regulatory standards.

The Remedial Action work plan included excavation and disposal of Site soil to a depth of 32 ft, collection of endpoint samples, dewatering and treatment of groundwater, installation of a vapor barrier, groundwater monitored natural attenuation (MNA), community air monitoring, and implementation of a construction health and safety plan and quality assurance/ quality control measures.

2.3 Site Inspection

To assist in an assessment of Site history and observe current conditions, a Site inspection was performed on July 26, 2012 by Joseph Good of Langan. The weather at the time of the inspection was sunny with a temperature of approximately 70 degrees Fahrenheit. An asphalt-paved parking area with hydraulic car lifts was observed in the eastern section of the Site (west side of Lot 34). Cars and storage trucks were parked in the lot and on the hydraulic lifts. Lot 32 was improved with a vacant one-story garage building. The West 29th Street property buildings (Lots 42, 44, and 45) were being demolished at the time of the Site visit. The former club building on Lot 27 was unoccupied. The building on Lot 38 and the eastern portion of Lot 27 operated as an automobile repair shop.

2.4 Areas of Concern

The Areas of Concern identified at the Site and surrounding properties are described below and shown on Figure 6.

AOC 1 –Site Area Excluding High Line (Block 700, Lots 45, 44, 42, 34, 32, and the western portion of Lot 27)
Soil and groundwater contaminants including VOCs, SVOCs, metals and pesticides were identified at the Site during previous environmental investigation in 2007. Known and suspected contaminants for this AOC are related to the following:

- Known Soil and Groundwater Impacts - Previous sample laboratory data documented the presence of contaminants in the soil and groundwater at concentrations exceeding the 6 NYCRR Part 375 Unrestricted Use SCOs. Additionally, petroleum impacts were identified in soil in Lot 32 and a spill was reported to NYSDEC (Spill No. 0700172).
- Historic Fill - The Site elevation was increased by filling along the eastern shoreline of the Hudson River between 1865 and 1897 with fill material of unknown origin. According to historical map review, a small cove and stream were historically located at the Site. Previous Site investigation characterized the fill as a heterogeneous mix of fine to medium sand, ashes and brick fragments.
- Historic Use - Lots 42, 44 and 45 have historically been used as an auto repair, iron works, welding works, tool manufacturer, construction company, trucking company, blacksmith, wagon builder, express depot and towing company. Lot 27 was used as a metal fabricating facility and Lot 34 was used for parking. Lot 32 was used as an auto

repair and Chinese laundry. Potential contaminants associated with the historic operations include petroleum products, solvents and other hazardous compounds.

AOC 2 – Area under High Line (Block 700, Lots 38 and the eastern portion of Lot 27)

Soil and groundwater contaminants including VOCs, SVOCs, metals and pesticides were identified at the Site beneath the High Line during previous environmental investigation in 2007. Known and suspected contaminants for this AOC are related to the following:

- Known Soil and Groundwater Impacts- Soil and groundwater contamination was identified at the Site in the area under the High Line structure. Elevated PCE was identified in soil in Lot 38 beneath the High Line at concentrations up to 40.1 mg/kg. Additionally, the greatest concentrations of chlorinated solvent parent compounds (PCE and TCE) in groundwater were identified beneath the High Line.
- Historic Fill - The Site elevation was increased by filling along the eastern shoreline of the Hudson River between 1865 and 1897 with fill material of unknown origin. According to historical map review, a small cove and stream were historically located at the Site. Previous Site investigation characterized the fill as a heterogeneous mix of fine to medium sand, ashes and brick fragments.

  Historic Use- By 1930, the High Line elevated railroad tracks roughly transected the Site in a north-south orientation. Lot 38 and the eastern portion of Lot 27 have historically been used as an auto repair and a metal fabricating facility. The Site is now under construction; however, during the Site reconnaissance, the area beneath the High Line (lot 38 and the eastern portion of lot 27) was used as an auto repair shop. Degreasers were identified in the auto repair shop; however, no dry wells, floor drains, or cracks in the concrete floor were observed. Potential contaminants associated with the historic operations include petroleum products, solvents and other hazardous compounds.

AOC 3 – Adjacent and Surrounding Properties (Historic and Current Use)

Known and suspected contaminants for this AOC are related to the following:

- Suspected Soil Vapor and Groundwater Impacts- An open off-site NYSDEC Spill site (NYSDEC Spill No 0701228) is located up-gradient and may have impacted Site groundwater or soil vapor. The spill was related to a petroleum release.
- Historic Use- Adjoining and surrounding properties were historically occupied by an auto repair, iron works, chemical bulk storage facilities, filling station, and metal sorting facility. Potential contaminants associated with the historic operations include petroleum products, solvents and other hazardous compounds. Potential spills and leaks of petroleum products, chlorinated solvents, or other hazardous substances may have migrated to the Site and impacted groundwater, and/or soil vapor.

3.0 PROJECT MANAGEMENT

3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Joel B. Landes, P.E.

3.2 Health and Safety

All work described in this RIR was performed in full compliance with applicable laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements.

3.3 Materials Management

All material encountered during the RI was managed in accordance with applicable laws and regulations. Excess purge water generated during the RI were containerized in four steel, DOT-approved, 55-gallon drums, which are pending off-site disposal by Laurel Environmental Associates, Ltd. of Huntington Station, New York.

4.0 REMEDIAL INVESTIGATION ACTIVITIES

To supplement existing site data, Langan performed the following scope of work on behalf of the Volunteer:

1. Conducted a Site inspection and a geophysical survey to identify physical obstructions and subsurface utilities and structures;
2. Installed 23 soil borings (EB-1 through EB-21, DB-1 and DB-2) across the Site, and collected 117 grab soil samples and 14 composite soil samples for laboratory analysis from the soil borings to evaluate soil quality;
3. Installed 10 groundwater monitoring wells throughout the Site to establish groundwater flow direction and collected 10 groundwater samples for laboratory analysis to evaluate groundwater quality;
4. Installed 10 soil vapor probes throughout the Site and collected two ambient air and 10 soil vapor samples for laboratory analysis.

4.1 Geophysical Investigation

Prior to commencement of ground-intrusive investigation, the New York City One-Call center was contacted to identify subsurface utility services entering the Site. On August 9, 2012, Nova Geophysical Services (Nova) of Douglaston, New York conducted a geophysical survey of Lots 42, 44 and 45 along W 29th Street. A geophysical survey had previously been completed on Lots 27, 32, 34 and 38 as part of the environmental site investigation performed by GZA in 2007.

Nova utilized ground penetrating radar (GPR) and electromagnetic detection equipment to survey for potential USTs and to identify buried utilities or other subsurface structures at the investigation boring and soil probe locations. The geophysical survey identified subsurface anomalies consistent with former utility lines and minor scattered anomalies throughout the survey area. Major subsurface anomalies indicative of USTs were not identified during the survey. A copy of the Geophysical Report is provided as Appendix C.

4.2 Soil Investigation

Drilling Procedures

Between August 14 and 22, 2012, 23 soil borings were completed at the Site by Laurel Environmental Associates, Ltd. (Laurel) of Huntington Station, New York under the supervision of a Langan field engineer. All borings were advanced using a track-mounted Geoprobe™ 6610DT drill rig. Boring depths ranged from 15 to 22 ft below grade surface (bgs). Soil boring locations are presented on Figure 7.

Soil samples were collected continuously to completion depth in 5-foot macrocore® sample barrels with dedicated acetate liners. Soil samples were inspected for visual and olfactory evidence of contamination and screened for VOCs with a photoionization detector (PID) equipped with a 10.6 electron volt (eV) lamp. Field observations were documented in boring logs that are presented in Appendix D. A summary of soil boring information is included in Table 1.

Soil Observations

Soils at the Site are generally composed of historic urban fill material consisting of varying sand, silt, gravel, cobbles, wood and brick fragments, and coal from surface grade to approximately 7 to 10 ft bgs. The fill material was underlain by a layer of native brown silty sand ranging in depth from approximately 7 to 12 ft bgs. A clay layer with organic material was observed at approximately 12 to 15 ft bgs. The clay layer extended to the bottom of the soil borings at approximately 15 to 20 ft bgs. Petroleum odors were identified in boring EB-18 with elevated PID readings up to 160 ppm. Sweet odors were identified in boring EB-12 with elevated PID readings up to 121 ppm. Organic material and associated odors were observed in all borings (except EB-10) at an approximate depth of 13 to 15 ft bgs. Bedrock was not encountered during the remedial investigation.

4.3 Groundwater Investigation

Monitoring Well Construction

Soil borings at ten locations (EB-1 through EB-4, EB-6, EB-9, EB-12, EB-15, EB-18 and EB-21) were converted into temporary groundwater monitoring wells. All wells were constructed with 1-inch diameter polyvinyl chloride (PVC) solid riser pipe and 0.01-inch slotted screen pipe with pre-packed sand. The well screen was set with screen straddling the observed groundwater table. At each monitoring well, clean sand was placed in the annulus between the borehole and the outside of the prepack sand surrounding the well screen from the bottom of the boring to approximately 2 ft above the screen. A bentonite seal filled the remaining borehole annulus, to within 1 ft below surface grade. Wells located in areas where they could easily be damaged during daily activities (i.e., monitoring wells W-6, W-7, W-9 and W-10) were finished with protective flush-mount, bolt-down road boxes set into a concrete collar. Monitoring well locations are shown on Figure 7 and well construction logs are presented in Appendix E. Following installation, the wells were developed by purging a minimum of 3 well volumes using a peristaltic pump.

Groundwater Elevation Survey

The top of each PVC well casing was surveyed by Langan between September 4 and 14, 2012. Langan completed synoptic groundwater level gauging on August 29 and 30, 2012. Groundwater levels were measured using an oil/water interface probe, recorded in a field log, and compared to top-of-casing elevations to calculate groundwater elevation and determine flow direction at the Site.

Groundwater Observations

Groundwater was observed during drilling activities at approximately 8 ft bgs throughout the Site. No sheen or evidence of free product was observed during gauging and sampling activities with the exception of W-4 which contained a slight sheen during sampling. No product was identified in W-4. A PID reading of 3.0 ppm was detected at W-7; however, the detection was attributed to painting activities in the area. A summary of monitoring well construction is presented in Table 1. Groundwater monitoring well locations are shown on Figure 7. Well construction logs and groundwater sampling logs are included as Appendix E and F, respectively.

4.4 Soil Vapor Investigation

Ten soil vapor samples and two ambient air sample were collected for laboratory analysis during this RI. Soil vapor points, SV-1 through SV-10, were advanced with a Geoprobe® drill rig to 5 ft bgs. The points were constructed with double woven stainless steel soil vapor sampling mesh attached to Teflon tubing. Approximately 2 ft of glass bead filter pack was installed around the screen implant by pouring the material into the annulus. The remaining annular space was backfilled to grade with hydrated bentonite. Soil vapor and ambient air sampling locations are shown in Figure 7.

4.5 Sample collection and Chemical Analysis

Soil, groundwater and soil vapor samples were collected throughout the Site to supplement existing data in order to evaluate environmental conditions related to the AOCs. Discrete (grab) samples have been used to delineate the nature and extent of environmental impacts and to determine the impact of contaminants on public health and the environment. The sampling performed and presented in this RIR provides sufficient basis for evaluation of remedial action alternatives, establishment of a qualitative human health exposure assessment, and selection of a final remedy.

Soil Sampling Procedures

A total of 117 grab soil samples and 14 composite samples were collected for laboratory analysis during the Remedial Investigation. A soil sample summary table is included as Table 2. Soil samples were divided into three categories:

1. Site/Waste Characterization Soil Sampling and Analysis- The purpose was to characterize soil within the planned development cut to support preparation of a Remedial Action Plan and Health and Safety Plan, and to provide data to support off-site disposal.
2. Endpoint Soil Sampling and Analysis- The purpose was to provide analytical data that represents the residual site soil conditions following completion of the development excavation for the cellar level and building foundation components.
3. Hot Spot Delineation Sampling and Analysis- The purpose was to delineate hot spot areas identified during previous investigations. Delineation was necessary to determine if over-excavation of contaminant hot spot areas will be required. There is no cellar level underneath the High Line and the cut is currently estimated at up to 4 to 6 ft below grade.

<u>Site/Waste Characterization Soil Sampling and Analysis</u>

Soil samples were collected from 21 boring locations (EB-1 though EB-21). The borings were completed to the proposed cellar development cut (estimated at 14 ft bgs) or the bottom of observed contamination (if present), whichever was deeper.

Two waste characterization grab samples from each boring (42 total samples) were collected and analyzed for total petroleum hydrocarbons (TPH) gasoline range organics (GRO), and TPH diesel range organics (DRO) via EPA method 8015. Additionally, 14 grab samples were analyzed for TCL VOCs via EPA Method 8260 and Toxicity Characteristic Leaching Procedure (TCLP) VOCs. For the VOCs, samples were collected using EnCore™ samplers.

A total of 14 composite samples were collected and prepared by homogenizing soil collected from five discrete points from one or more adjacent boring locations. The development excavation was divided into 7 waste characterization grids and composite samples were allocated as described below. The waste characterization grids are shown on Figure 8.

- Grids 1, 2, 3, 6 and 7 have 2 composite samples; one from the shallow development cut interval and one from the deep interval (total of 10 composite samples).
- Grids 4 and 5 are underneath the High Line (no cellar) and therefore only have a shallow interval composite (total of 2 composite samples).
- EB-18 located along 10th Avenue was identified as a petroleum-contaminated area and an additional waste characterization sample (not associated with the grid system) was collected from this boring.

- EB-12 located beneath the High Line was identified as a solvent-contaminated area and an additional waste characterization sample (not associated with the grid system) was collected from this boring.

The composite soil samples were analyzed for TCL SVOCs via EPA Method 8270, TAL metals via EPA methods 6010 and 6020, PCBs via EPA Method 8082, Pesticides via EPA Method 8081, Herbicides via EPA Method 8151, and Resource Conservation and Recovery Act (RCRA) characteristics including ignitability, corrosivity, reactivity, and toxicity (TCLP SVOCs, metals, pesticides, and herbicides). Additionally, one composite sample was analyzed for paint filter via EPA Method 9095.

Endpoint Soil Sampling and Analysis

Sixteen endpoint grab soil samples were collected from the proposed final development depth to document the environmental quality of remnant soils following site development. Endpoint soil sample depths are detailed on Table 2. The endpoint samples were analyzed for 6 NYCRR Part 375 VOCs, SVOCs, metals, PCBs and pesticides.

Delineation Sampling and Analysis

In addition to the characterization and endpoint sampling described above, two borings (DB-1 and DB-2) were advanced to provide additional delineation of contamination hot spot areas (e.g. mercury and chlorinated solvents) beneath the High Line. These hot spots were identified based on previous environmental reports for the Site. The hot spots are located in the area underneath the High Line, where the planned excavation depth ranges up to 4 to 6 feet below grade to accommodate an at-grade building slab and foundation components (no cellar level). Therefore, additional delineation was required to determine the potential extent of over-excavation to remove the hot-spot to the extent practical.

One boring (DB-1) was advanced approximately 13 ft to the west of GZA borings SB-10 and SB-11 that previously identified a PCE, TCE and mercury hot spot at a depth of 0 to 2 ft. The second delineation boring (DB-2) was advanced in the location of GZA boring SB-17, where a mercury hotspot was identified at a depth of 0-2 ft. Grab samples were also collected from Site/Waste Characterization borings (EB-8, EB-12, EB-16) surrounding the hot spots to assist in the delineation. Hot spot delineation sampling is detailed in Table 2

The vertical extent of each hot spot was determined at borings EB-12 and DB-2 by collecting a series of 2-foot interval soil samples starting with the 4 to 6 foot depth interval and continuing through the 12 to 14 foot interval (i.e., 4 to 6 ft, 6 to 8 ft, 8 to 10 ft, 10-12 ft and 12 to 14 ft). A stop analysis was performed for the contaminants of concern, where deeper samples were only analyzed if the grab sample from the overlying material was above the 6 NYCRR Part 375 Restricted Residential SCOs for PCE or TCE and 5.7 for mercury (6 NYCRR Part 375 Restricted Industrial Use SCO).

For DB-1, EB-8 and EB-16, two grab samples were collected per boring to provide additional horizontal delineation. One sample was collected from the interval immediately below the

surface cover (i.e. 0-2 ft bgs) and was analyzed for chlorinated solvents and mercury. A second sample was collected from the location with highest visual, olfactory and instrumental (photoionization detector) indication of contamination. If no contamination was observed, the second sample was collected from the capillary fringe. The second sample was analyzed for chlorinated solvents. A second delineation sample was not collected for EB-16 because the boring was located in a basement and the sample collected immediately below the surface cover was also located at the capillary fringe.

In addition to the delineation samples described above, grab samples were also collected from the most impacted areas (visual staining, odors, elevated PID) in each boring throughout the site. A second grab sample was collected from the area immediately below the impacted area. These additional grab samples were analyzed for VOCs.

Soil samples were collected into laboratory-supplied sample jars, sealed, labeled, and placed in an ice-chilled cooler in order to maintain a temperature of 4 degrees Celsius (°C). The samples were transported under standard chain-of-custody protocol to Alpha Analytical, Inc. (Alpha) of Westborough, Massachusetts, a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory. A copy of Alpha's NYSDOH ELAP certification is provided in Appendix H.

Soil sampling locations are shown on Figure 7 and a summary of soil samples and analyses is provided in Table 2.

Groundwater Sampling Procedures

Between August 29 and September 1, 2012, groundwater samples were collected from monitoring wells W-1 through W-10 and a duplicate sample was collected from W-4. The wells were purged and sampled approximately one week after development.

Prior to sampling, the static water level was measured to the nearest 0.01 ft with a decontaminated oil/water interface probe. A minimum of 3 volumes were purged from each monitoring well location using a peristaltic pump prior to sampling. The pump was fitted with dedicated, disposable polyethylene tubing prior to sample collection. Purging rates were maintained at less than 0.5 liters per minute in order to minimize drawdown and sample turbidity. During purging and sampling, monitoring well effluent was pumped into a flow-through cell with a Horiba U-52 water quality monitoring probe attached. The Horiba U-52 was used to monitor the purge water for hydrogen ion concentration (pH), oxidation/reduction potential, conductivity, temperature, dissolved oxygen, and turbidity. Groundwater samples were collected once the parameters had stabilized to approximately 10 percent of their respective values, and the turbidity was below 50 nephelometric turbidity units (NTU).

Groundwater samples were collected directly from the discharge line into pre-cleaned, laboratory-provided containers. The sample containers were labeled, placed in a laboratory-

supplied cooler, packed with ice to maintain a temperature of 4°C, and transported by a laboratory courier to Alpha under chain of custody protocol for analysis of TCL VOCs via EPA Method 8260 and SVOCs via EPA Method 8270, TAL metals via EPA 6000/7000 Series Methods (filtered and unfiltered), PCBs via EPA Method 8082 and pesticides via EPA Method 8081. Groundwater sampling locations are shown on Figure 7 and a summary of groundwater samples and analyses is provided in Table 3. Groundwater sampling logs are provided in Appendix F.

Soil Vapor and Ambient Air Sampling

Following soil vapor sample point construction, a PID (which pumps air at approximately 0.2 liters per minute) was attached to the Teflon tubing and a minimum of three times the tubing and screen setup volume was purged. The purged soil vapor was also monitored with the PID and the value was recorded. Soil vapor and ambient air samples were collected in laboratory-cleaned and certified 5-liter stainless steel summa canisters with regulators that were supplied by Alpha. As a quality assurance/quality control (QA/QC) measure, an inert tracer gas (helium) test was completed to document that the soil vapor sampling points were properly sealed, thereby preventing subsurface infiltration of ambient air. Each Summa canister arrived from the lab with approximately 29 to 32 mm of mercury vacuum. Sampling was started by opening the canister valves. Soil vapor samples and ambient samples were collected over an approximately 2-hour period. The samples were transported by laboratory courier to Alpha for analysis of VOCs via EPA Method TO-15.

Soil vapor sampling locations are shown on Figure 7. Soil vapor sample collection data is summarized in Table 4. The soil vapor sampling log is included in Appendix G. Methodologies used for soil vapor assessment conform to the NYSDOH Final Guidance on Soil Vapor Intrusion, October 2006.

Quality Control Sampling

During the RI, trip blanks, coded field duplicate samples, and ambient air samples were collected and submitted for laboratory analysis for quality assurance/quality control (QA/QC). During the course of the investigation, the following quality control samples were collected:

<u>Soil samples:</u>

- Two coded field duplicate samples;

<u>Groundwater samples:</u>

- One coded field duplicate sample;
- Three trip blank samples (one submitted with each groundwater submittal).

<u>Soil vapor samples:</u>

- Two ambient air samples.

Chemical Analysis

Laboratory analytical work presented in this RIR has been performed as summarized in the table below. Laboratory analysis for soil, groundwater and soil vapor are also summarized in Tables 2, 3 and 4, respectively. Alpha's current ELAP certification is provided in Appendix H and completed laboratory analytical reports for all samples evaluated in this RIR are provided in digital form in Appendix I.

Factor	Description
Quality Assurance Officer	The chemical analytical quality assurance is directed by Stuart Knoop.
Chemical Analytical Laboratory	Chemical analytical laboratory(s) used in the RI is NYS ELAP certified and was Alpha Analytical, Inc.
Chemical Analytical Methods	Soil analytical methods: • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • Herbicides by EPA Method 8151A (update 3 of SW846, 1997) • PCBs by EPA Method 8082A (rev. 2000); • TCLP by EPA Method 1311 Groundwater analytical methods: • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000); Soil vapor and ambient air analytical methods: • VOCs by TO-15 VOC parameters. Trip blank analytical methods: • VOCs by EP Method 8260C (rev. 2006)

5.0 ENVIRONMENTAL EVALUATION

5.1 Geological and Hydrological Conditions

According to United States Geologic Survey (USGS) maps and historic topographic maps, New York City geology is generally characterized by layers of fill and native soil overburden underlain by metamorphic bedrock. The native overburden was generally deposited during the last continental glaciation. The overburden generally consists of glacial till and outwash predominantly in inland areas, and riverine deposits (peat, organic silt and clay) along the shorelines that have been filled in over time. Three formations of metamorphic rock, the Manhattan Schist, the Inwood Marble, and the Fordham Gneiss, are commonly found in New York City.

Beneath the ground surface, water ("groundwater") is contained within the unconsolidated geologic materials and fractured bedrock. The upper surface of the groundwater reservoir is marked by the water table surface, which fluctuates seasonally, in response to precipitation events and tides (along shorelines). The overburden deposits typical to the project area can have low to moderate hydraulic conductivities. The bedrock is relatively impermeable except where concentrations of fractures, faults or joints are present. Preferential flow occurs through the more permeable zones of the overburden, such as individual sand or gravel layers, and through bedrock fractures and joints. Groundwater flow in an urban setting can be interrupted by the presence of pumping stations, building foundations, utilities, retaining walls, or other buried structures.

Stratigraphy

The generalized stratigraphy underlying the Site is composed of a surficial layer of historic fill overlying natural sand, organic material and clay followed by bedrock. The surficial fill layer extends approximately 7 to 10 ft below surface grade and predominately comprises varying sand, silt, gravel, cobbles, wood and brick fragments, and coal. The historic fill layer is underlain by medium-grained sands and silts from 7 to 10 ft bgs to approximately 12 to 15 ft bgs. Clay (potential confining layer) with some organic material was identified at approximately 12 to 15 ft bgs extending to the bottom of all borings. Bedrock was not encountered during this investigation; however, based on previous geotechnical investigation at the site bedrock ranges from 20 to 45 ft bgs. Visual and olfactory evidence of petroleum impacts was observed in borings EB-18 and DB-2 from surface grade to approximately the groundwater table.

Hydrogeology

Groundwater underlying the Site ranged from approximately 8 to 13 ft below the current site grade (approximately el 0.7 to el 3.0) based on a synoptic gauging event of ten site wells on August 29, 2012. Groundwater elevation data recorded during the RI are summarized in Table 5. A groundwater elevation iso-contour map, based on representative groundwater

elevations recorded from Site monitoring wells, is provided as Figure 9. Regional topography and RI groundwater elevation data indicates that the groundwater flow at the Site is in a westerly direction towards the Hudson River. According to the Sanitary and Topographical Map of the City and Island of New York by E.G. Viele (1865), a former stream traverses through the northern side of the site. Groundwater flow is presumed to follow this historic river course in a westerly direction. The historic shoreline of the Hudson River is roughly located along the High Line, with the majority of the site being located in the former river bed. The historic Viele map is included as Figure 3. No free product was observed during gauging and sampling activities. A PID reading of 3.0 ppm was recorded at W-7; however the reading was attributed to spray painting activities in the auto repair shop.

5.2 Soil Chemistry

This section summarizes soil sample results reported in the Phase II Report prepared by GZA in December 2007 and soil sample results collected as part of this RI. A total of 55 grab soil samples were collected during the 2007 Phase II. A total of 117 grab soil samples and 14 composite soil samples were collected during the RI. A summary of soil sample laboratory detections, collected during the RI, with comparison to the Unrestricted Use and Restricted Residential SCOs is provided in Tables 6A through 6E, Tables 7A and 7B, and Table 8. Complete laboratory analytical reports are provided in Appendix H. Soil SCO exceedances are shown on Figures 10, 11, and 12. Data collected during the RI is sufficient to delineate the vertical and horizontal distribution of contaminants in soil/fill at the Site. The following is a summary of SCO exceedances organized by sample type and analytical parameter. Exceedances of Unrestricted Use SCOs are listed below, while exceedances of Restricted Residential Use SCOs are in **bold**.

Site/Waste Characterization

VOCs –

- acetone
- cis-1,2-dichloroethene
- methylene chloride
- **tetrachloroethene**
- vinyl chloride
- 1,4 dioxane

Total VOCs ranged from non-detect to 40.1 mg/kg with the highest total VOCs located beneath the High Line (AOC 2 borings SB-10 and SB-11). Tetrachloroethene (from 5 to 40 ppm) was the only VOC exceedance of Restricted Residential Use SCOs in five soil samples. Three highest PCE exceedances were limited to the area of the Site under the High Line (AOC 2). Two lower values of PCE (5 ppm and 9.4 ppm) were located in area close to 28th Street side. All PCE exceedances were limited to the shallow soil sample (depth of five feet or less) with deeper samples below Unrestricted Use SCOs. Vinyl chloride (maximum of 0.14 ppm) and cis-1,2-dichloroethene (maximum of 0.52 ppm) are chlorinated solvent breakdown products and were identified above Unrestricted Use SCOs. 1,4 dioxane (maximum of 2.4 ppm) is a stabilizer for the solvent trichloroethane. The solvents identified in soil are

attributed to historic operations at the Site. Acetone and vinyl chloride are common laboratory contaminants.

SVOCs –

- **phenanthrene**
- **benzo(a)anthracene**
- **benzo(a)pyrene**
- **dibenzo(a,h)anthracene**
- **pyrene**
- **benzo(b)fluoranthene**
- **benzo(k)fluoranthene**
- **chrysene**
- **fluoranthene**
- **ideno(1,2,3-cd)pyrene**
- naphthalene
- fluorene
- acenapthene
- dibenzofuran

Highest total SVOCs (3,161 mg/kg)were located in shallow fill location beneath the High Line (AOC 2 boring SB-11). Multiple SVOCs were detected in soil above the Restricted Residential Use SCOs across the site (AOC1 and AOC-2). These site-wide exceedances are attributed to fill material that was identified from surface grade to approximately 7 to 10 ft bgs. No exceedances of Unrestricted Use SCOs were identified in soil samples collected deeper than 10 feet bgs with the exception of SB-11.

Metals –

- **arsenic**
- **barium**
- **copper**
- nickel
- **lead**
- **mercury**
- **cadmium**
- silver
- zinc
- chromium (trivalent)

Multiple metals were detected in soil above the Restricted Residential Use SCOs across the Site (AOC 1 and AOC 2). Metal concentration ranges included: arsenic (non-detect to 68 mg/kg), barium (20 to 1470 mg/kg), copper (non-detect to 550 mg/kg), lead (non-detect to 2,490 mg/kg), mercury (non-detect to 39 mg/kg) and cadmium (non-detect to 4.7 mg/kg). Highest mercury concentration was detected underneath the highline in boring SB-10. These site-wide metal exceedances are attributed to fill material that was identified from surface grade to approximately 7 to 10 ft bgs. Metal (lead and barium) exceedances of Restricted Residential Use SCOs were identified in one soil sample collected deeper than 10 feet bgs.

PCBs-

- **aroclor 1254**

No PCBs were detected in grab soil samples collected at the site. Aroclor 1254 was detected at 16.4 mg/kg in one composite sample collected from the 0 to 7 ft depth on Lot 34.

Pesticides-

- 4,4'-DDE
- Dieldrin
- 4,4'-DDD
- 4,4'-DDT

Four pesticides were detected above Unrestricted Use SCOs; however, there were no pesticides identified above Restricted Residential SCOs.

Toxicity- TCLP lead above RCRA hazardous waste regulatory levels for toxicity characteristics was identified in one composite sample collected from the 0 to 7 ft interval along the northern portion of Lots 42, 44 and 45.

Endpoint

VOCs –

- Acetone
- vinyl chloride

No VOC exceedances of Restricted Residential Use SCOs were identified in endpoint soil samples.

SVOCs - No SVOC exceedances were identified in endpoint soil samples.

Metals-

- Chromium

No metal exceedances of Restricted Residential Use SCOs were identified in endpoint soil samples.

PCBs- No PCB detections were identified in endpoint soil samples.

Pesticides- No pesticide exceedances were identified in endpoint soil samples.

Delineation

VOCs-

- Acetone
- cis-1,2-dichloroethene
- 1,4-dioxane
- vinyl chloride

No VOCs were detected above Restricted Residential Use SCOs in delineation soil samples.

Mercury-

- **mercury**

Mercury was detected above Restricted Residential Use SCOS in two delineation soil samples; however both samples were below Restricted Commercial Use SCOs.

5.3 Groundwater Chemistry

Ten groundwater samples were analyzed for VOCs, SVOCs, metals (filtered and unfiltered), PCBs and pesticides during the RI. A summary of the RI groundwater sample laboratory detections is presented in Tables 9A and 9B. Groundwater sample locations and exceedances are presented in Figure 13 and 14. Complete laboratory analytical reports are provided in Appendix I. Data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site. The following is a summary of New York State 6NYCRR Part 703.5 New York State Department of Conservation Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS) for Class GA groundwater exceedances organized by contaminant class.

VOCs–

- 1,1, dichloroethane
- tetrachloroethene,
- 1,1,1-trichloroethane
- benzene
- o xylene
- 1,2,4-trimethylbenzene
- Toluene
- ethylbenzene
- vinyl chloride
- chloroethane
- cis-1,2-dichloroethene
- MTBE
- 1,1-dichloroethene
- trans-1,2-dichloroethene
- trichloroethene
- p/m xylene
- naphthalene

Multiple VOC exceedances were identified in groundwater across the site (AOC 1 and AOC 2). Total VOCs ranged from 0.71 ug/l to 6,269 ug/l. Total chlorinated solvents ranged from 8.7 ug/l to 6,159 ug/l. Chlorinated solvents and breakdown products were identified in up-gradient well locations at the eastern perimeter of the site, and thus groundwater contamination at the site is in part due to an offsite condition (AOC 3). Chlorinated solvent parent (PCE detected at maximum of 50 ug/l and TCE detected at maximum of 21 ug/l) concentrations in groundwater are highest beneath the High Line structure corresponding with AOC 2. Chlorinated solvent breakdown products (vinly chloride detected at maximum of 1,200 ug/l and Cis 1,2-Dichloroethene detected at maximum of 5,200 ug/l) in groundwater at the Site are highest down-gradient of the High Line structure, corresponding with AOC 1. Naphthalene was also detected at a maximum concentration of 120 ug/l. Chlorinated solvents in groundwater at the Site are attributed to offsite sources and potential releases related to historic site operations. MTBE was identified above the TOGS Class GA concentration at one well in the 2007 Phase II investigation; however, it was not detected above the TOGS concentration during the RI.

SVOCs–

- phenol
- naphthalene
- bis(2-ethylhexyl)phthalate
- benzo(b)fluoranthene
- chrysene
- benzo(k)fluoranthene
- ideno(1,2,3-cd)pyrene
- benzo(a)pyrene

Multiple SVOC exceedances were identified in groundwater across the Site corresponding with AOC 1 and AOC 2. Total SVOCs ranged from below detection limit to 35.03 ug/l. SVOCs in groundwater are considered a regional condition and are attributed to the historic fill at the Site.

Metals–
Ranges of filtered metal concentrations (with exceedances at one or more locations) are shown below.

- aluminum (non-detect to 15,000 ug/l)
- antimony (non-detect to 22.4 ug/l)
- arsenic (non-detect to 45 ug/l)
- iron (non-detect to 58,000 ug/l)
- lead (non-detect to 29 ug/l)
- magnesium (193 to 78,000 ug/l)
- manganese (1.7 to 7,960 ug/l)
- sodium (14,500 to 630,000 ug/l)

An offsite well adjacent to the south along West 28th Street (MW-10) also had exceedances of nickel, copper, chromium, beryllium, barium and vanadium. Metal AWQS exceedances, although generally lower in the filtered samples, are distributed throughout groundwater at the Site are likely associated with the dissolved naturally occurring mineral constituents from regional soil or quality of the fill.

PCBs – No PCB detections in groundwater at the Site.

Pesticides – No pesticide exceedances in groundwater at the Site.

5.4 Soil Vapor Chemistry

Ten soil vapor samples were collected during the RI. A summary of soil vapor and ambient air analytical results are presented in Table 10. Soil vapor sample locations and results are presented in Figure 15. Soil vapor analytical results were compared to NYSDOH Final Guidance on Soil Vapor Intrusion (October 2006) values (AGVs), NYSDOH Fuel Oil Indoor Air Upper Fence Values, U.S. EPA 2001 Base Database: 90th Percentile Values for Indoor Air, and the HEI 2005 95th Percentile Values for Indoor Air.

Tetrachloroethene and trichloroethene were detected above the NYSDOH AGVs at multiple locations corresponding with AOC 1, AOC 2 and AOC 3. Tetrachloroethene was detected in the range from 2.5 µg/m^3 to 16,300 µg/m^3 and trichloroethene was detected in the range from 1.36 µg/m^3 to 372 µg/m^3, with the greatest concentrations of these compounds identified beneath the High Line (AOC 2). Total soil vapor VOCs ranged from 342 µg/m^3 at SV-4 to 143,646 µg/m^3 at SV-3. Highest VOCs concentration is due to detection of Freon in one sample at a concentration of 143,000 µg/m^3. The total VOCs detected in the ambient air samples ranged from 42.54 to 83.04 µg/m^3. Contaminant concentrations in soil vapor are likely attributed to the historic and current use at the Site and surrounding properties. Data collected during the RI is sufficient to delineate the distribution of contaminants in soil vapor at the Site.

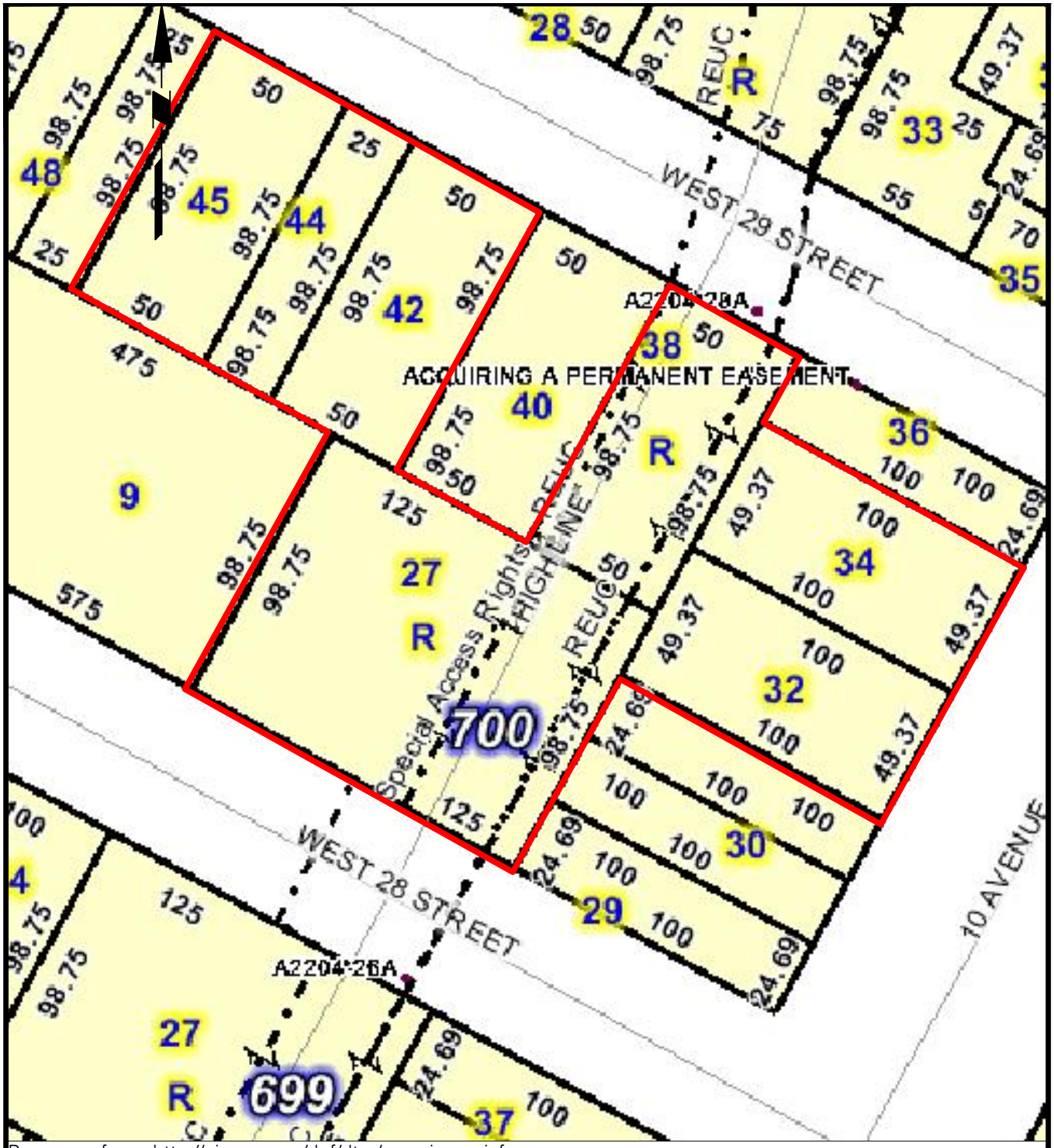
5.5 Quality Control Samples

Duplicate soil and groundwater sample analytical results are included with their parent samples in Tables 7A, 7B, 9A and 9B and the ambient air analytical results are shown with soil vapor in Table 10. Trip blank results are included in the laboratory analytical reports which are included as Appendix I.

5.6 Impediments to Remedial Action

Possible impediments to remedial action at the property include the High Line structure, adjacent buildings, streets and sidewalks.

FIGURES



Base map from: http://gis.nyc.gov/dof/dtm/mapviewer.jsf

LEGEND

APPROXIMATE SITE BOUNDARY

50 0 25 50

SCALE IN FEET

DRAFT

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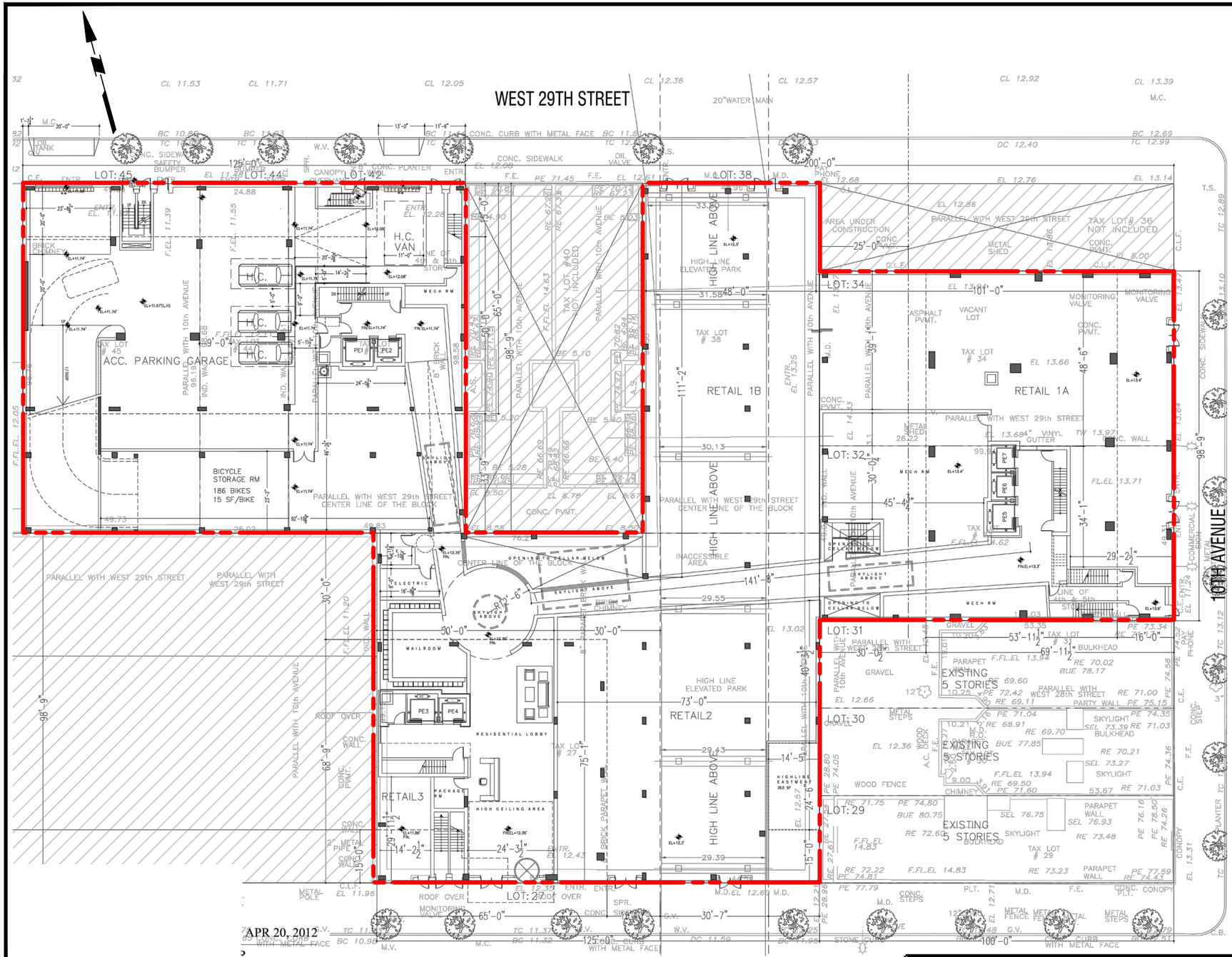
HIGHLINE 28–29 DEVELOPMENT

NEW YORK CITY TAX MAP

MANHATTAN NEW YORK

Project No.	Date	Scale	Dwg. No.
170190002	9/26/2012	1" = 50'	1

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data – 170190002\SIR\Figure 1– New York City Tax Map.dwg Date: 1/3/2013 Time: 17:30 User: jgood Style Table: Langan.stb Layout: New York City Tax Map



GENERAL NOTES

1. BASE PLAN A101.00 1ST FLOOR PLAN PREPARED BY AVINASH K. MALHOTRA ARCHITECTS, DATED APRIL 20, 2012.
2. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).

LEGEND:

DEVELOPMENT FOOTPRINT

DRAFT

30 0 15 30
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REDEVELOPMENT PLAN

MANHATTAN NEW YORK

Project No.	Date	Scale	Dwg. No.
170190002	9/26/2012	1"=30'	4

GENERAL NOTES

1. BASE PLAN TAKEN FROM http://www/oasisnyc.net

LEGEND:

DEVELOPMENT FOOTPRINT

LAND USE LEGEND:

- 1 & 2 FAMILY RESIDENTIAL
- MULTI-FAMILY RESIDENTIAL
- MIXED USE
- OPEN SPACE & OUTDOOR RECREATION
- COMMERCIAL
- INSTITUTIONS
- INDUSTRIAL
- PARKING
- TRANSPORTATION/UTILITIES
- VACANT LOTS

DRAFT

80 0 40 80
SCALE IN FEET

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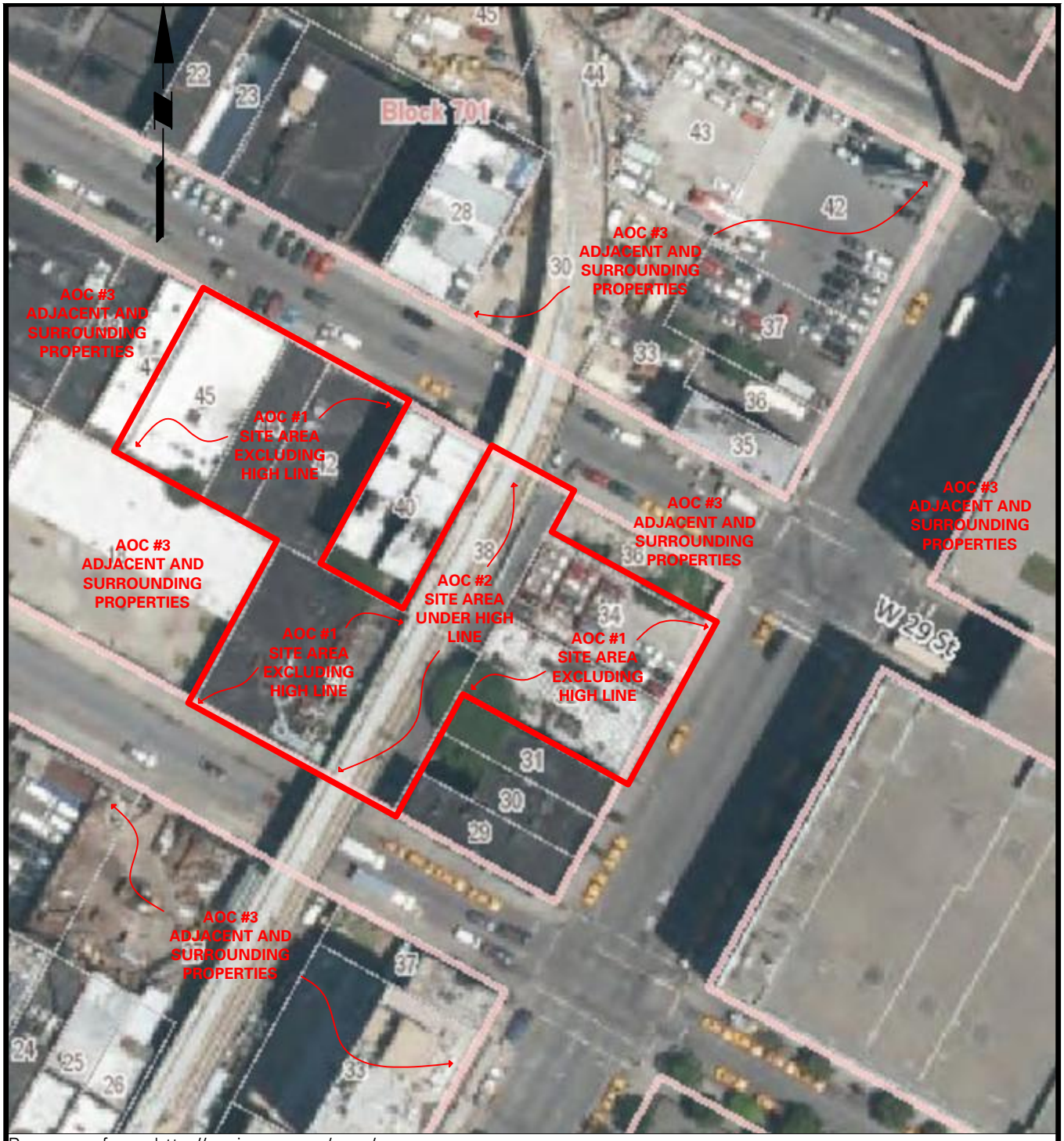
SURROUNDING LAND USE PLAN

MANHATTAN NEW YORK

Project No.	Date	Scale	Dwg. No.
170190002	12/12/2012	1"=80'	5

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data – 170190002\SIR\Figure 5– Surrounding Land Use.dwg Date: 1/4/2013 Time: 08:35 User: jgood Style Table: Langan.stb Layout: Figure 5– Surrounding Land Use



Base map from: http://oasisnyc.com/map/aspx

LEGEND

APPROXIMATE SITE BOUNDARY

AOC — AREA OF CONCERN

80 0 20 50 80

SCALE IN FEET

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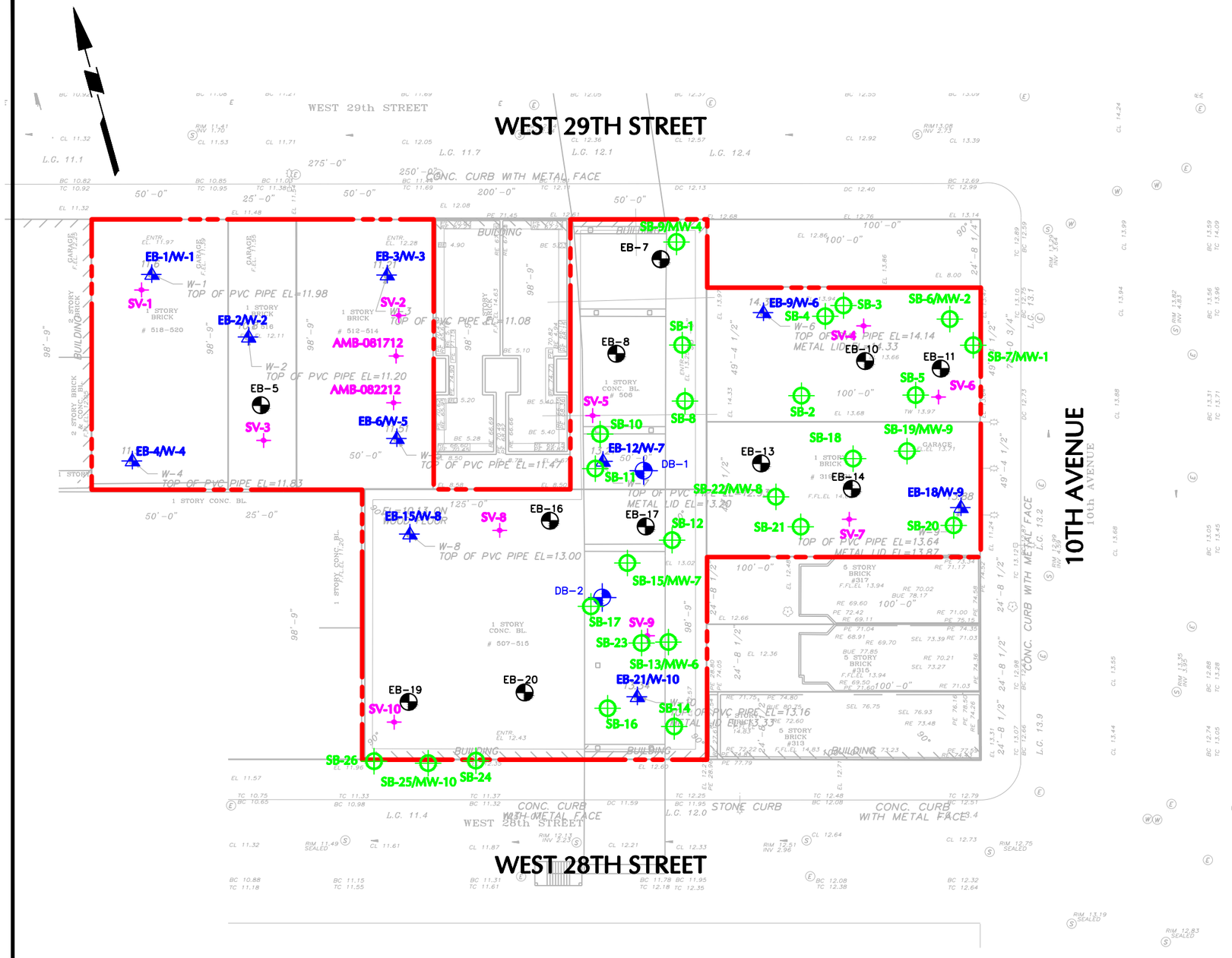
AREAS OF CONCERN LOCATION MAP

MANHATTAN NEW YORK

Project No.	Date	Scale	Dwg. No.
170190002	12/12/2012	1" = 80'	6

e: \\langan.com\data\NY\data0\170190002\Cadd Data – 170190002\SIR\Figure 6– Areas of Concern Location Map.dwg Date: 1/4/2013 Time: 08:47 User: jgood Style Table: Langan.stb Layout: Areas Of Concern Location Map



GENERAL NOTES

1. BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).
3. ALL BORING LOCATIONS ARE APPROXIMATE

LEGEND:

- EB-1/W-1 — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012
- EB-5 — BORING LOCATION - LANGAN AUGUST 2012
- SV-1 — SOIL VAPOR/ AMBIENT AIR LOCATION - LANGAN AUGUST 2012
- SB-9/MW-4 — BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007
- DB-1 — DELINEATION BORING- LANGAN AUGUST 2012
- DEVELOPMENT FOOTPRINT

DRAFT

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SCALE IN FEET

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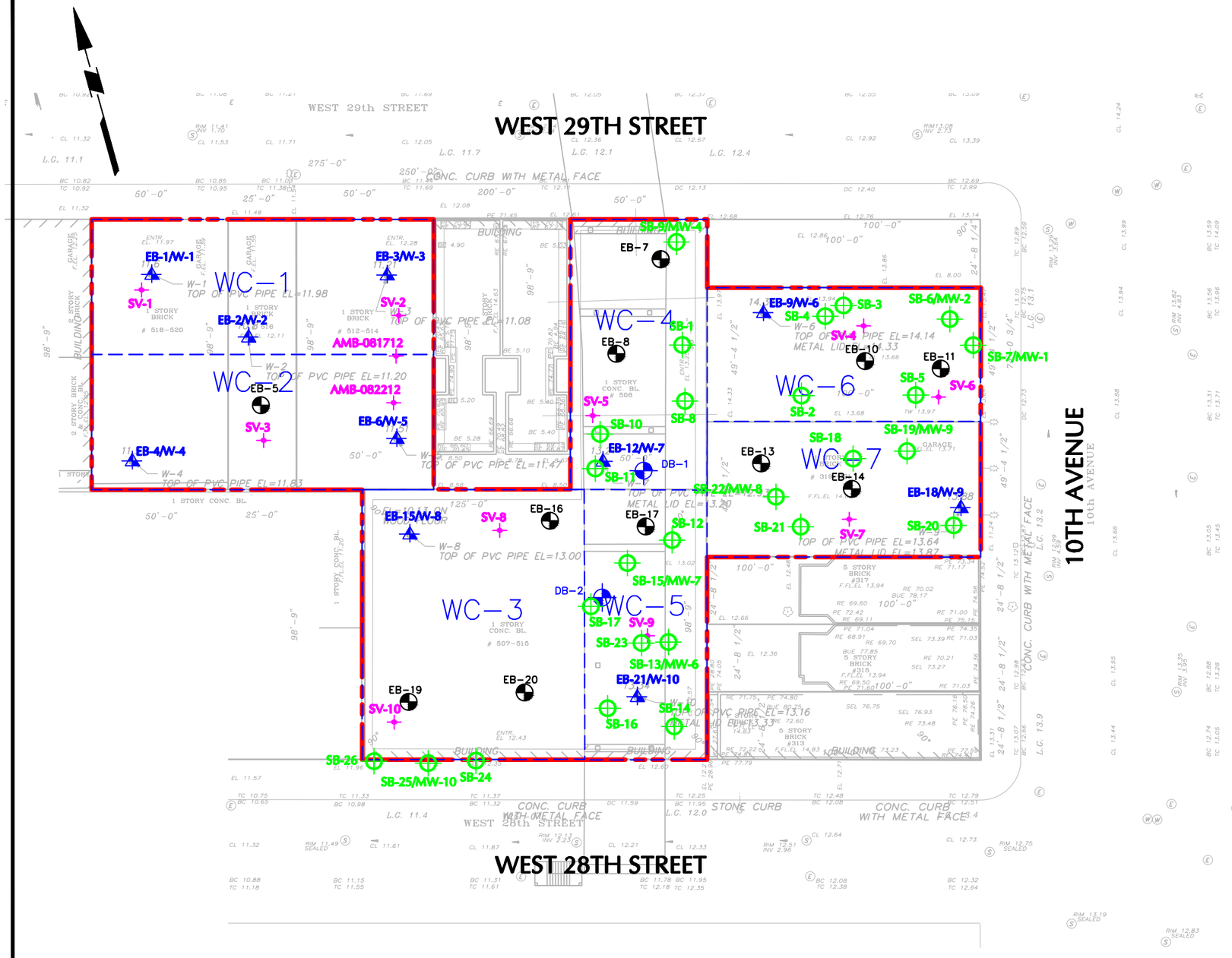
COMPREHENSIVE BORING AND WELL LOCATION PLAN

MANHATTAN NEW YORK

Project No.	Date	Scale	Dwg. No.
170190002	12/12/2012	1"=40'	7

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data – 170190002\SIR\Figure 7 – Comprehensive Boring and Well Location Plan.dwg Date: 1/4/2013 Time: 14:20 User: jgood Style Table: Langan.stb Layout: Figure 5– Boring Plan B Size Sheet (Bottom)



GENERAL NOTES

1. BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).
3. ALL BORING LOCATIONS ARE APPROXIMATE

LEGEND:

- EB-1/W-1 — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012
- EB-5 — BORING LOCATION - LANGAN AUGUST 2012
- SV-1 — SOIL VAPOR/ AMBIENT AIR LOCATION - LANGAN AUGUST 2012
- SB-9/MW-4 — BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007
- DEVELOPMENT FOOTPRINT
- DB-1 — DELINEATION BORING- LANGAN AUGUST 2012
- WC-1 — WASTE CHARACTERIZATION GRID

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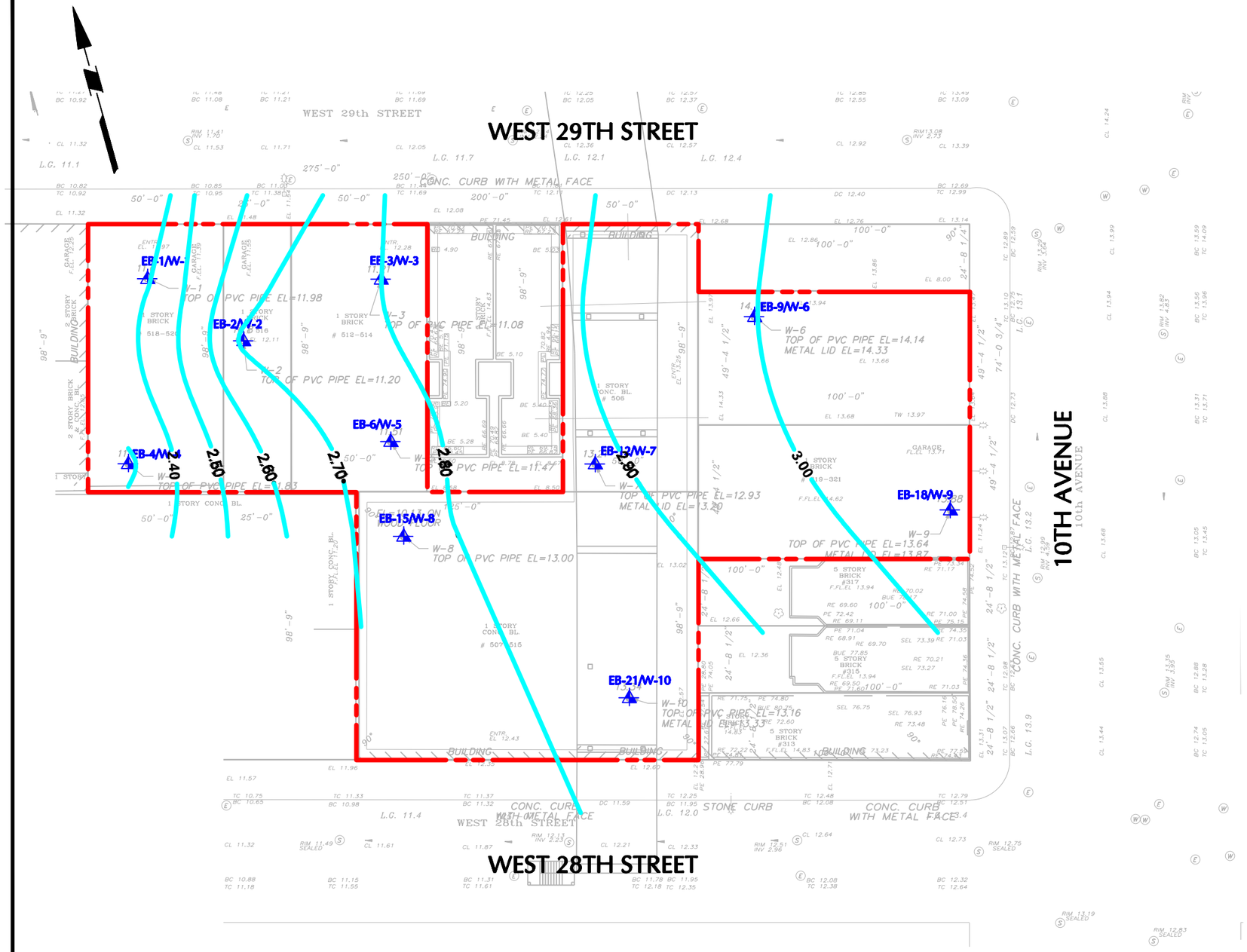
WASTE CHARACTERIZATION GRID PLAN

MANHATTAN — NEW YORK

Project No.	Date	Scale	Dwg. No.
170190002	12/12/2012	1"=40'	8

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data - 170190002\SIR\Figure 8- Waste Characterization Grid Plan.dwg Date: 1/4/2013 Time: 14:14 User: jgood Style Table: Langan.stb Layout: Figure 8- Waste Characterization Grid Plan



GENERAL NOTES

1. BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).
3. ALL BORING LOCATIONS ARE APPROXIMATE
4. GROUNDWATER CONTOUR BASED ON SYNOPTIC GROUNDWATER MEASUREMENTS ON AUGUST 29, 2012.
5. GROUNDWATER MONITORING WELLS W-7, W-8 AND W-10 WERE EXCLUDED FROM THE GROUNDWATER CONTOUR MAP. W-7, W-8 AND W-10 HAD VERY POOR RECHARGE COMPARED WITH OTHER SITE WELL AND SHOWED INCONSISTENT WATER LEVEL READINGS AS COMPARED WITH OTHER SITE WELLS AND HISTORIC WATER LEVEL READINGS IN THE AREA.

LEGEND:

EB-1/W-1 — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012

DEVELOPMENT FOOTPRINT

3.00 — GROUNDWATER ELEVATION CONTOUR

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GROUNDWATER CONTOUR PLAN

MANHATTAN — NEW YORK

Project No.	Date	Scale	Dwg. No.
170190002	12/12/2012	1"=40'	9

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data – 170190002\SIR\Figure 9 – Groundwater contour.dwg Date: 1/4/2013 Time: 09:04 User: jgood Style Table: Langan.stb Layout: Figure 6– Groundwater Contour Plan–B Size Sheet (Bottom)

EB-12				
SAMPLE ID	WCH2-0-6	EP9-5-7	SB12-13-15	SB12-15-17
SAMPLING DATE	8/20/2012	8/20/2012	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	2-4	5-7	13-15	15-17
VOC (mg/kg)				
1,4-Dioxane	ND	ND	0.42 J	NE
Acetone	ND	NE	**0.54**	NE
cis-1,2-Dichloroethene	NE	NE	**0.38**	NE
Methylene chloride	0.22 J	ND	NE	NE
Tetrachloroethene	**9.6**	NE	NE	NE

SB-10		
LOCATION	SB-10 (0-2')	SB-10 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
VOC (mg/kg)		
Acetone	ND	**0.052**
Tetrachloroethylene	**40.1**	ND

DB-1				
SAMPLE ID	D3-0-2	D3-7-9	DB1-13-15	DB1-15-17
SAMPLING DATE	8/20/2012	8/20/2012	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	0-2	7-9	13-15	15-17
VOC (mg/kg)				
1,4-Dioxane	NA	NA	**0.4**	**0.21**
Acetone	NA	NA	**0.36**	**0.35**
cis-1,2-Dichloroethene	NE	NE	**0.49**	NE

EB-7				
SAMPLE ID	WC4-0-6	EP6-5-7	SB7-13-15	SB7-15-17
SAMPLING DATE	8/20/2012	8/20/2012	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	3-5	5-7	13-15	15-17
VOC (mg/kg)				
Acetone	NE	NE	NE	**0.074**

SB-1			
SAMPLE ID	SB-1 (0-2')	SB-1 (13-14')	SB-1 (15-17')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14	15-17
VOC (mg/kg)			
Acetone	ND	**0.0892**	**0.0917**

SB-4		
LOCATION	SB-4 (0-2')	SB-4 (12-13')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	12-13
VOC (mg/kg)		
VOCs	ND	ND

SB-6		
LOCATION	SB-6 (0-2')	SB-6 (13-14')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14
VOC (mg/kg)		
Acetone	NE	**0.075**

SB-11		
LOCATION	SB-11 (0-2')	SB-11 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
VOC (mg/kg)		
Tetrachloroethylene	**39.1**	ND

EB-8				
SAMPLE ID	D2-0-2	D2-7-9	SB8-13-15	SB8-15-17
SAMPLING DATE	8/20/2012	8/20/2012	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	0-2	7-9	13-15	15-17
VOC (mg/kg)				
Acetone	NA	NA	NE	**0.098**

SB-9		
LOCATION	SB-9 (0-2')	SB-9 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
VOC (mg/kg)		
Acetone	ND	**0.051**

SB-8		
LOCATION	SB-8 (0-2')	SB-8 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
VOC (mg/kg)		
VOCs	ND	ND

SB-3		
LOCATION	SB-3 (0-2')	SB-3 (12-13')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	12-13
VOC (mg/kg)		
VOCs	ND	ND

SB-7		
LOCATION	SB-7 (0-2')	SB-7 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
VOC (mg/kg)		
VOCs	ND	ND

EB-3			
SAMPLE ID	WC1-7-14	EP3-13-15	SB3-15-17
SAMPLING DATE	8/15/2012	8/15/2012	8/15/2012
SAMPLE DEPTH (feet)	12-14	13-15	15-17
VOC (mg/kg)			
VOC	NE	NE	NE

EB-9		
SAMPLE ID	WC6-0-7	EP7-13-15
SAMPLING DATE	8/16/2012	8/16/2012
SAMPLE DEPTH (feet)	3-5	13-15
VOC (mg/kg)		
VOC	NE	NE

EB-13			
SAMPLE ID	WC7-7-14	EP10-13-15	SB13-15-17
SAMPLING DATE	8/17/2012	8/17/2012	8/17/2012
SAMPLE DEPTH (feet)	12-14	13-15	15-17
VOC (mg/kg)			
Acetone	**0.083**	**0.053**	**0.053**

EB-11		
SAMPLE ID	WC6-7-14	EP8-13-15
SAMPLING DATE	8/16/2012	8/16/2012
SAMPLE DEPTH (feet)	8-10	13-15
VOC (mg/kg)		
VOC	NE	NE

EB-1				
		DUPLICATE		
SAMPLE ID	WC1-0-7	EP1-13-15	DUP1-8-20-12	SB1-15-17
SAMPLING DATE	8/20/2012	8/20/2012	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	2-4	13-15	13-15	15-17
VOC (mg/kg)				
VOC	NE	NE	NE	NE

SB-2		
LOCATION	SB-2 (0-2')	SB-2 (13-14')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14
VOC (mg/kg)		
VOCs	ND	ND

SB-5			
SAMPLE ID	SB-5 (0-2')	SB-5 (9-10')	SB-5 (18-20')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10	18-20
VOC (mg/kg)			
Acetone	ND	ND	**0.115**

SB-18		
LOCATION	SB-18 (0-2')	SB-18 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
VOC (mg/kg)		
VOCs	ND	ND

EB-2			
	DUPLICATE		
SAMPLE ID	EP2-13-15	DUP2-8-20-12	SB2-15-17
SAMPLING DATE	8/20/2012	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	13-15	13-15	15-17
VOC (mg/kg)			
Acetone	ND	ND	**0.088**
cis-1,2-Dichloroethene	NE	NE	**0.47**
Vinyl chloride	NE	**0.034**	**0.11**

SB-19			
			DUPLICATE
SAMPLE ID	SB-19 (0-2')	SB-19 (12-14')	SB-19 (13-14') DUP
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14	13-14
VOC (mg/kg)			
Acetone	ND	ND	**0.074**

EB-5		
SAMPLE ID	SB5-13-15	SB5-15-17
SAMPLING DATE	8/17/2012	8/17/2012
SAMPLE DEPTH (feet)	13-15	15-17
VOC (mg/kg)		
Acetone	NE	**0.099**

EB-14			
SAMPLE ID	WC7-0-7	SB14-13-15	SB14-15-17
SAMPLING DATE	8/17/2012	8/17/2012	8/17/2012
SAMPLE DEPTH (feet)	3-5	13-15	15-17
VOC (mg/kg)			
Acetone	ND	**0.081**	NE

EB-6			
SAMPLE ID	WC2-7-14	EP5-13-15	SB6-15-17
SAMPLING DATE	8/15/2012	8/15/2012	8/15/2012
SAMPLE DEPTH (feet)	12-14	13-15	15-17
VOC (mg/kg)			
cis-1,2-Dichloroethene	**0.29**	ND	NE
Vinyl chloride	**0.14**	ND	ND

EB-4				
SAMPLE ID	WC2-0-7	EP4-13-15	SB4-15-17	
SAMPLING DATE	8/17/2012	8/17/2012	8/17/2012	
SAMPLE DEPTH (feet)	3-5	13-15	15-17	
VOC (mg/kg)				
Vinyl chloride	ND	**0.026**	NE	

EB-15		
SAMPLE ID	WC3-7-14	EP11-13-15
SAMPLING DATE	8/14/2012	8/14/2012
SAMPLE DEPTH (feet)	11-13	13-15
VOC (mg/kg)		
cis-1,2-Dichloroethene	**0.52**	ND

EB-16			
SAMPLE ID	D4-7-9	SB16-9-11	EP12-13-15
SAMPLING DATE	8/15/2012	8/15/2012	8/15/2012
SAMPLE DEPTH (feet)	7-9	9-11	13-15
VOC (mg/kg)			
VOC	NE	NE	NE

SB-12		
LOCATION	SB-12 (0-2')	SB-12 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
VOC (mg/kg)		
VOCs	NE	ND

SB-21		
LOCATION	SB-21 (0-2')	SB-21 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
VOC (mg/kg)		
VOCs	ND	ND

SB-22	
LOCATION	SB-22 (0-2')
SAMPLING DATE	10/30/2007
SAMPLE DEPTH (feet)	0-2
VOC (mg/kg)	
VOCs	NE

EB-17		
SAMPLE ID	SB17-13-15	SB17-15-17
SAMPLING DATE	8/22/2012	8/22/2012
SAMPLE DEPTH (feet)	13-15	15-17
VOC (mg/kg)		
1,4-Dioxane	**2.4**	**1.8**
Acetone	**0.48**	**0.1**

SB-15		
LOCATION	SB-15 (0-2')	SB-15 (10-12')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-12
VOC (mg/kg)		
VOCs	NE	ND

SB-17			
		DUPLICATE	
SAMPLE ID	SB-17 (0-2')	SB-17 (0-2') DUP	SB-17 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	0-2	10-11
VOC (mg/kg)			
VOCs	NE	NE	ND

DB-2		
SAMPLE ID	DB2-10-12	DB2-15-17
SAMPLING DATE	8/22/2012	8/22/2012
SAMPLE DEPTH (feet)	10-12	15-17
VOC (mg/kg)		
Acetone	ND	**0.15**

EB-19			
SAMPLE ID	WC3-0-7	SB19-11-13	EP14-13-15
SAMPLING DATE	8/14/2012	8/14/2012	8/14/2012
SAMPLE DEPTH (feet)	3-5	11-13	13-15
VOC (mg/kg)			
Methylene chloride	0.16 J	NE	NE
Tetrachloroethene	**5**	ND	ND

SB-26			
SAMPLE ID	SB-26 (0-2')	SB-26 (11-12')	SB-26 (15-17')
SAMPLING DATE	11/15/2007	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12	15-17
VOC (mg/kg)			
Acetone	**0.058**	ND	**0.728**

SB-24		
LOCATION	SB-24 (0-2')	SB-24 (11-12')
SAMPLING DATE	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12
VOC (mg/kg)		
Acetone	**0.053**	**0.065**

SB-16		
LOCATION	SB-16 (0-2')	SB-16 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
VOC (mg/kg)		
VOCs	NE	NE

SB-14		
LOCATION	SB-14 (0-2')	SB-14 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
VOC (mg/kg)		
VOCs	NE	ND

SB-13			
SAMPLE ID	SB-13 (0-2')	SB-13 (10-11')	SB-13 (15-17')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11	15-17
VOC (mg/kg)			
VOCs	NE	ND	NE

SB-25		
LOCATION	SB-25 (0-2')	SB-25 (11-12')
SAMPLING DATE	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12
VOC (mg/kg)		
Acetone	ND	**0.0862**

EB-20			
SAMPLE ID	SB20-11-13	EP15-13-15	
SAMPLING DATE	8/14/2012	8/14/2012	
SAMPLE DEPTH (feet)	11-13	13-15	
VOC (mg/kg)			
Acetone	**0.12**	ND	

EB-21				
SAMPLE ID	WC5-0-6	EP16-5-7	SB21-13-15	SB21-15-17
SAMPLING DATE	8/21/2012	8/20/2012	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	3-5	5-7	13-15	15-17
VOC (mg/kg)				
Methylene chloride	0.24 J	ND	ND	ND
Tetrachloroethene	**9.4**	NE	NE	NE

ANALYTE	NYSDEC PART 375 UNRESTRICTED USE SOIL CLEANUP OBJECTIVES	NYSDEC PART 375 RESTRICTED USE RESIDENTIAL SOIL CLEANUP OBJECTIVE
VOC (mg/kg)		
Acetone	0.05	100
1,4-Dioxane	0.1	9.8
2-Butanone	0.12	100
Acetone	0.05	100
cis-1,2-Dichloroethene	0.25	59
Methylene chloride	0.05	51
Tetrachloroethene	1.3	5.5
Vinyl chloride	0.02	0.21

WEST 29TH STREET

WEST 28TH STREET

10TH AVENUE

CONC. CURB WITH METAL FACE

CONC. CURB WITH METAL FACE

STONE CURB

BUILDING

1 STORY BRICK

5 STORY BRICK

6 STORY BRICK

EB-1/W-1

EB-2/W-2

EB-3/W-3

EB-4/W-4

EB-5

EB-6/W-5

EB-7

EB-8

EB-9/W-6

EB-10

EB-11

EB-12/W-7

EB-13

EB-14

EB-15/W-8

EB-16

EB-17

EB-18/W-9

EB-19

EB-20

EB-21/W-10

SB-1

SB-2/MW-3

SB-3

SB-4

SB-5

SB-6/MW-2

SB-7/MW-1

SB-8/MW-5

SB-9/MW-4

SB-10

SB-11

SB-12

SB-13/MW-6

SB-14

SB-15/MW-7

SB-16

SB-17

SB-18

SB-19/MW-9

SB-20

SB-21

SB-22/MW-8

SB-23

SB-24

SB-25/MW-10

SB-26

DB-1

DB-2

SV-1

SV-2

SV-3

SV-4

SV-5

SV-6

SV-7

SV-8

SV-9

SV-10

W-1 TOP OF PVC PIPE EL=11.98

W-2 TOP OF PVC PIPE EL=11.20

W-4 TOP OF PVC PIPE EL=11.83

W-5 TOP OF PVC PIPE EL=11.47

W-6 TOP OF PVC PIPE EL=14.14 METAL LID EL= 13.97

W-7 TOP OF PVC PIPE EL=13.64 METAL LID EL= 13.47

W-8 TOP OF PVC PIPE EL=13.70

W-9 TOP OF PVC PIPE EL=13.64 METAL LID EL= 3.29

W-10 TOP OF PVC PIPE EL=13.64 METAL LID EL= 13.47

LEGEND:

EB-1/W-1 BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012

EB-5 BORING LOCATION - LANGAN AUGUST 2012

SV-1 SOIL VAPOR LOCATION - LANGAN AUGUST 2012

SB-9/MW-4 BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007

DEVELOPMENT FOOTPRINT

30 0 15 30

SCALE IN FEET

GENERAL NOTES

1. BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TITLE 6 OF THE OFFICIAL COMPILATION OF NEW YORK CODES, RULES, AND REGULATION (NYCRR) PART 375 UNRESTRICTED AND RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (SCO).
3. ONLY EXCEEDANCES ARE SHOWN ON FIGURE.
4. 6 NYCRR PART 375 UNRESTRICTED USE EXCEEDANCES ARE BOLDED.
5. 6 NYCRR PART 375 RESTRICTED RESIDENTIAL EXCEEDANCES ARE BOLDED AND UNDERLINED.
6. NONE OF THE SAMPLES ANALYZED FOR TCLP VOCs EXCEEDED RCRA HAZARDOUS WASTE REGULATORY LEVELS FOR TOXICITY CHARACTERISTICS.
7. SOIL BORING SB-23 WAS NOT SAMPLED DUE TO REFUSAL AT 4 FEET BGS.
8. SOIL BORING EB-10 WAS NOT SAMPLED FOR VOCs.
9. VOC = VOLATILE ORGANIC COMPOUNDS
10. mg/kg = MILLIGRAMS PER KILOGRAM
11. NE = NO EXCEEDANCE
12. ND = NO DETECTION
13. J = ANALYTE WAS DETECTED ABOVE THE METHOD DETECTION LIMIT BUT BELOW THE REPORTING LIMIT. THE RESULT IS AN ESTIMATED CONCENTRATION.
14. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).
15. ALL BORING LOCATIONS ARE APPROXIMATE.

DRAFT

Date	Description	No.
Revisions		

NAME
PROFESSIONAL XXXXXXXXXXXXX N.J. LIC. No.XXXXX DATE

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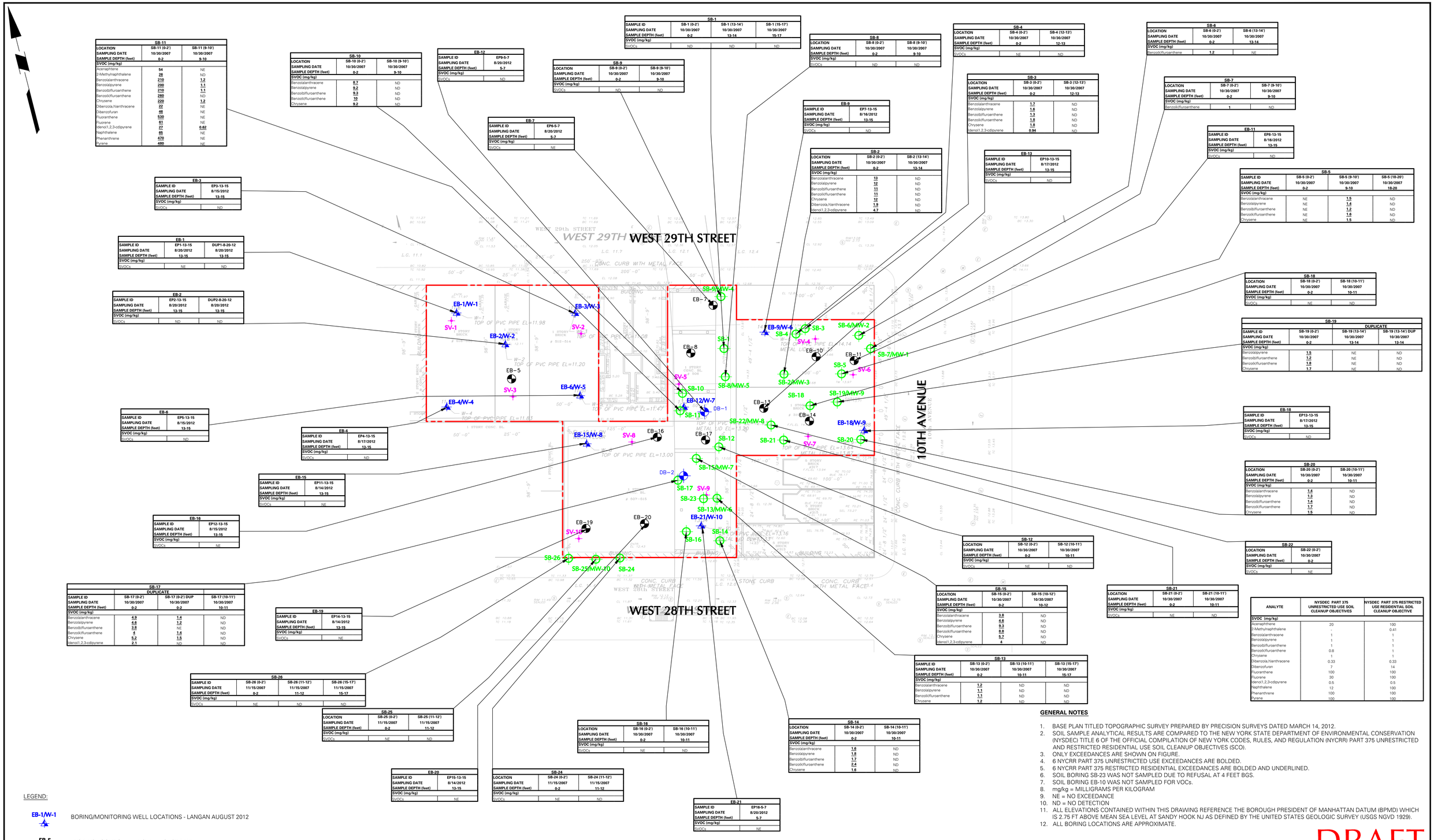
Langan International LLC
Collectively known as Langan

Project
HIGHLINE 28-29 DEVELOPMENT
NEW YORK NEW YORK

Drawing Title
GRAB SOIL SAMPLE LOCATION AND VOC RESULTS PLAN

Project No. 170190002	Drawing No. 10
Date 9/18/2012	
Scale 1" = 30'	
Drn. By JPA	
Last Revised	10 Of 15

Filename: \\langan.com\data\NY\data01\170190002\Cadd Data – 170190002\SIR\Figure 10 – VOC Soil Detections.dwg Date: 1/4/2013 Time: 09:15 User: jgood Style Table: Langan.stb Layout: D Size Sheet (Bottom)



SB-11		
LOCATION	SB-11 (0-2')	SB-11 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
SVOC (mg/kg)		
Acenaphthene	54	NE
2-Methylnaphthalene	26	ND
Benzo(a)anthracene	210	1.2
Benzo(a)pyrene	200	1.1
Benzo(b)fluoranthene	210	1.1
Benzo(k)fluoranthene	260	ND
Chrysene	220	1.2
Dibenzo(a,h)anthracene	22	NE
Dibenzofuran	46	NE
Fluoranthene	530	NE
Fluorene	61	NE
Ideno(1,2,3-cd)pyrene	27	0.62
Naphthalene	65	NE
Phenanthrene	470	NE
Pyrene	480	NE

SB-10		
LOCATION	SB-10 (0-2')	SB-10 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
SVOC (mg/kg)		
Benzo(a)anthracene	8.7	ND
Benzo(a)pyrene	9.2	ND
Benzo(b)fluoranthene	9.3	ND
Benzo(k)fluoranthene	10	ND
Chrysene	9.2	ND

EB-12	
SAMPLE ID	EP9-5-7
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	5-7
SVOC (mg/kg)	
SVOCs	ND

SB-9		
LOCATION	SB-9 (0-2')	SB-9 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
SVOC (mg/kg)		
SVOCs	ND	ND

EB-7	
SAMPLE ID	EP6-5-7
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	5-7
SVOC (mg/kg)	
SVOCs	NE

SB-1			
SAMPLE ID	SB-1 (0-2')	SB-1 (13-14')	SB-1 (15-17')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14	15-17
SVOC (mg/kg)			
SVOCs	ND	ND	ND

SB-8		
LOCATION	SB-8 (0-2')	SB-8 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
SVOC (mg/kg)		
SVOCs	ND	ND

SB-4		
LOCATION	SB-4 (0-2')	SB-4 (12-13')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	12-13
SVOC (mg/kg)		
SVOCs	NE	ND

SB-6		
LOCATION	SB-6 (0-2')	SB-6 (13-14')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14
SVOC (mg/kg)		
Benzo(b)fluoranthene	1.2	NE

SB-3		
LOCATION	SB-3 (0-2')	SB-3 (12-13')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	12-13
SVOC (mg/kg)		
Benzo(a)anthracene	1.7	ND
Benzo(a)pyrene	1.6	ND
Benzo(b)fluoranthene	1.3	ND
Benzo(k)fluoranthene	1.8	ND
Chrysene	1.8	ND
Ideno(1,2,3-cd)pyrene	0.94	ND

SB-7		
LOCATION	SB-7 (0-2')	SB-7 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
SVOC (mg/kg)		
Benzo(b)fluoranthene	1	ND

EB-11	
SAMPLE ID	EP8-13-15
SAMPLING DATE	8/16/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	ND

EB-3	
SAMPLE ID	EP3-13-15
SAMPLING DATE	8/15/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	ND

EB-1		
SAMPLE ID	EP1-13-15	DUP1-8-20-12
SAMPLING DATE	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	13-15	13-15
SVOC (mg/kg)		
SVOCs	NE	ND

SB-2		
LOCATION	SB-2 (0-2')	SB-2 (13-14')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14
SVOC (mg/kg)		
Benzo(a)anthracene	13	ND
Benzo(a)pyrene	12	ND
Benzo(b)fluoranthene	11	ND
Benzo(k)fluoranthene	11	ND
Chrysene	12	ND
Dibenzo(a,h)anthracene	1.9	ND
Ideno(1,2,3-cd)pyrene	4.7	ND

EB-13	
SAMPLE ID	EP10-13-15
SAMPLING DATE	8/17/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	ND

SB-5			
SAMPLE ID	SB-5 (0-2')	SB-5 (9-10')	SB-5 (18-20')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10	18-20
SVOC (mg/kg)			
Benzo(a)anthracene	NE	1.5	ND
Benzo(a)pyrene	NE	1.4	ND
Benzo(b)fluoranthene	NE	1.2	ND
Benzo(k)fluoranthene	NE	1.6	ND
Chrysene	NE	1.5	ND

SB-18		
LOCATION	SB-18 (0-2')	SB-18 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
SVOC (mg/kg)		
SVOCs	NE	ND

SB-19			
	DUPLICATE		
SAMPLE ID	SB-19 (0-2')	SB-19 (13-14')	SB-19 (13-14') DUP
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14	13-14
SVOC (mg/kg)			
Benzo(a)pyrene	1.5	NE	ND
Benzo(b)fluoranthene	1.2	NE	ND
Benzo(k)fluoranthene	1.8	NE	ND
Chrysene	1.7	NE	ND

EB-6	
SAMPLE ID	EP5-13-15
SAMPLING DATE	8/15/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	ND

EB-4	
SAMPLE ID	EP4-13-15
SAMPLING DATE	8/17/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	ND

EB-18	
SAMPLE ID	EP13-13-15
SAMPLING DATE	8/17/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	ND

EB-15	
SAMPLE ID	EP11-13-15
SAMPLING DATE	8/14/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	NE

SB-20		
LOCATION	SB-20 (0-2')	SB-20 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
SVOC (mg/kg)		
Benzo(a)anthracene	1.4	ND
Benzo(a)pyrene	1.3	ND
Benzo(b)fluoranthene	1.4	ND
Benzo(k)fluoranthene	1.7	ND
Chrysene	1.5	ND

EB-16	
SAMPLE ID	EP12-13-15
SAMPLING DATE	8/15/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	NE

SB-12		
LOCATION	SB-12 (0-2')	SB-12 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
SVOC (mg/kg)		
SVOCs	NE	ND

SB-22	
LOCATION	SB-22 (0-2')
SAMPLING DATE	10/30/2007
SAMPLE DEPTH (feet)	0-2
SVOC (mg/kg)	
SVOCs	NE

SB-17			
	DUPLICATE		
SAMPLE ID	SB-17 (0-2')	SB-17 (0-2') DUP	SB-17 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	0-2	10-11
SVOC (mg/kg)			
Benzo(a)anthracene	4.9	1.4	ND
Benzo(a)pyrene	4.6	1.2	ND
Benzo(b)fluoranthene	3.8	NE	ND
Benzo(k)fluoranthene	4	1.4	ND
Chrysene	5.2	1.5	ND
Ideno(1,2,3-cd)pyrene	2.1	ND	ND

EB-19	
SAMPLE ID	EP14-13-15
SAMPLING DATE	8/14/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	NE

SB-15		
LOCATION	SB-15 (0-2')	SB-15 (10-12')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-12
SVOC (mg/kg)		
Benzo(a)anthracene	3.8	ND
Benzo(a)pyrene	4.6	ND
Benzo(b)fluoranthene	9.3	ND
Benzo(k)fluoranthene	8.8	ND
Chrysene	5.7	ND
Ideno(1,2,3-cd)pyrene	4	ND

SB-21		
LOCATION	SB-21 (0-2')	SB-21 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
SVOC (mg/kg)		
SVOCs	NE	ND

ANALYTE	NYSDEC PART 375 UNRESTRICTED USE SOIL CLEANUP OBJECTIVES	NYSDEC PART 375 RESTRICTED USE RESIDENTIAL SOIL CLEANUP OBJECTIVE
SVOC (mg/kg)		
Acenaphthene	20	100
2-Methylnaphthalene	-	0.41
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	0.8	1
Chrysene	1	1
Dibenzo(a,h)anthracene	0.33	0.33
Dibenzofuran	7	14
Fluoranthene	100	100
Fluorene	30	100
Ideno(1,2,3-cd)pyrene	0.5	0.5
Naphthalene	12	100
Phenanthrene	100	100
Pyrene	100	100

SB-26			
SAMPLE ID	SB-26 (0-2')	SB-26 (11-12')	SB-26 (15-17')
SAMPLING DATE	11/15/2007	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12	15-17
SVOC (mg/kg)			
SVOCs	NE	ND	ND

SB-13			
SAMPLE ID	SB-13 (0-2')	SB-13 (10-11')	SB-13 (15-17')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11	15-17
SVOC (mg/kg)			
Benzo(a)anthracene	1.2	ND	ND
Benzo(a)pyrene	1.1	ND	ND
Benzo(b)fluoranthene	1.1	ND	ND
Chrysene	1.2	ND	ND

SB-25		
LOCATION	SB-25 (0-2')	SB-25 (11-12')
SAMPLING DATE	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12
SVOC (mg/kg)		
SVOCs	NE	ND

SB-16		
LOCATION	SB-16 (0-2')	SB-16 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
SVOC (mg/kg)		
SVOCs	NE	ND

SB-14		
LOCATION	SB-14 (0-2')	SB-14 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
SVOC (mg/kg)		
Benzo(a)anthracene	1.6	ND
Benzo(a)pyrene	1.8	ND
Benzo(b)fluoranthene	1.7	ND
Benzo(k)fluoranthene	2.4	ND
Chrysene	1.6	ND

EB-20	
SAMPLE ID	EP15-13-15
SAMPLING DATE	8/14/2012
SAMPLE DEPTH (feet)	13-15
SVOC (mg/kg)	
SVOCs	NE

SB-24		
LOCATION	SB-24 (0-2')	SB-24 (11-12')
SAMPLING DATE	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12
SVOC (mg/kg)		
SVOCs	NE	ND

EB-21	
SAMPLE ID	EP16-5-7
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	5-7
SVOC (mg/kg)	
SVOCs	NE

LEGEND:

- EB-1/W-1 — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012
- EB-5 — BORING LOCATION - LANGAN AUGUST 2012
- SV-1 — SOIL VAPOR LOCATION - LANGAN AUGUST 2012
- SB-9/MW-4 — BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007
- DEVELOPMENT FOOTPRINT

GENERAL NOTES

1. BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TITLE 6 OF THE OFFICIAL COMPILATION OF NEW YORK CODES, RULES, AND REGULATION (NYCRR) PART 375 UNRESTRICTED AND RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (SCO).
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4. 6 NYCRR PART 375 UNRESTRICTED USE EXCEEDANCES ARE BOLDED.
5. 6 NYCRR PART 375 RESTRICTED RESIDENTIAL EXCEEDANCES ARE BOLDED AND UNDERLINED.
6. SOIL BORING SB-23 WAS NOT SAMPLED DUE TO REFUSAL AT 4 FEET BGS.
7. SOIL BORING EB-10 WAS NOT SAMPLED FOR VOCs.
8. mg/kg = MILLIGRAMS PER KILOGRAM
9. NE = NO EXCEEDANCE
10. ND = NO DETECTION
11. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).
12. ALL BORING LOCATIONS ARE APPROXIMATE.

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Date	Description	No.
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PROFESSIONAL XXXXXXXXXXXXX N.J. LIC. No.XXXXX DATE

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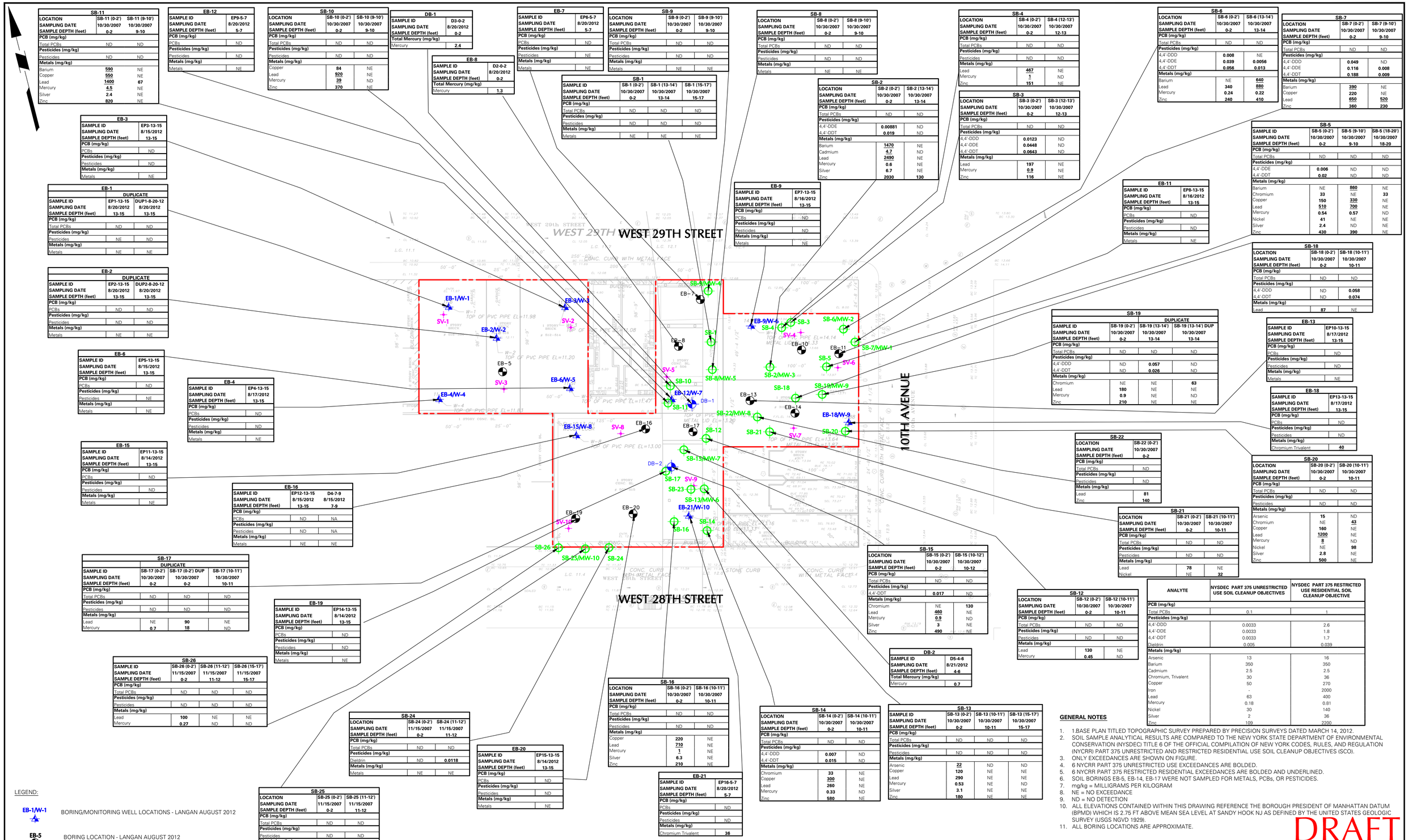
Collectively known as Langan

Project
HIGHLINE 28-29 DEVELOPMENT
NEW YORK NEW YORK

Drawing Title
GRAB SOIL SAMPLE LOCATION AND SVOC RESULTS PLAN

Project No. 170190002	Drawing No.
Date 9/18/2012	11
Scale 1" = 30'	
Drn. By JPA	
Last Revised	11 Of 15

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data - 170190002\SIR\Figure 11 - SVOC Soil Detections.dwg Date: 1/4/2013 Time: 09:13 User: jgood Style Table: Langan.stb Layout: D Size Sheet (Bottom)



SB-11		
LOCATION	SB-11 (0-2')	SB-11 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Barium	**590**	NE
Copper	**550**	NE
Lead	**1400**	**67**
Mercury	**4.5**	NE
Silver	**2.4**	NE
Zinc	**820**	NE

EB-12	
SAMPLE ID	EP9-5-7
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	5-7
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

SB-10		
LOCATION	SB-10 (0-2')	SB-10 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Copper	**84**	NE
Lead	**920**	NE
Mercury	**39**	ND
Zinc	**370**	NE

DB-1	
SAMPLE ID	D3-0-2
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	0-2
Total Mercury (mg/kg)	
Mercury	**2.4**

EB-7	
SAMPLE ID	EP6-5-7
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	5-7
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	NE
Metals (mg/kg)	
Metals	NE

SB-9		
LOCATION	SB-9 (0-2')	SB-9 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Metals	NE	NE

EB-8	
SAMPLE ID	D2-0-2
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	0-2
Total Mercury (mg/kg)	
Mercury	**1.3**

SB-1			
SAMPLE ID	SB-1 (0-2')	SB-1 (13-14')	SB-1 (15-17')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14	15-17
PCB (mg/kg)			
Total PCBs	ND	ND	ND
Pesticides (mg/kg)			
Pesticides	ND	ND	ND
Metals (mg/kg)			
Metals	NE	NE	NE

SB-8		
LOCATION	SB-8 (0-2')	SB-8 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Metals	NE	NE

SB-4		
LOCATION	SB-4 (0-2')	SB-4 (12-13')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	12-13
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Lead	**467**	NE
Mercury	**1**	ND
Zinc	**151**	NE

SB-6		
LOCATION	SB-6 (0-2')	SB-6 (13-14')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
4,4'-DDD	**0.008**	NE
4,4'-DDE	**0.039**	**0.0056**
4,4'-DDT	**0.056**	**0.013**
Metals (mg/kg)		
Barium	NE	**640**
Lead	**340**	**880**
Mercury	**0.24**	**0.22**
Zinc	**240**	**410**

SB-7		
LOCATION	SB-7 (0-2')	SB-7 (9-10')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
4,4'-DDD	**0.049**	ND
4,4'-DDE	**0.116**	**0.008**
4,4'-DDT	**0.188**	**0.009**
Metals (mg/kg)		
Barium	**390**	NE
Copper	**220**	NE
Lead	**650**	**520**
Zinc	**360**	**230**

EB-3	
SAMPLE ID	EP3-13-15
SAMPLING DATE	8/15/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

EB-1	DUPLICATE	
SAMPLE ID	EP1-13-15	DUP1-8-20-12
SAMPLING DATE	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	13-15	13-15
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	NE	ND
Metals (mg/kg)		
Metals	NE	NE

EB-2	DUPLICATE	
SAMPLE ID	EP2-13-15	DUP2-8-20-12
SAMPLING DATE	8/20/2012	8/20/2012
SAMPLE DEPTH (feet)	13-15	13-15
PCB (mg/kg)		
PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Metals	NE	NE

EB-9	
SAMPLE ID	EP7-13-15
SAMPLING DATE	8/16/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

SB-2		
LOCATION	SB-2 (0-2')	SB-2 (13-14')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
4,4'-DDE	**0.00881**	ND
4,4'-DDT	**0.019**	ND
Metals (mg/kg)		
Barium	**1470**	NE
Cadmium	**4.7**	ND
Lead	**2490**	NE
Mercury	**0.6**	NE
Silver	**6.7**	NE
Zinc	**2030**	**130**

SB-3		
LOCATION	SB-3 (0-2')	SB-3 (12-13')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	12-13
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
4,4'-DDD	**0.0123**	ND
4,4'-DDE	**0.0448**	ND
4,4'-DDT	**0.0643**	ND
Metals (mg/kg)		
Lead	**197**	NE
Mercury	**0.9**	NE
Zinc	**116**	NE

SB-5			
SAMPLE ID	SB-5 (0-2')	SB-5 (9-10')	SB-5 (18-20')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	9-10	18-20
PCB (mg/kg)			
Total PCBs	ND	ND	ND
Pesticides (mg/kg)			
4,4'-DDE	**0.006**	ND	ND
4,4'-DDT	**0.02**	ND	ND
Metals (mg/kg)			
Barium	NE	**860**	NE
Chromium	**33**	NE	**33**
Copper	**150**	**330**	NE
Lead	**510**	**700**	NE
Mercury	**0.54**	**0.57**	ND
Nickel	**41**	NE	NE
Silver	**2.4**	ND	NE
Zinc	**430**	**390**	NE

EB-11	
SAMPLE ID	EP8-13-15
SAMPLING DATE	8/16/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

SB-18		
LOCATION	SB-18 (0-2')	SB-18 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
4,4'-DDD	ND	**0.058**
4,4'-DDT	ND	**0.074**
Metals (mg/kg)		
Lead	**87**	NE

SB-19	DUPLICATE		
SAMPLE ID	SB-19 (0-2')	SB-19 (13-14')	SB-19 (13-14') DUP
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	13-14	13-14
PCB (mg/kg)			
Total PCBs	ND	ND	ND
Pesticides (mg/kg)			
4,4'-DDD	ND	**0.057**	ND
4,4'-DDT	ND	**0.026**	ND
Metals (mg/kg)			
Chromium	NE	NE	**63**
Lead	**180**	NE	NE
Mercury	**0.9**	NE	ND
Zinc	**210**	NE	NE

EB-13	
SAMPLE ID	EP10-13-15
SAMPLING DATE	8/17/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

EB-18	
SAMPLE ID	EP13-13-15
SAMPLING DATE	8/17/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Chromium Trivalent	**40**

EB-6	
SAMPLE ID	EP5-13-15
SAMPLING DATE	8/15/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	NE
Metals (mg/kg)	
Metals	NE

EB-4	
SAMPLE ID	EP4-13-15
SAMPLING DATE	8/17/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

SB-22	
LOCATION	SB-22 (0-2')
SAMPLING DATE	10/30/2007
SAMPLE DEPTH (feet)	0-2
PCB (mg/kg)	
Total PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Lead	**81**
Zinc	**140**

SB-20		
LOCATION	SB-20 (0-2')	SB-20 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Arsenic	**15**	ND
Chromium	NE	**43**
Copper	**160**	NE
Lead	**1200**	NE
Mercury	**8**	ND
Nickel	NE	**98**
Silver	**2.8**	NE
Zinc	**500**	NE

SB-21		
LOCATION	SB-21 (0-2')	SB-21 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Lead	**78**	NE
Nickel	NE	**32**

EB-15	
SAMPLE ID	EP11-13-15
SAMPLING DATE	8/14/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

EB-16		
SAMPLE ID	EP12-13-15	D4-7-9
SAMPLING DATE	8/15/2012	8/15/2012
SAMPLE DEPTH (feet)	13-15	7-9
PCB (mg/kg)		
PCBs	ND	NA
Pesticides (mg/kg)		
Pesticides	ND	NA
Metals (mg/kg)		
Metals	NE	NE

SB-17	DUPLICATE		
SAMPLE ID	SB-17 (0-2')	SB-17 (0-2') DUP	SB-17 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	0-2	10-11
PCB (mg/kg)			
Total PCBs	ND	ND	ND
Pesticides (mg/kg)			
Pesticides	ND	ND	ND
Metals (mg/kg)			
Lead	NE	**90**	NE
Mercury	**0.7**	**18**	ND

EB-19	
SAMPLE ID	EP14-13-15
SAMPLING DATE	8/14/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

SB-26			
SAMPLE ID	SB-26 (0-2')	SB-26 (11-12')	SB-26 (15-17')
SAMPLING DATE	11/15/2007	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12	15-17
PCB (mg/kg)			
Total PCBs	ND	ND	ND
Pesticides (mg/kg)			
Pesticides	ND	ND	ND
Metals (mg/kg)			
Lead	**100**	NE	NE
Mercury	**0.27**	ND	ND

SB-24		
LOCATION	SB-24 (0-2')	SB-24 (11-12')
SAMPLING DATE	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Dieldrin	ND	**0.0118**
Metals (mg/kg)		
Metals	NE	NE

EB-20	
SAMPLE ID	EP15-13-15
SAMPLING DATE	8/14/2012
SAMPLE DEPTH (feet)	13-15
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Metals	NE

SB-25		
LOCATION	SB-25 (0-2')	SB-25 (11-12')
SAMPLING DATE	11/15/2007	11/15/2007
SAMPLE DEPTH (feet)	0-2	11-12
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Metals	NE	NE

SB-16		
LOCATION	SB-16 (0-2')	SB-16 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Copper	**220**	NE
Lead	**710**	NE
Mercury	**1**	NE
Silver	**6.3**	NE
Zinc	**210**	NE

EB-21	
SAMPLE ID	EP16-5-7
SAMPLING DATE	8/20/2012
SAMPLE DEPTH (feet)	5-7
PCB (mg/kg)	
PCBs	ND
Pesticides (mg/kg)	
Pesticides	ND
Metals (mg/kg)	
Chromium Trivalent	**36**

SB-14		
LOCATION	SB-14 (0-2')	SB-14 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
4,4'-DDD	**0.007**	ND
4,4'-DDT	**0.015**	ND
Metals (mg/kg)		
Chromium	**33**	NE
Copper	**300**	NE
Lead	**260**	NE
Mercury	**0.33**	ND
Zinc	**580**	NE

SB-13			
SAMPLE ID	SB-13 (0-2')	SB-13 (10-11')	SB-13 (15-17')
SAMPLING DATE	10/30/2007	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11	15-17
PCB (mg/kg)			
Total PCBs	ND	ND	ND
Pesticides (mg/kg)			
Pesticides	ND	ND	ND
Metals (mg/kg)			
Arsenic	**22**	ND	ND
Copper	**120**	NE	NE
Lead	**290**	NE	NE
Mercury	**0.53**	NE	ND
Silver	**3.1**	NE	NE
Zinc	**180**	NE	NE

SB-15		
LOCATION	SB-15 (0-2')	SB-15 (10-12')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-12
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
4,4'-DDT	**0.017**	ND
Metals (mg/kg)		
Chromium	NE	**130**
Lead	**460**	NE
Mercury	**0.9**	ND
Silver	**3**	NE
Zinc	**490**	NE

DB-2	
SAMPLE ID	D5-4-6
SAMPLING DATE	8/21/2012
SAMPLE DEPTH (feet)	4-6
Total Mercury (mg/kg)	
Mercury	**0.7**

SB-12		
LOCATION	SB-12 (0-2')	SB-12 (10-11')
SAMPLING DATE	10/30/2007	10/30/2007
SAMPLE DEPTH (feet)	0-2	10-11
PCB (mg/kg)		
Total PCBs	ND	ND
Pesticides (mg/kg)		
Pesticides	ND	ND
Metals (mg/kg)		
Lead	**130**	NE
Mercury	**0.45**	ND

ANALYTE	NYSDEC PART 375 UNRESTRICTED USE SOIL CLEANUP OBJECTIVES	NYSDEC PART 375 RESTRICTED USE RESIDENTIAL SOIL CLEANUP OBJECTIVE
PCB (mg/kg)		
Total PCBs	0.1	1
Pesticides (mg/kg)		
4,4'-DDD	0.0033	2.6
4,4'-DDE	0.0033	1.8
4,4'-DDT	0.0033	1.7
Dieldrin	0.005	0.039
Metals (mg/kg)		
Arsenic	13	16
Barium	350	350
Cadmium	2.5	2.5
Chromium, Trivalent	30	36
Copper	50	270
Iron	-	2000
Lead	63	400
Mercury	0.18	0.81
Nickel	30	140
Silver	2	36
Zinc	109	2200

GENERAL NOTES

1. 1.BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TITLE 6 OF THE OFFICIAL COMPILATION OF NEW YORK CODES, RULES, AND REGULATION (NYCRR) PART 375 UNRESTRICTED AND RESTRICTED RESIDENTIAL USE SOIL CLEANUP OBJECTIVES (SCO).
3. ONLY EXCEEDANCES ARE SHOWN ON FIGURE.
4. 6 NYCRR PART 375 UNRESTRICTED USE EXCEEDANCES ARE BOLDED.
5. 6 NYCRR PART 375 RESTRICTED RESIDENTIAL EXCEEDANCES ARE BOLDED AND UNDERLINED.
6. SOIL BORINGS EB-5, EB-14, EB-17 WERE NOT SAMPLED FOR METALS, PCBs, OR PESTICIDES.
7. mg/kg = MILLIGRAMS PER KILOGRAM
8. NE = NO EXCEEDANCE
9. ND = NO DETECTION
10. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).
11. ALL BORING LOCATIONS ARE APPROXIMATE.

DRAFT

LEGEND:

- EB-1/W-1 — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012
- EB-5 — BORING LOCATION - LANGAN AUGUST 2012
- SV-1 — SOIL VAPOR LOCATION - LANGAN AUGUST 2012
- SB-9/MW-4 — BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007
- DEVELOPMENT FOOTPRINT

30 0 15 30
SCALE IN FEET

Date	Description	No.
	Revisions	

NAME DATE
PROFESSIONAL XXXXXXXXXXXXX N.J. LIC. No.XXXXX

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Collectively known as Langan

Project: HIGHLINE 28-29 DEVELOPMENT
NEW YORK NEW YORK

Drawing Title: GRAB SOIL SAMPLE LOCATION AND METALS, PESTICIDES, AND PCB RESULTS PLAN

Project No. 170190002	Drawing No. 12
Date 9/18/2012	
Scale 1" = 30'	
Drn. By JPA	
Last Revised	12 Of 15

Filename: \\langan.com\data\NY\data01\170190002\Cadd Data - 170190002\SIR\Figure 12 - Metals Soil Detections.dwg Date: 1/4/2013 Time: 09:17 User: jgood Style Table: Langan.stb Layout: D Size Sheet (Bottom)

W-3	
SAMPLE ID	L1215574-03
SAMPLING DATE	8/30/2012
VOC (ug/l)	
VOCs	NE
Total CVOCs	0.71
SVOC (ug/l)	
Benzo(a)pyrene	0.09 J
Benzo(b)fluoranthene	0.18 J
Benzo(k)fluoranthene	0.14 J
Chrysene	0.16 J
Indeno(1,2,3-cd)Pyrene	0.16 J

W-7		
SAMPLE ID	L1215574-04	
SAMPLING DATE	8/30/2012	
VOC (ug/l)		
1,1-Dichloroethane	62	J,D50
Tetrachloroethene	41	D50
Vinyl chloride	1,000	D50
Trichloroethene	21	J,D50
cis-1,2-Dichloroethene	2,900	D50
Total CVOCs	4,024	
SVOC (ug/l)		
SVOCs	ND	

MW-4	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
Acetone	NE
cis-1,2-Dichloroethene	19
Total CVOCs	19
SVOC (ug/l)	
SVOCs	ND

MW-5	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
1,1-Dichloroethane	69
1,1-Dichloroethylene	5.9
cis-1,2-Dichloroethene	360
Tetrachloroethene	6.7
trans-1,2-Dichloroethene	6.1
Trichloroethene	11
Vinyl chloride	18
Total CVOCs	476.7
SVOC (ug/l)	
SVOCs	ND

W-6		
SAMPLE ID	L1215721-01	
SAMPLING DATE	9/1/2012	
VOC (ug/l)		
cis-1,2-Dichloroethene	12	
Total CVOCs	16.82	
SVOC (ug/l)		
Chrysene	0.05	J

MW-3	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
cis-1,2-Dichloroethene	110
Tetrachloroethene	18
Trichloroethene	21
Total CVOCs	149
SVOC (ug/l)	
SVOCs	ND

MW-2	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
cis-1,2-Dichloroethene	70
Tetrachloroethene	15
Trichloroethene	17
Total CVOCs	102
SVOC (ug/l)	
bis(2-Ethylhexyl)phthalate	16

MW-1		DUP(MW-1)
SAMPLING DATE	11/15/2007	11/15/2007
VOC (ug/l)		
cis-1,2-Dichloroethene	8.7	150
Tetrachloroethene	ND	19
Trichloroethene	ND	25
Total CVOCs	8.7	194
SVOC (ug/l)		
SVOCs	ND	ND

W-1		
SAMPLE ID	L1215574-01	
SAMPLING DATE	8/30/2012	
VOC (ug/l)		
1,1-Dichloroethane	100	D2
Vinyl chloride	34	D2
Chloroethane	7.2	D2
cis-1,2-Dichloroethene	21	D2
Total CVOCs	162.2	
SVOC (ug/l)		
Benzo(a)pyrene	0.1	J
Benzo(b)fluoranthene	0.1	J
Benzo(k)fluoranthene	0.1	J
Chrysene	0.13	J
Indeno(1,2,3-cd)Pyrene	0.13	J

W-2		
SAMPLE ID	L1215574-02	
SAMPLING DATE	8/30/2012	
VOC (ug/l)		
1,1-Dichloroethane	390	D100
Vinyl chloride	500	D100
1,1-Dichloroethene	69	D100
cis-1,2-Dichloroethene	5,200	D100
Naphthalene	110	J,D100
Total CVOCs	6159	
SVOC (ug/l)		
SVOCs	ND	

W-4				
	DUPLICATE			
SAMPLE ID	L1215470-01		L1215470-04 DUP-1	
SAMPLING DATE	8/29/2012		8/29/2012	
VOC (ug/l)				
1,1-Dichloroethane	33	D5	33	D5
Vinyl chloride	180	D5	170	D5
Chloroethane	14	D5	13	D5
Trichloroethene	6.4	D5	5.7	D5
cis-1,2-Dichloroethene	220	D5	210	D5
Naphthalene	NE		14	D5
Total CVOCs	455.6		433.9	
SVOC (ug/l)				
Naphthalene	10		14	
Benzo(a)pyrene	0.09	J	0.11	J
Benzo(b)fluoranthene	0.09	J	0.13	J
Benzo(k)fluoranthene	0.09	J	0.09	J
Chrysene	0.14	J	0.16	J
Indeno(1,2,3-cd)Pyrene	0.08	J	0.1	J

W-5		
SAMPLE ID	L1215470-02	
SAMPLING DATE	8/29/2012	
VOC (ug/l)		
1,1-Dichloroethane	77	D2.5
Toluene	5.3	J,D2.5
Ethylbenzene	240	D2.5
Vinyl chloride	1,200	D25
Chloroethane	9.3	D2.5
trans-1,2-Dichloroethene	6.2	D2.5
p/m-Xylene	490	D25
o-Xylene	120	D2.5
cis-1,2-Dichloroethene	210	D2.5
1,2,4-Trimethylbenzene	19	D2.5
Total CVOCs	1,503	
SVOC (ug/l)		
Benzo(a)pyrene	0.32	
Benzo(b)fluoranthene	0.47	
Benzo(k)fluoranthene	0.34	
Chrysene	0.54	
Indeno(1,2,3-cd)Pyrene	0.38	

W-8		
SAMPLE ID	L1215470-03	
SAMPLING DATE	8/29/2012	
VOC (ug/l)		
1,1-Dichloroethane	36	J,D40
1,1,1-Trichloroethane	93	J,D40
Ethylbenzene	59	J,D40
Vinyl chloride	160	D40
1,1-Dichloroethene	24	D40
p/m-Xylene	64	J,D40
o-Xylene	51	J,D40
cis-1,2-Dichloroethene	1,700	D40
Total CVOCs	2,013	
SVOC (ug/l)		
Phenol	3.6	J
Benzo(a)pyrene	0.16	J
Benzo(b)fluoranthene	0.16	J
Benzo(k)fluoranthene	0.17	J
Chrysene	0.23	
Indeno(1,2,3-cd)Pyrene	0.15	J

MW-10	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
1,1-Dichloroethane	51
cis-1,2-Dichloroethene	75
Methyl-Tert-Butyl-Ether	34
Vinyl chloride	23
Total CVOCs	149
SVOC (ug/l)	
SVOCs	ND

W-10	
SAMPLE ID	L1215721-03
SAMPLING DATE	8/31/2012
VOC (ug/l)	
Tetrachloroethene	50
1,1,1-Trichloroethane	31
Toluene	6.3
Vinyl chloride	9.3
Trichloroethene	13
cis-1,2-Dichloroethene	39
Total CVOCs	147.71
SVOC (ug/l)	
SVOCs	NE

MW-6	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
1,1,1-Trichloroethane	14
1,1-Dichloroethene	190
cis-1,2-Dichloroethene	47
Ethylbenzene	9
O-Xylene	6
Tetrachloroethene	59
Trichloroethene	7.3
Vinyl chloride	5.2
Total CVOCs	322.5
SVOC (ug/l)	
SVOCs	ND

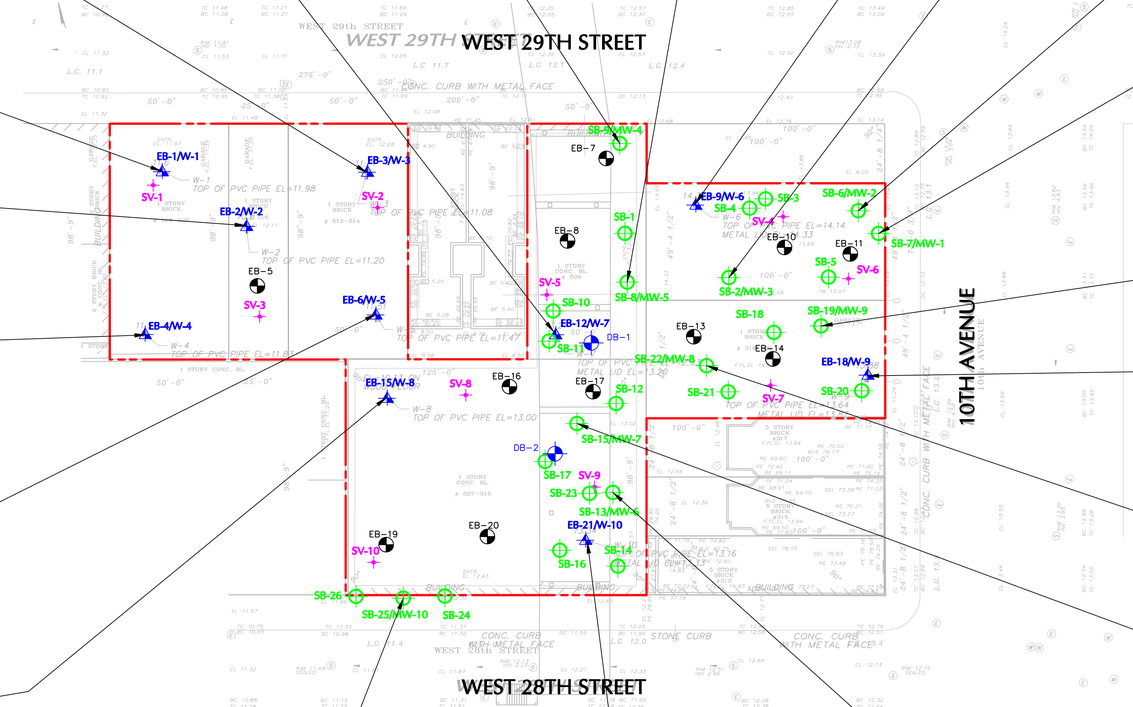
MW-9	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
cis-1,2-Dichloroethene	110
Total CVOCs	110
SVOC (ug/l)	
SVOCs	NE

W-9	
SAMPLE ID	L1215721-02
SAMPLING DATE	8/31/2012
VOC (ug/l)	
Benzene	2.5
cis-1,2-Dichloroethene	30
Total CVOCs	32.7
SVOC (ug/l)	
SVOCs	NE

MW-8	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
VOCs	Dry Well
SVOC (ug/l)	
SVOCs	Dry Well

MW-7	
SAMPLING DATE	11/15/2007
VOC (ug/l)	
1,1,1-Trichloroethane	23
1,1-Dichloroethane	77
1,1-Dichloroethene	16
cis-1,2-Dichloroethene	460
Tetrachloroethene	300
trans-1,2-Dichloroethene	6.4
Trichloroethene	77
Vinyl chloride	33
Total CVOCs	992.4
SVOC (ug/l)	
SVOCs	ND

ANALYTE	NYSDEC TOGS 1.1.1 AWQS
VOC (ug/l)	
1,1-Dichloroethane	5
1,1-Dichloroethene	5
1,1-Dichloroethene	5
1,1-Dichloroethylene	5
1,1,1-Trichloroethane	5
1,2,4-Trimethylbenzene	5
Acetone	50
Tetrachloroethene	5
Benzene	1
Toluene	5
Ethylbenzene	5
Vinyl chloride	2
Chloroethane	5
trans-1,2-Dichloroethene	5
Trichloroethene	5
p/m-Xylene	5
o-Xylene	5
cis-1,2-Dichloroethene	5
Methyl-Tert-Butyl-Ether	10
Naphthalene	10
SVOC (ug/l)	
Phenol	1
Naphthalene	10
bis(2-Ethylhexyl)phthalate	5
Benzo(a)pyrene	0
Benzo(b)fluoranthene	0.002
Benzo(k)fluoranthene	0.002
Chrysene	0.002
Indeno(1,2,3-cd)Pyrene	0.002



LEGEND:

- EB-1/W-1 — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012
- EB-5 — BORING LOCATION - LANGAN AUGUST 2012
- SV-1 — SOIL VAPOR LOCATION - LANGAN AUGUST 2012
- SB-9/MW-4 — BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007
- DEVELOPMENT FOOTPRINT

30 0 15 30
SCALE IN FEET

GENERAL NOTES

1. BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. 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 (AWQS).
3. ONLY EXCEEDANCES ARE SHOWN ON FIGURE.
4. VOC = VOLATILE ORGANIC COMPOUNDS
5. ug/l = MICROGRAMS PER LITER
6. NE = NO EXCEEDANCE
7. ND = NO DETECTION
8. J = ANALYTE WAS DETECTED ABOVE THE METHOD DETECTION LIMIT BUT BELOW THE REPORTING LIMIT. THE RESULT IS AN ESTIMATED CONCENTRATION.
9. D= DILUTION FACTOR
10. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929).
11. ALL WELL LOCATIONS ARE APPROXIMATE.

DRAFT

Date	Description	No.
Revisions		

NAME
PROFESSIONAL XXXXXXXXXXXX N.J. LIC. No.XXXXX DATE

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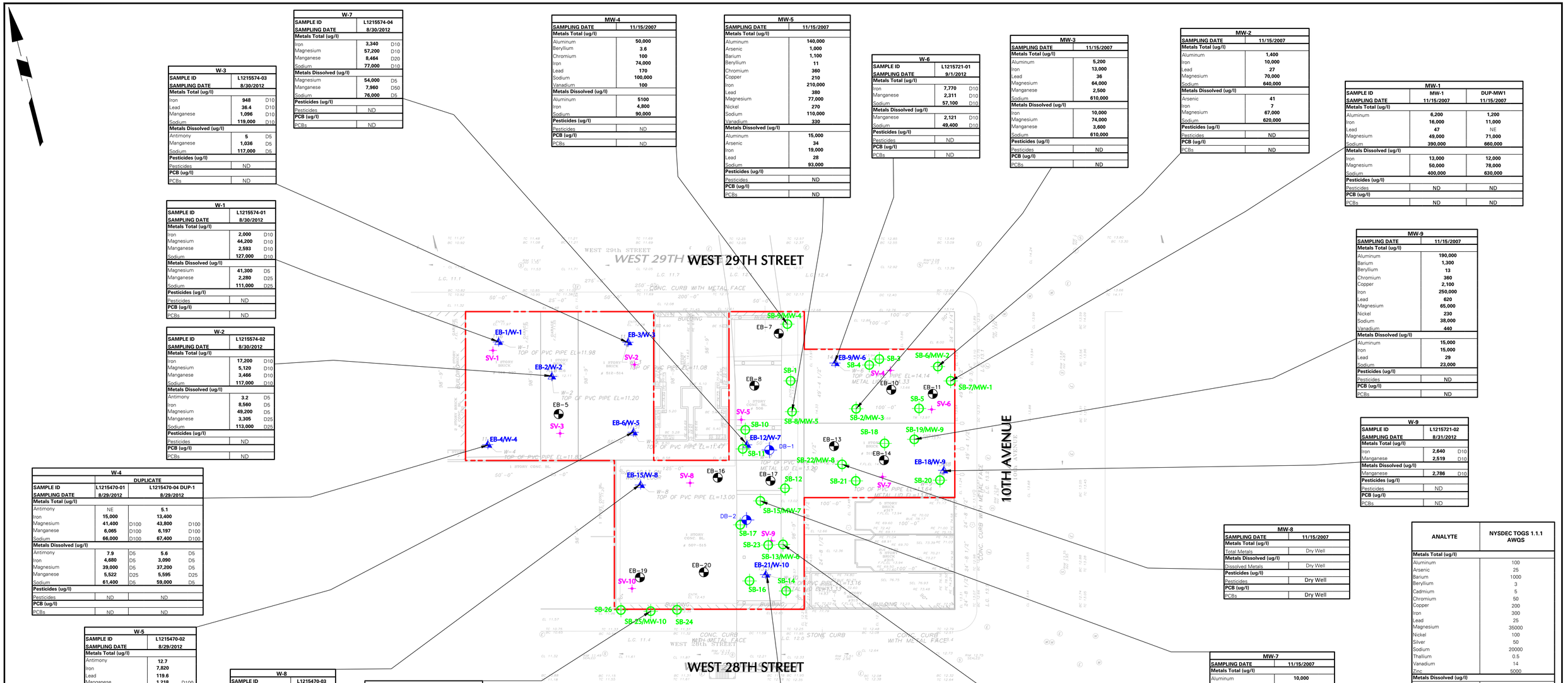
Langan International LLC
Collectively known as Langan

Project
HIGHLINE 28-29 DEVELOPMENT
NEW YORK NEW YORK

Drawing Title
GROUNDWATER SAMPLE LOCATION AND VOC AND SVOC RESULTS PLAN

Project No. 170190002	Drawing No.
Date 9/18/2012	13
Scale 1" = 30'	
Drn. By JPA	
Last Revised	13 Of 15

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data – 170190002\SIR\Figure 13 – VOC and SVOC Groundwater Detections.dwg Date: 1/4/2013 Time: 09:22 User: jgood Style Table: Langan.stb Layout: D Size Sheet (Bottom)



W-7	
SAMPLE ID	**L1215574-04**
SAMPLING DATE	**8/30/2012**
Metals Total (ug/l)	
Iron	**3,340** D10
Magnesium	**57,200** D10
Manganese	**8,464** D20
Sodium	**77,000** D10
Metals Dissolved (ug/l)	
Magnesium	**54,000** D5
Manganese	**7,960** D50
Sodium	**76,000** D5
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

W-3	
SAMPLE ID	**L1215574-03**
SAMPLING DATE	**8/30/2012**
Metals Total (ug/l)	
Iron	**948** D10
Lead	**36.4** D10
Manganese	**1,096** D10
Sodium	**119,000** D10
Metals Dissolved (ug/l)	
Antimony	**5** D5
Manganese	**1,036** D5
Sodium	**117,000** D5
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

W-1	
SAMPLE ID	**L1215574-01**
SAMPLING DATE	**8/30/2012**
Metals Total (ug/l)	
Iron	**2,000** D10
Magnesium	**44,200** D10
Manganese	**2,593** D10
Sodium	**127,000** D10
Metals Dissolved (ug/l)	
Magnesium	**41,300** D5
Manganese	**2,280** D25
Sodium	**111,000** D25
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

W-2	
SAMPLE ID	**L1215574-02**
SAMPLING DATE	**8/30/2012**
Metals Total (ug/l)	
Iron	**17,200** D10
Magnesium	**5,120** D10
Manganese	**3,466** D10
Sodium	**117,000** D10
Metals Dissolved (ug/l)	
Antimony	**3.2** D5
Iron	**8,560** D5
Magnesium	**49,200** D5
Manganese	**3,305** D25
Sodium	**113,000** D25
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

W-4		
		DUPLICATE
SAMPLE ID	**L1215470-01**	**L1215470-04 DUP-1**
SAMPLING DATE	**8/29/2012**	**8/29/2012**
Metals Total (ug/l)		
Antimony	NE	**5.1**
Iron	**15,000**	**13,400**
Magnesium	**41,400** D100	**43,800** D100
Manganese	**6,065** D100	**6,197** D100
Sodium	**66,000** D100	**67,400** D100
Metals Dissolved (ug/l)		
Antimony	**7.9** D5	**5.6** D5
Iron	**4,680** D5	**3,090** D5
Magnesium	**39,000** D5	**37,200** D5
Manganese	**5,522** D25	**5,595** D25
Sodium	**61,400** D5	**59,000** D5
Pesticides (ug/l)		
Pesticides	ND	ND
PCB (ug/l)		
PCBs	ND	ND

W-5	
SAMPLE ID	**L1215470-02**
SAMPLING DATE	**8/29/2012**
Metals Total (ug/l)	
Antimony	**12.7**
Iron	**7,820**
Lead	**119.6**
Manganese	**1,218** D100
Sodium	**33,200** D100
Metals Dissolved (ug/l)	
Antimony	**4.4** D5
Iron	**1,380** D5
Manganese	**1,107** D5
Sodium	**30,300** D5
Pesticides (ug/l)	
Pesticides	NE
PCB (ug/l)	
PCBs	ND

W-8	
SAMPLE ID	**L1215470-03**
SAMPLING DATE	**8/29/2012**
Metals Total (ug/l)	
Antimony	**27.7**
Arsenic	**31.1**
Sodium	**46,600** D10
Metals Dissolved (ug/l)	
Antimony	**22.4** D5
Arsenic	**29.2** D5
Sodium	**42,500** D5
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-10	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**270,000**
Barium	**2,100**
Beryllium	**24**
Cadmium	**5.5**
Chromium	**1,000**
Copper	**600**
Iron	**440,000**
Lead	**450**
Magnesium	**100,000**
Manganese	**13,000**
Nickel	**680**
Sodium	**220,000**
Vanadium	**900**
Metals Dissolved (ug/l)	
Aluminum	**170,000**
Arsenic	**90**
Barium	**1,500**
Beryllium	**15**
Chromium	**430**
Copper	**300**
Iron	**260,000**
Lead	**210**
Magnesium	**80,000**
Manganese	**9,000**
Nickel	**410**
Sodium	**200,000**
Vanadium	**440**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-4	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**50,000**
Beryllium	**3.6**
Chromium	**100**
Iron	**74,000**
Lead	**170**
Sodium	**100,000**
Vanadium	**100**
Metals Dissolved (ug/l)	
Aluminum	**5100**
Iron	**4,800**
Sodium	**90,000**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-5	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**140,000**
Arsenic	**1,000**
Barium	**1,100**
Beryllium	**11**
Chromium	**360**
Copper	**210**
Iron	**210,000**
Lead	**380**
Magnesium	**77,000**
Nickel	**270**
Sodium	**110,000**
Vanadium	**330**
Metals Dissolved (ug/l)	
Aluminum	**15,000**
Arsenic	**34**
Iron	**19,000**
Lead	**28**
Sodium	**93,000**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

W-6	
SAMPLE ID	**L1215721-01**
SAMPLING DATE	**9/1/2012**
Metals Total (ug/l)	
Iron	**7,770** D10
Manganese	**2,311** D10
Sodium	**57,100** D10
Metals Dissolved (ug/l)	
Manganese	**2,121** D10
Sodium	**49,400** D10
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-3	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**5,200**
Iron	**13,000**
Lead	**36**
Magnesium	**64,000**
Manganese	**2,500**
Sodium	**610,000**
Metals Dissolved (ug/l)	
Iron	**10,000**
Magnesium	**74,000**
Manganese	**3,600**
Sodium	**610,000**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-2	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**1,400**
Iron	**10,000**
Lead	**27**
Magnesium	**70,000**
Sodium	**640,000**
Metals Dissolved (ug/l)	
Arsenic	**41**
Iron	**7**
Magnesium	**67,000**
Sodium	**620,000**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-1		
SAMPLE ID	**MW-1**	**DUP-MW1**
SAMPLING DATE	**11/15/2007**	**11/15/2007**
Metals Total (ug/l)		
Aluminum	**6,200**	**1,200**
Iron	**16,000**	**11,000**
Lead	**47**	NE
Magnesium	**49,000**	**71,000**
Sodium	**390,000**	**660,000**
Metals Dissolved (ug/l)		
Iron	**13,000**	**12,000**
Magnesium	**50,000**	**78,000**
Sodium	**400,000**	**630,000**
Pesticides (ug/l)		
Pesticides	ND	ND
PCB (ug/l)		
PCBs	ND	ND

MW-9	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**190,000**
Barium	**1,300**
Beryllium	**13**
Chromium	**360**
Copper	**2,100**
Iron	**250,000**
Lead	**620**
Magnesium	**65,000**
Nickel	**230**
Sodium	**38,000**
Vanadium	**440**
Metals Dissolved (ug/l)	
Aluminum	**15,000**
Iron	**15,000**
Lead	**29**
Sodium	**23,000**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

W-9	
SAMPLE ID	**L1215721-02**
SAMPLING DATE	**8/31/2012**
Metals Total (ug/l)	
Iron	**2,640** D10
Manganese	**2,519** D10
Metals Dissolved (ug/l)	
Manganese	**2,786** D10
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

W-10	
SAMPLE ID	**L1215721-03**
SAMPLING DATE	**8/31/2012**
Metals Total (ug/l)	
Sodium	**21,600** D10
Metals Dissolved (ug/l)	
Sodium	**22,700** D10
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-8	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Total Metals	Dry Well
Metals Dissolved (ug/l)	
Dissolved Metals	Dry Well
Pesticides (ug/l)	
Pesticides	Dry Well
PCB (ug/l)	
PCBs	Dry Well

MW-7	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**10,000**
Iron	**17,000**
Lead	**55**
Magnesium	**41,000**
Sodium	**110,000**
Metals Dissolved (ug/l)	
Arsenic	**45**
Iron	**58,000**
Magnesium	**42,000**
Sodium	**100,000**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

MW-6	
SAMPLING DATE	**11/15/2007**
Metals Total (ug/l)	
Aluminum	**760,000**
Arsenic	**560**
Barium	**3,600**
Beryllium	**42**
Cadmium	**16**
Chromium	**1,800**
Copper	**2,500**
Iron	**1,200,000**
Lead	**3,500**
Magnesium	**160,000**
Nickel	**890**
Silver	**52**
Sodium	**58,000**
Thallium	**850**
Vanadium	**1,900**
Zinc	**4,600**
Metals Dissolved (ug/l)	
Aluminum	**1,500**
Iron	**2,600**
Sodium	**52,000**
Pesticides (ug/l)	
Pesticides	ND
PCB (ug/l)	
PCBs	ND

ANALYTE	NYSDEC TOGS 1.1.1 AWQS
Metals Total (ug/l)	
Aluminum	100
Arsenic	25
Barium	1000
Beryllium	3
Cadmium	5
Chromium	50
Copper	200
Iron	300
Lead	25
Magnesium	35000
Nickel	100
Silver	50
Sodium	20000
Thallium	0.5
Vanadium	14
Zinc	5000
Metals Dissolved (ug/l)	
Aluminum	100
Antimony	3
Arsenic	25
Barium	1000
Beryllium	3
Chromium	50
Copper	200
Iron	300
Lead	25
Magnesium	35000
Manganese	300
Nickel	100
Sodium	20000
Vanadium	14
Pesticides (ug/l)	
Pesticides	-
PCB (ug/l)	
PCBs	-

LEGEND:

- EB-1/W-1 — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012
- EB-5 — BORING LOCATION - LANGAN AUGUST 2012
- SV-1 — SOIL VAPOR LOCATION - LANGAN AUGUST 2012
- SB-9/MW-4 — BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007
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30 0 15 30
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Date	Description	No.
Revisions		

NAME
PROFESSIONAL XXXXXXXXXXXXX N.J. LIC. No.XXXXX
DATE

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Collectively known as Langan

Project
HIGHLINE 28-29 DEVELOPMENT
NEW YORK NEW YORK

Drawing Title
GROUNDWATER SAMPLE LOCATION AND METALS, PESTICIDES, AND PCBS RESULTS PLAN

Project No. **170190002**	Drawing No. 14
Date 9/18/2012	
Scale 1" = 30'	
Drn. By JPA	
Last Revised	14 Of 15

Filename: \\langan.com\data\NY\data0\170190002\Cadd Data – 170190002\SIR\Figure 14 – Metals Groundwater Detections.dwg Date: 1/4/2013 Time: 12:35 User: jgood Style Table: Langan.stb Layout: D Size Sheet (Bottom)

SV-1	
SAMPLE ID	**SV1-081712**
SAMPLING DATE	**8/17/2012**
VOCs (mg/m3)	
1,2,4-Trimethylbenzene	3.07
2-Butanone (MEK)	5.66
Acetone	198
Benzene	4.63
Carbon disulfide	1.55
Chloroform	5.32
Cyclohexane	0.888
Dichlorodifluoromethane (Freon12)	1.3
Ethanol	104
Ethylbenzene	1.87
Heptane	3.29
Isopropanol	7.03
m,p-Xylene	6.6
Methylene chloride	12.1
n-Hexane	6.1
o-Xylene	2.34
Propylene	1.44
Tetrachloroethene	38.4
Toluene	18.1
trans-1,2-Dichloroethene	1.3
Trichloroethene	4.71
Trichlorofluoromethane (Freon 11)	74.2
2,2,4-Trimethylpentane	3.19

SV-2	
SAMPLE ID	**SV2-081712**
SAMPLING DATE	**8/17/2012**
VOCs (mg/m3)	
1,1,1-Trichloroethane	1.86
1,2,4-Trimethylbenzene	39.1
1,3,5-Trimethylbenzene	14.2
2-Butanone (MEK)	42.2
4-Methyl-2-pentanone (MIBK)	14.5
Acetone	157
Benzene	15.6
Carbon disulfide	2.01
Chloroform	20.8
cis-1,2-Dichloroethene	1.27
Cyclohexane	9.12
Dichlorodifluoromethane (Freon12)	1.51
Ethanol	141
Ethyl acetate	10.1
Ethylbenzene	42.8
4-Ethyltoluene	13.2
Heptane	33.8
Isopropanol	7.1
m,p-Xylene	147
n-Hexane	31
o-Xylene	57.3
Styrene	2.84
Tetrachloroethene	14.9
Tetrahydrofuran	8.26
Toluene	192
Trichloroethene	10.9
Trichlorofluoromethane (Freon 11)	284
2,2,4-Trimethylpentane	128

SV-3	
SAMPLE ID	**SV3-082212**
SAMPLING DATE	**8/22/2012**
VOCs (mg/m3)	
cis-1,2-Dichloroethene	646
Trichlorofluoromethane (Freon 11)	143000

SV-4	
SAMPLE ID	**SV4-082212**
SAMPLING DATE	**8/22/2012**
VOCs (mg/m3)	
1,1,1-Trichloroethane	1.46
1,2,4-Trimethylbenzene	1.72
1,3-Dichlorobenzene	4.7
2-Butanone (MEK)	4.28
Acetone	106
Benzene	2.11
Carbon disulfide	1.43
Chloroform	9.96
Chloromethane	0.578
Cyclohexane	0.823
Dichlorodifluoromethane (Freon12)	1.26
Ethanol	154
Ethylbenzene	1.56
Heptane	1.98
Isopropanol	7.82
m,p-Xylene	5.26
n-Hexane	1.22
o-Xylene	1.81
Propylene	2.12
Tetrachloroethene	13.1
Toluene	10.8
trans-1,2-Dichloroethene	1.09
Trichloroethene	2.56
Trichlorofluoromethane (Freon 11)	2.23
2,2,4-Trimethylpentane	1.39
Vinyl acetate	0.827

SV-5		
SAMPLE ID	**SV5-082212**	
SAMPLING DATE	**8/22/2012**	
VOCs (mg/m3)		
1,1,1-Trichloroethane	9600	D26.67
1,1-Dichloroethane	161	
1,1-Dichloroethene	24.8	
Acetone	387	
Benzene	15.3	
Chloroform	136	
cis-1,2-Dichloroethene	362	
Ethanol	96.1	
Ethylbenzene	47.8	
Heptane	117	
m,p-Xylene	208	
o-Xylene	44.7	
Styrene	33.6	
Tetrachloroethene	16300	D26.67
Toluene	3100	
trans-1,2-Dichloroethene	42	
Trichloroethene	372	

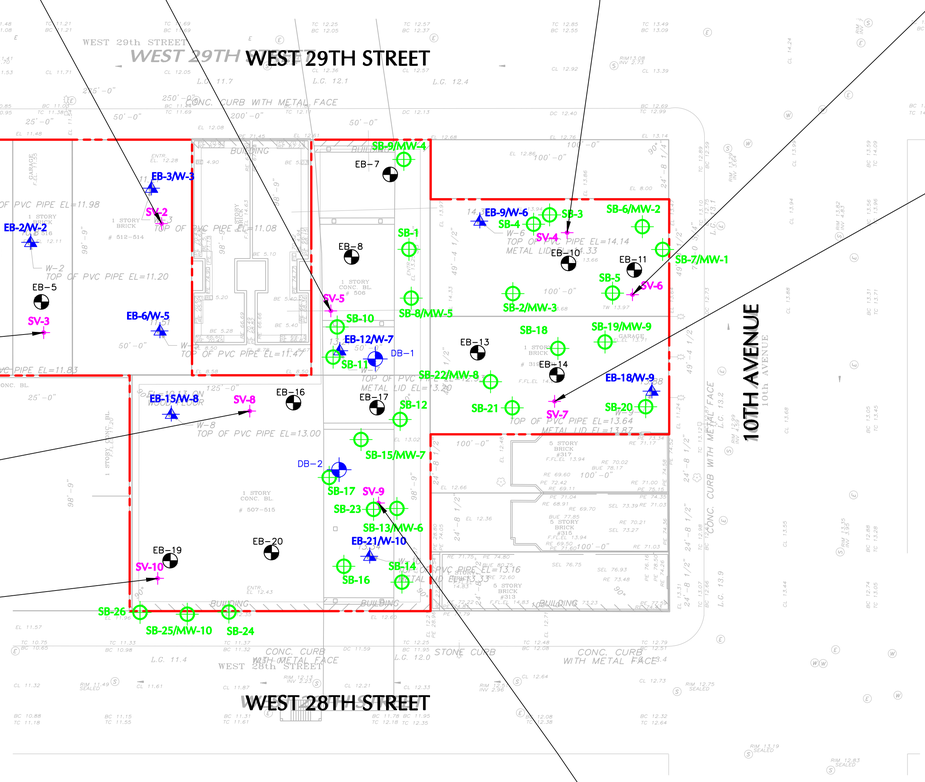
SV-6	
SAMPLE ID	**SV5-081712**
SAMPLING DATE	**8/17/2012**
VOCs (mg/m3)	
1,1,1-Trichloroethane	37.9
1,2,4-Trimethylbenzene	42.6
1,3,5-Trimethylbenzene	14.8
2-Butanone (MEK)	31.8
4-Methyl-2-pentanone (MIBK)	13
Acetone	328
Benzene	7.48
Carbon disulfide	2.24
Chloroform	20.3
cis-1,2-Dichloroethene	1.8
Cyclohexane	4.92
Ethanol	95.7
Ethyl acetate	8.94
Ethylbenzene	34.9
4-Ethyltoluene	13.2
Heptane	12.7
Isopropanol	7.52
m,p-Xylene	119
n-Hexane	9.66
o-Xylene	48.2
Styrene	2.59
Tetrachloroethene	73.2
Tetrahydrofuran	7.76
Toluene	127
Trichloroethene	6.02
Trichlorofluoromethane (Freon 11)	2.28
2,2,4-Trimethylpentane	48.1

SV-7	
SAMPLE ID	**SV7-081712**
SAMPLING DATE	**8/17/2012**
VOCs (mg/m3)	
1,1,1-Trichloroethane	8.24
1,2,4-Trimethylbenzene	48.4
1,3,5-Trimethylbenzene	16.2
2-Butanone (MEK)	35.4
4-Methyl-2-pentanone (MIBK)	11.2
Acetone	264
Benzene	10.1
Carbon disulfide	1.58
Chloroform	6.49
Cyclohexane	7.47
Ethanol	149
Ethyl acetate	7.75
Ethylbenzene	38.6
4-Ethyltoluene	14.4
Heptane	17.1
Isopropanol	6.76
m,p-Xylene	132
n-Hexane	14.6
o-Xylene	54.7
Styrene	2.4
Tetrachloroethene	37.2
Tetrahydrofuran	7.9
Toluene	155
Trichloroethene	7.74
Trichlorofluoromethane (Freon 11)	3.6
2,2,4-Trimethylpentane	93.9

SV-8	
SAMPLE ID	**SV8-081712**
SAMPLING DATE	**8/17/2012**
VOCs (mg/m3)	
1,1,1-Trichloroethane	4370
1,1-Dichloroethane	202
1,1-Dichloroethene	278
1,2,4-Trimethylbenzene	37.4
1,3,5-Trimethylbenzene	13.1
2-Butanone (MEK)	18.5
Acetone	75.5
Benzene	15.7
Chloroform	11.8
cis-1,2-Dichloroethene	303
Cyclohexane	10.2
Ethanol	105
Ethylbenzene	33.4
4-Ethyltoluene	12.6
Heptane	22.5
m,p-Xylene	122
n-Hexane	28.4
o-Xylene	45.2
Tetrachloroethene	200
Toluene	167
trans-1,2-Dichloroethene	44.4
Trichloroethene	75.8
2,2,4-Trimethylpentane	113

SV-10	
SAMPLE ID	**SV10-081712**
SAMPLING DATE	**8/17/2012**
VOCs (mg/m3)	
1,1,1-Trichloroethane	196
1,1-Dichloroethane	5.83
1,2,4-Trimethylbenzene	59.5
1,3,5-Trimethylbenzene	15.8
2-Butanone (MEK)	38.3
4-Methyl-2-pentanone (MIBK)	11.6
Acetone	138
Benzene	24.8
Carbon disulfide	3.42
Chloroform	12.1
cis-1,2-Dichloroethene	18.2
Cyclohexane	13.9
Dichlorodifluoromethane (Freon12)	1.11
Ethanol	158
Ethyl acetate	11
Ethylbenzene	49.1
4-Ethyltoluene	14.7
Heptane	48.4
Isopropanol	6.44
m,p-Xylene	175
n-Hexane	56.7
o-Xylene	63.4
Styrene	3
Tetrachloroethene	22.7
Tetrahydrofuran	6.99
Toluene	245
trans-1,2-Dichloroethene	1.04
Trichloroethene	8.71
Trichlorofluoromethane (Freon 11)	4.05
2,2,4-Trimethylpentane	155

SV-9	
SAMPLE ID	**SV9-082212**
SAMPLING DATE	**8/22/2012**
VOCs (mg/m3)	
1,1,1-Trichloroethane	3640
1,1-Dichloroethane	57.9
1,1-Dichloroethene	41.2
1,2,4-Trimethylbenzene	17.4
Acetone	245
Chloroform	12.9
cis-1,2-Dichloroethene	25.2
Ethanol	188
Ethylbenzene	18.3
4-Ethyltoluene	12.4
Heptane	42.2
Isopropanol	13.1
m,p-Xylene	80.4
Methylene chloride	30.7
o-Xylene	18.5
Propylene	12.1
Styrene	12.3
Tetrachloroethene	1050
Toluene	976
Trichloroethene	38.5



ANALYTE	NYSDOH AGV	NYSDOH 2003 Fuel Oil Indoor Air Upper Fence Value	EPA 2001 Base Database: 90 Percentile Indoor Air	HEI 2005 95 Percentile Indoor Air
VOC (mg/m3)				
1,1,1-Trichloroethane	-	2.5	20.6	-
1,1-Dichloroethane	-	0.4	<0.7	-
1,1-Dichloroethene	-	0.4	<1.4	-
1,2,4-Trimethylbenzene	-	9.8	9.5	-
1,3,5-Trimethylbenzene	-	3.9	3.7	-
1,3-Dichlorobenzene	-	3.9	<2.4	-
2-Butanone (MEK)	-	16	12	-
4-Methyl-2-pentanone (MIBK)	-	1.9	-	-
Acetone	-	115	98.9	45.8
Benzene	-	13	9.4	10
Carbon disulfide	-	-	4.2	-
Chloroform	-	1.2	1.1	6.34
Chloromethane	-	4.2	3.7	-
cis-1,2-Dichloroethene	-	0.4	<1.9	-
Cyclohexane	-	6.3	-	-
Dichlorodifluoromethane (Freon12)	-	10	16.5	-
Ethanol	-	-	210	-
Ethyl acetate	-	-	5.4	-
Ethylbenzene	-	6.4	5.7	7.62
4-Ethyltoluene		-	3.6	-
Heptane		-	-	-
Isopropanol		-	-	-
m,p-Xylene	-	11	22.2	22.2
Methylene chloride	60	16	10	7.5
n-Hexane	-	-	-	-
o-Xylene	-	7.1	7.9	7.24
Propylene	-	-	-	-
Styrene	-	1.4	40	5.13
Tetrachloroethene	100	2.5	15.9	6.01
Tetrahydrofuran	-	0.8	-	-
Toluene	-	57	43	39.8
trans-1,2-Dichloroethene	-	-	-	-
Trichloroethene	5	0.5	4.2	1.36
Trichlorofluoromethane (Freon 11)	-	12	3.5	-
2,2,4-Trimethylpentane	-	-	-	-
Vinyl acetate	-	-	-	-

LEGEND:

- **EB-1/W-1** — BORING/MONITORING WELL LOCATIONS - LANGAN AUGUST 2012
- **EB-5** — BORING LOCATION - LANGAN AUGUST 2012
- **SV-1** — SOIL VAPOR LOCATION - LANGAN AUGUST 2012
- **SB-9/MW-4** — BORING/MONITORING WELL LOCATIONS - GZA OCTOBER/NOVEMBER 2007
- DEVELOPMENT FOOTPRINT

30 0 15 30
SCALE IN FEET

GENERAL NOTES

1. BASE PLAN TITLED TOPOGRAPHIC SURVEY PREPARED BY PRECISION SURVEYS DATED MARCH 14, 2012.
2. ANALYTICAL RESULTS WERE COMPARED TO NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH) AIR GUIDLINE VALUES (AGV), US ENVIRONMENTAL PROTECTION AGENCY (EPA) BASE DATABASE 90TH PERCENTILE INDOOR AIR, AND HEALTH EFFECTS INSTITUTE (HEI) 2005 95TH PERCENTILE INDOOR AIR.
3. ONLY DETECTED COMPOUNDS ARE SHOWN ON FIGURE.
4. VOC = VOLATILE ORGANIC COMPOUNDS
5. ug/m3 = MICROGRAM PER CUBIC METER
6. ND = NO DETECTION
7. ALL ELEVATIONS CONTAINED WITHIN THIS DRAWING REFERENCE THE BOROUGH PRESIDENT OF MANHATTAN DATUM (BPMD) WHICH IS 2.75 FT ABOVE MEAN SEA LEVEL AT SANDY HOOK NJ AS DEFINED BY THE UNITED STATES GEOLOGIC SURVEY (USGS NGVD 1929)
8. ALL WELL LOCATIONS ARE APPROXIMATE

DRAFT

Date	Description	No.
Revisions		

NAME PROFESSIONAL XXXXXXXXXXXXX N.J. LIC. No.XXXXX DATE

LANGAN
21 Penn Plaza, 360 West 31st Street, 8th Floor, New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com
NEW JERSEY NEW YORK VIRGINIA CALIFORNIA PENNSYLVANIA CONNECTICUT FLORIDA
ABU DHABI ATHENS DOHA DUBAI ISTANBUL
Langan Engineering and Environmental Services, Inc.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan International LLC
Collectively known as Langan

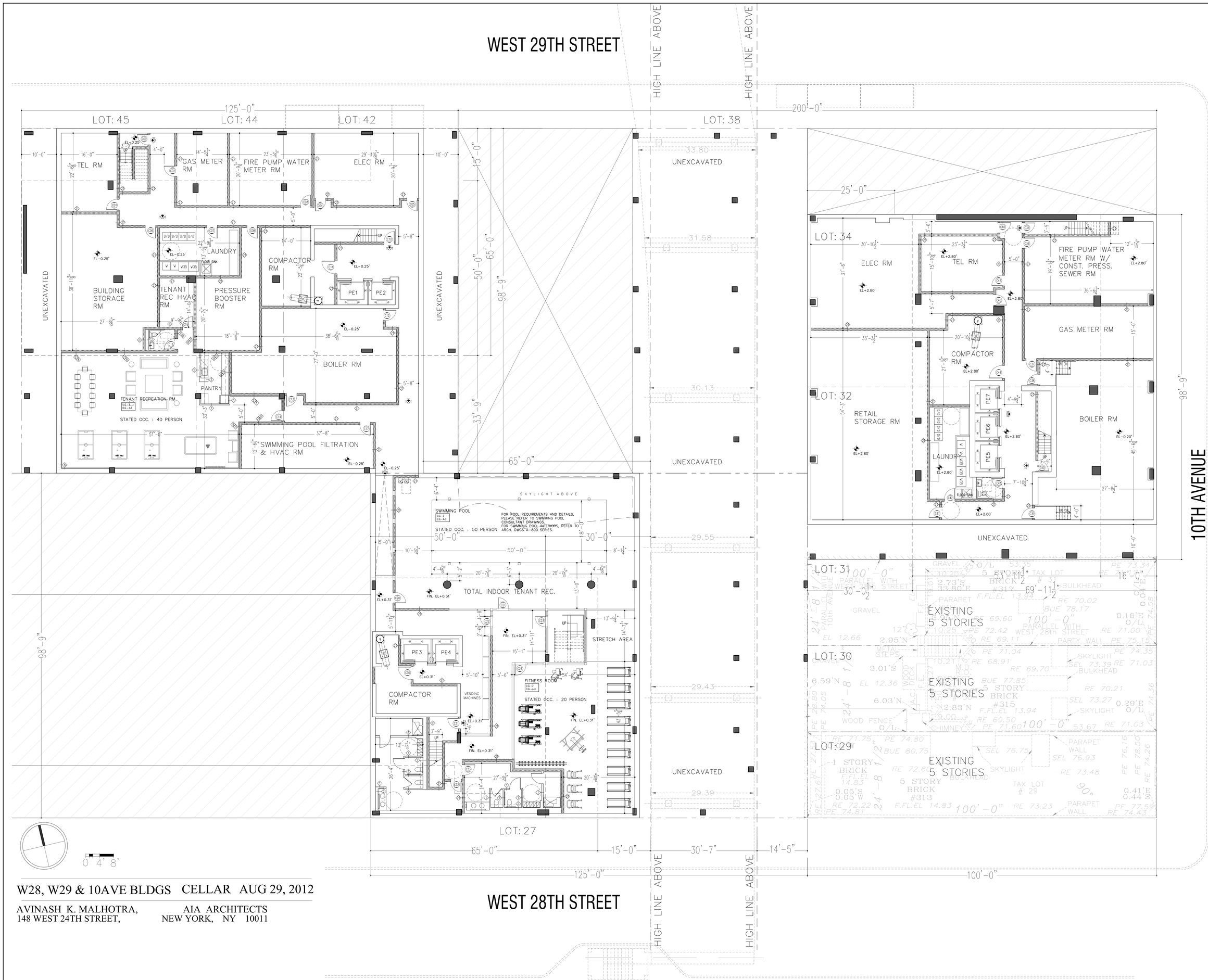
Project	HIGHLINE 28-29 DEVELOPMENT
	NEW YORK NEW YORK
Drawing Title	SOIL VAPOR SAMPLE LOCATION AND RESULTS PLAN
Project No.	170190002
Date	9/18/2012
Scale	1" = 30'
Drn. By	JPA
Last Revised	
Drawing No.	15
	15 Of 15

Filename: \\langan.com\data\NY\data0\170190002\SIR\Figure 15 - VOC Soil Vapor Detections.dwg Date: 1/4/2013 Time: 09:35 User: jgood Style Table: Langan.stb Layout: D Size Sheet (Bottom)

TABLES

APPENDIX A- PREVIOUS ENVIRONMENTAL REPORTS

APPENDIX B- PROPOSED DEVELOPMENT PLANS



0' 4' 8'

W28, W29 & 10AVE BLDGS CELLAR AUG 29, 2012

AVINASH K. MALHOTRA, AIA ARCHITECTS
148 WEST 24TH STREET, NEW YORK, NY 10011

DOB BSCAN STICKER

DOB STAMPS/SIGNATURES

NOT FOR CONSTRUCTION

AUG-29-2012	PROGRESS SET
AUG-1-2012	HPD FILING
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Date	

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MEP ENGINEERS (212)-944-5566

CONSTRUCTION CONSULTING ASSOC.
CODE CONSULTANTS (212)-385-1818
SUITE 1625, 100 CHURCH STREET, NEW YORK

OWNER:
KADIMA TENTH AVENUE, LLC.

SEAL & SIGNATURE

PROJECT:

HIGH LINE
507-515 WEST 28TH STREET
NEW YORK CITY

CELLAR LEVEL PLAN

DATE:	
SCALE:	AS NOTED
PROJECT NO:	
DRAWING BY:	
CHECKED BY:	
DWG. NUMBER:	A-100.00
CAD FILE NO.:	PAGE

WEST 29TH STREET

LOT: 45

LOT: 44

LOT: 42

LOT: 38

LOT: 34

LOT: 32

LOT: 31

LOT: 30

LOT: 29

LOT: 27

ACCESSORY ATTENDED PARKING GARAGE
UG - 1
GS - 12
GROSS FLOOA AREA 7,243 GSF
UNOBSTRUCTED SURFACE AREA 5,796 SF
MAX. NO. OF CAR PERMITTED
=UNOBSTRUCTED AREA / 200 SQFT PER CAR
=5796/200=~28.98 OR 29 CARS
TYP: PROVIDE METAL GUARD RAILING
PROTECTION AROUND ALL PIPES
AND DUCTS THROUGH PARKING. REFER MEP
DWGS FOR LOCATION
PROVIDE CORNER GUARDS AT ALL CONC.CMU.
THROUGH PARKING. REFER TO ARCH DWG A-009

REMOTENESS OF EXITS
PROVIDED MAX. OVERALL DIAGONAL DIMENSION = 147'-6" (REFER PLAN)
MIN. REQ'D DISTANCE BETWEEN EXITS:185'-2" /3 = 49'-2" (SPRINKLERED BUILDING)
PROVIDED: BETWEEN EXIT DOORS 103 AND 115 = 77'-6"
OCCUPANCY CALCULATIONS:
5,796 SQFT/GSF / 200 SQFT/GSF/OCC = 28.98 = 9.5 = 39 PERSONS
TOTAL WIDTH OF MEANS OF EGRESS :
REQUIRED: 39 X 0.2 = 7.8"
PROVIDED: 2=0" X 2 = 6'-0" = 72"

BICYCLE STORAGE RM
2,857 GSF
2,857 / 15 SF PER BIKE
190 BIKES

PASSENGER LOADING ZONE
8'-85" MIN. VERTICAL CLEARANCE

VAN-ACCESSIBLE PARKING
98"MIN. VERTICAL CLEARANCE

H.C. VAN

RAMP

SVR RM

PE1

PE2

MECH RM

SKYLIGHT ABOVE

OPENING TO CELLAR BELOW

ELECTRIC

MAILROOM

OPENING TO CELLAR BELOW

RESIDENTIAL LOBBY

PACKAGE ROOM

HIGH CEILING AREA

HIGH LINE ABOVE

NOTE:
ALL COMMERCIAL TENANT WORK
INCLUDING SANITARY/PLUMBING WORK
SHALL BE FILED SEPARATELY

RETAIL 1B
UG - 6
GG - M
5,390 GSF

RETAIL SPACE 1A +1B
TOTAL GROSS FA. - 5,540 + 5,390 = 10,930 GSF
REMOTENESS OF EXITS
PROVIDED MAX. OVERALL DIAGONAL DIMENSION = 185'-2" (REFER PLAN)
MIN. REQ'D DISTANCE BETWEEN EXITS:185'-2" /3 = 61'-9" (SPRINKLERED BUILDING)
PROVIDED: BETWEEN EXIT DOORS 107 AND 110 = 165'-9"
OCCUPANCY CALCULATIONS:
10,912 SQ. FT = 364 PERSONS
30 SQ FT/ PERSON
TOTAL WIDTH OF MEANS OF EGRESS :
REQUIRED: 364 X 0.2 =72.8"
PROVIDED: 6'-0" X 2 = 144"

RETAIL 1A
UG - 6
GG - M

MECH RM

RETAIL SPACE NO. 2
GROSS FA. - 5,039 GSF
REMOTENESS OF EXITS
PROVIDED MAX. OVERALL DIAGONAL DIMENSION = 157'-9" (REFER PLAN)
MIN. REQ'D DISTANCE BETWEEN EXITS 157'-9" /3 = 35'-11" (SPRINKLERED BUILDING)
PROVIDED: BETWEEN EXIT DOORS 113 AND 115 = 41'-1½"
OCCUPANCY CALCULATIONS:
5,039 SQ. FT = 168 PERSONS
30 SQ FT/ PERSON
TOTAL WIDTH OF MEANS OF EGRESS :
REQUIRED: 168 X 0.2 = 35.2"
PROVIDED: 6'-0" + 3'-0" + 3'-9" = 168"

RETAIL 2
UG - 6
GG - M

NOTE:
ALL COMMERCIAL TENANT WORK
INCLUDING SANITARY/PLUMBING WORK
SHALL BE FILED SEPARATELY

RETAIL SPACE GROSS FA. - 455 GSF
OCCUPANCY CALCULATIONS:
455 SQ.FT = 15 PERSONS
30 SQ FT/PERSON
TOTAL WIDTH OF MEANS OF EGRESS :
REQUIRED: 15 X 0.2 = 3
PROVIDED: 3'-0" = 36

RETAIL 3
UG - 6
GG - M
455 GSF

HIGHLINE EASTMENT
353 SF

NOTE:
ALL COMMERCIAL TENANT WORK
INCLUDING SANITARY/PLUMBING WORK
SHALL BE FILED SEPARATELY

AREA UNDER CONSTRUCTION

PARALLEL WITH WEST 29th STREET

PARALLEL WITH WEST 28th STREET

TAX LOT# 36 NOT INCLUDED

TAX LOT #40 NOT INCLUDED

TAX LOT # 38

TAX LOT # 27

TAX LOT # 29

EXISTING 5 STORIES

10TH AVENUE

0 4' 8'

AUG 29, 2012

W28, W29 & 10AVE BLDGS 1 ST FLOOR

AVINASH K. MALHOTRA, AIA ARCHITECTS
148 WEST 24TH STREET, NEW YORK, NY 10011

WEST 28TH STREET

DOB BSCAN STICKER

DOB STAMPS/SIGNATURES

NOT FOR CONSTRUCTION

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CONSTRUCTION CONSULTING ASSOC.
CODE CONSULTANTS (212)-385-1818
SUITE 1625, 100 CHURCH STREET, NEW YORK

OWNER:
KADIMA TENTH AVENUE, LLC.

SEAL & SIGNATURE

PROJECT:

HIGH LINE
507-515 WEST 28TH STREET
NEW YORK CITY

1ST FLOOR PLAN

DATE:	
SCALE: AS NOTED	
PROJECT NO:	
DRAWING BY:	
CHECKED BY:	
DWG. NUMBER:	A-101.00
CAD FILE NO.:	PAGE

WEST 29TH STREET

LOT: 45 | LOT: 44 | LOT: 42 | LOT: 38 | LOT: 34 | LOT: 32 | LOT: 31 | LOT: 30 | LOT: 29 | LOT: 27

125'-0" | 200'-0" | 65'-0" | 15'-0" | 30'-0" | 100'-0"

ACCESSORY ATTENDED PARKING GARAGE

BS-2
BUL-1B

GROSS FLOOA AREA :10,725 GSF
UNOBSTRUCTED SURFACE AREA :9,758 SF
NO. OF CAR PERMITTED
=UNOBSTRUCTED AREA / 200 SQFT PER CAR
=9758/200=48.79 OR 49 CARS

TYP: PROVIDE METAL GUARD RAILING PROTECTION AROUND ALL PIPES AND DUCTS THROUGH PARKING, REFER MEP DWGS FOR LOCATION
PROVIDE CORNER GUARDS AT ALL CONC/CMU
THROUGH PARKING, REFER TO ARCH DWG A-409

REMOTENESS OF EXITS
PROVIDED MAX. OVERALL DIAGONAL DIMENSION = 151'-0" (REFER PLAN)
MIN. REQD DISTANCE BETWEEN EXITS:149'-0" /3 = 50'-4" (SPRINKLERED BUILDING)
PROVIDED: BETWEEN EXIT DOORS 201 AND 202 = 85'-2"

OCCUPANCY CALCULATIONS:
9,758 SF
200 SQFT PER OCC = 48.79 = 49 PERSONS

TOTAL WIDTH OF MEANS OF EGRESS :
REQUIRED: 49 X 0.2 = 9.8"
PROVIDED: 3'-0" X 2 = 6'-0" = 72"

PE1 | PE2 | PE3 | PE4 | PE5 | PE6 | PE7

OPENING TO RESIDENTIAL CORRIDOR BELOW
OPENING TO RETAIL BELOW
OPENING TO MECH ROOM BELOW
OPENING TO CELLAR BELOW
OPENING TO ROJUNDA BELOW
OPENING TO MAILROOM BELOW
OPENING TO RESIDENTIAL LOBBY BELOW
OPENING TO BELOW
SKYLIGHT ABOVE
HIGH LINE ABOVE
HIGH CEILING AREA
1:7 RAMP
EXISTING 5 STORIES BRICK
GRAVEL
PARAPET WALL
BULKHEAD
METAL STEPS
WOOD FENCE
CHIMNEY
SKYLIGHT

10TH AVENUE

AUG 29, 2012

W28, W29 & 10AVE BLDGS 2ND FLOOR

AVINASH K. MALHOTRA, AIA ARCHITECTS
148 WEST 24TH STREET, NEW YORK, NY 10011

DOB BSCAN STICKER

DOB STAMPS/SIGNATURES

NOT FOR CONSTRUCTION

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Date	

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OWNER:
KADIMA TENTH AVENUE, LLC.

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PROJECT:
HIGH LINE
507-515 WEST 28TH STREET
NEW YORK CITY

2ND FLOOR PLAN

DATE:
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PROJECT NO:
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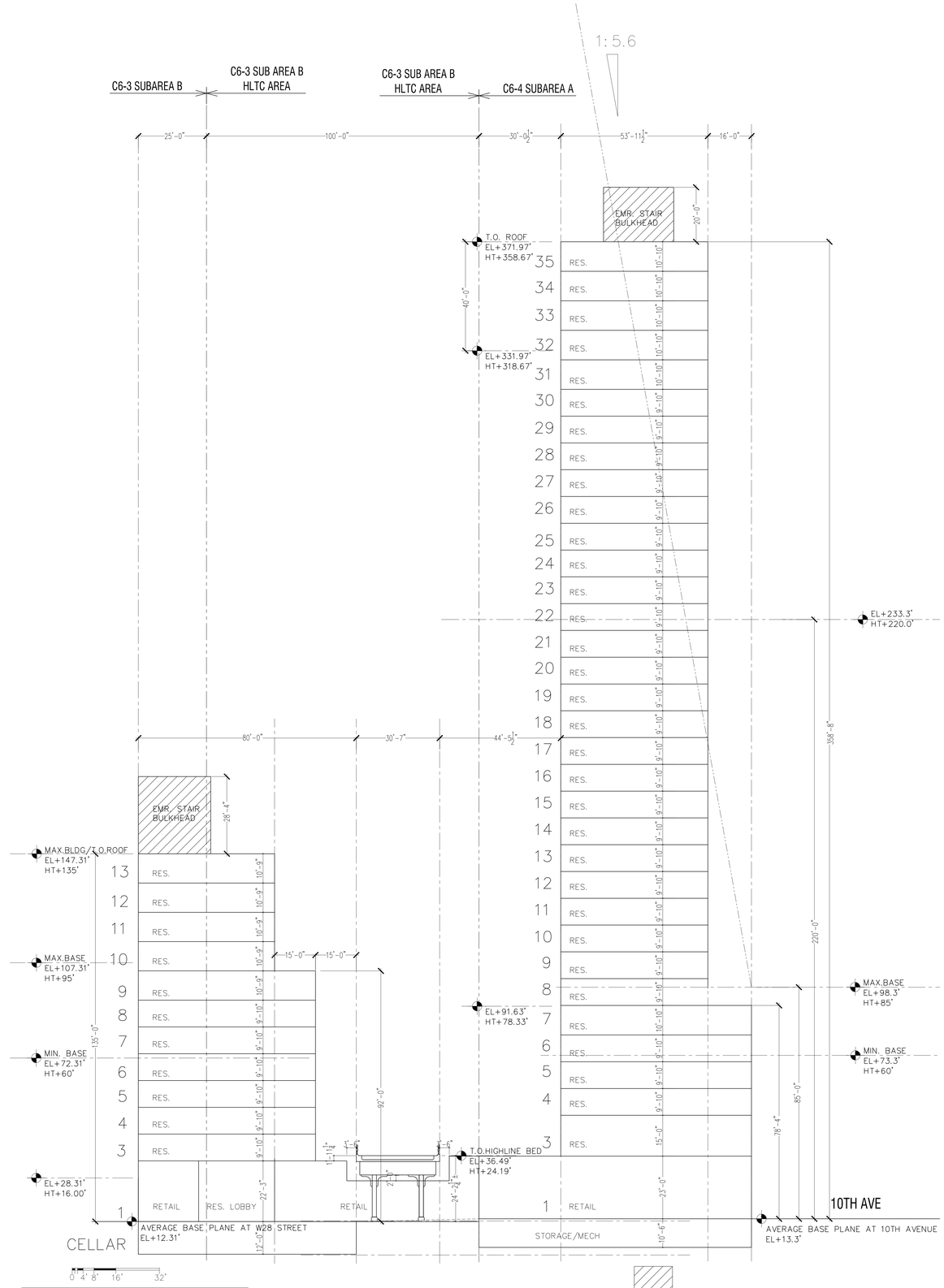
DWG. NUMBER:
A-102.00

CAD FILE NO.: PAGE

HEIGHT AND SETBACK DIAGRAM
SECTION DIAGRAM A



HEIGHT AND SETBACK DIAGRAM
SECTION DIAGRAM B

DOB BSCAN STICKER

DOB STAMPS/SIGNATURES

NOT FOR CONSTRUCTION

Date	
JUN-27-2012	PROGRESS SET / FOR REVIEW ONLY
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KADIMA TENTH AVENUE, LLC.

SEAL & SIGNATURE

PROJECT:
HIGH LINE
507-515 WEST 28TH STREET
NEW YORK CITY

BUILDING SECTIONS

DATE:
PROJECT NO:
DRAWING BY:
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DWG. NUMBER:
A-201.00

CAD FILE NO.: PAGE

APPENDIX C- GEOPHYSICAL REPORT

NOVA GEOPHYSICAL SERVICES

SUBSURFACE MAPPING SOLUTIONS
56-01 Marathon Parkway, PO Box 765, Douglaston, New York 11362
Ph. 347-556-7787 Fax. 718-261-1527
www.nova-gsi.com

August 13, 2012

Joseph Good, LEED AP
Senior Staff Engineer
Langan Engineering & Environmental Services
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380 West 31st STreet
New York, New York 10001
Direct: 212.479.5448
Email: jgood@langan.com

Re: Geophysical Survey Report
Highline 28-29
516 West 29th Street
Manhattan, New York

Dear Mr. Good:

Nova Geophysical Services (NOVA) is pleased to provide findings of our geophysical survey at the above referenced project site located at Highline 28-29: 516 West 29th Street, Manhattan, New York City, New York (the "Site"). Please see attached Geophysical Survey map for more details.

INTRODUCTION TO GEOPHYSICAL SURVEY

NOVA performed a Geophysical survey consisting of Ground Penetrating Radar (GPR), Electromagnetic (EM) surveys and comprehensive subsurface utility (CSUL) surveys at the project Site. The purpose of this survey is to locate and identify current and former utilities, on-site septic system, anomalies, subsurface structures, and to clear and mark proposed boring locations located at the project site on August 9, 2012.

The equipment selected for this investigation will be included a CSUL Pipe and Cable Locator (an magnetic detector), Ditch-Witch utility locator, Electromagnetic detector (GSSI - Profiler EM), Software & Sensors 250 MHz ground penetrating radar (GPR) antenna.

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

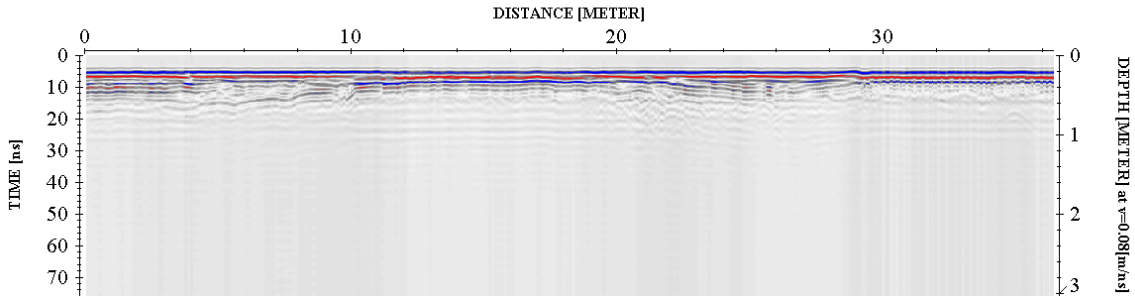
The project site was first screened using the Geonics(tm) electromagnetic detector by carrying the instrument over the boring locations at the site in 5' x 5' traverses. When evidence of anomalies were observed, the Ditch-witch(tm) utility locator was then used to determine if the anomalies were utilities or other large sub-surface metal objects. Finally, GPR profiles were collected over each metal-detector anomaly and inspected for reflections, which could be indicative of major anomalies.

GPR data profiles were collected for the areas of the Site specified by the client. The surveyed areas consisted of paved and none paved areas.

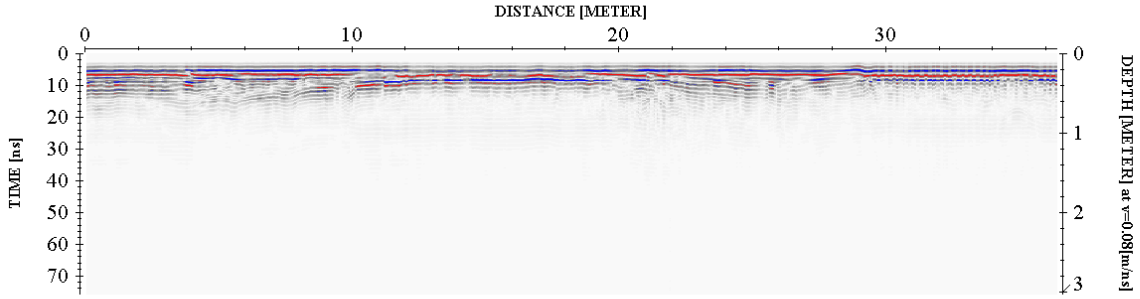
DATA PROCESSING

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.

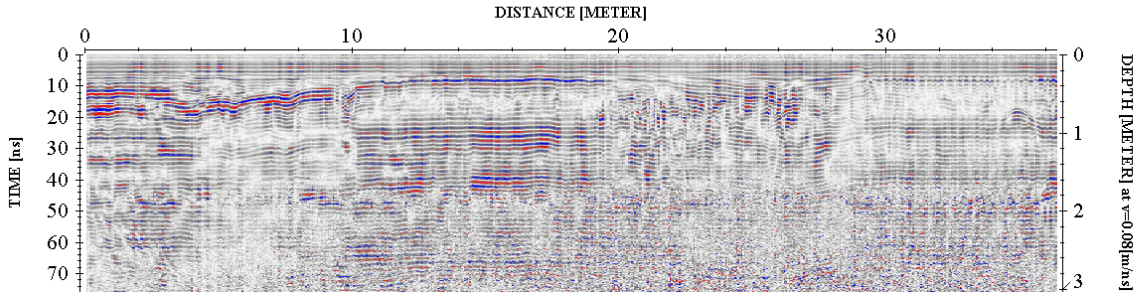
Step 1. Import raw RAMAC data to standard processing format



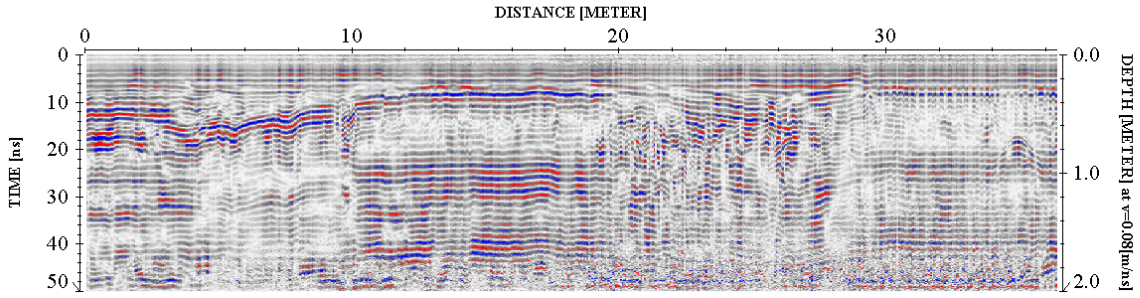
Step 2. Remove instrument noise *(dewow)*



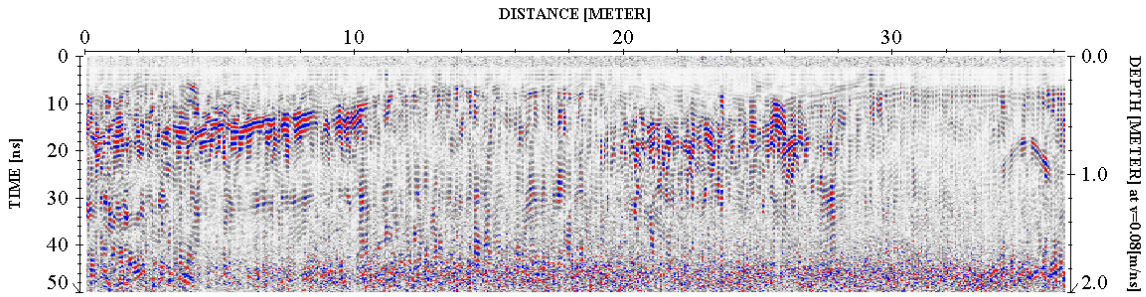
Step 3. Correct for attenuation losses *(energy decay function)*



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: Sunny.
Temp: approximately 84 degrees.
Surface: Concrete paved sidewalks, concrete flooring, and exposed surface soil
Geophysical Noise Level (GNL): Geophysical Noise Level (GNL) was medium at the time of the survey due to on-going traffic, surroundings and construction materials.

RESULTS

The results of the geophysical survey identified the following anomalies located at the project Site:

- Geophysical survey identified subsurface anomalies consistant with former utility lines (water, sewer, electric and telecommunication lines) located throughout of the project site.

- Geophysical survey identified minor / scattered anomalies located within the project site. Based their reflection rate and proximity, none of these anomalies were indicative of USTs.

- Nova cleared and marked all of the proposed boring locations at the project site.

- 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

NOVA
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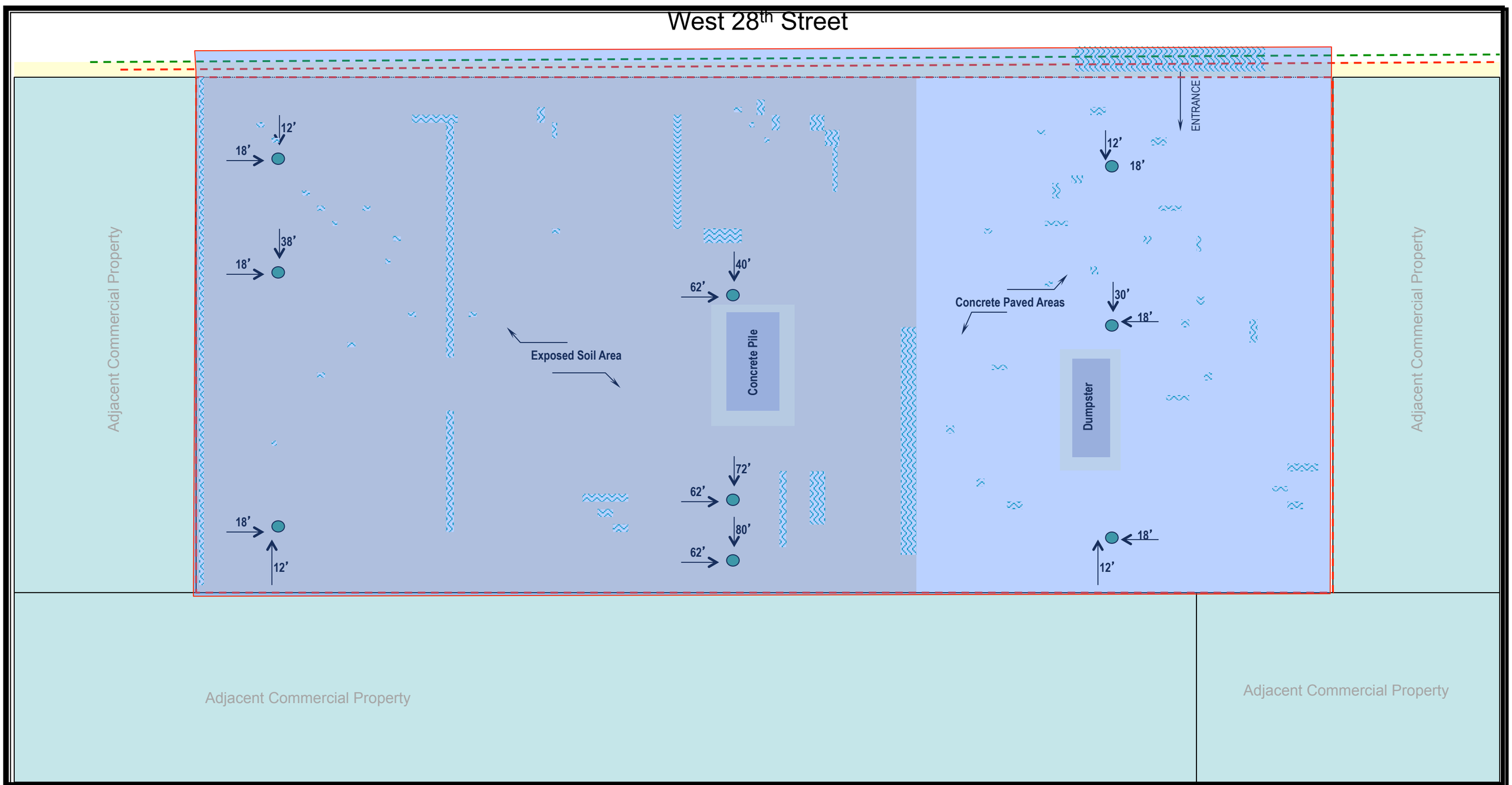
Subsurface Mapping Solutions
56-01 Marathon Pkwy, PO Box 765, Douglaston, NY11362
(718) 261-1527 Fax (718) 261-1528
www.nova-gsi.com

SITE: **Vacant Lot**
Highline 28 -29
516 West 29th Street
Manhattan, New York

SCALE: Not to Scale



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GEOPHYSICAL SURVEY SITE PLAN

SITE: High Line 28 - 29 516 West 29th Street, New York, New York
CLIENT: **Langan Engineering & Environmental Services**
SCALE: Not To Scale
DATE : 08/09/12

INFORMATION

- GPR/EM Surveyed Areas 07/14/12
- Soil Boring Locations
- Area not able to be surveyed
- Underground Piping (Sewer & Electric)
- Scattered/ Anomaly
- N

GEOPHYSICAL IMAGES
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516 West 29th Street, New York, New York
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