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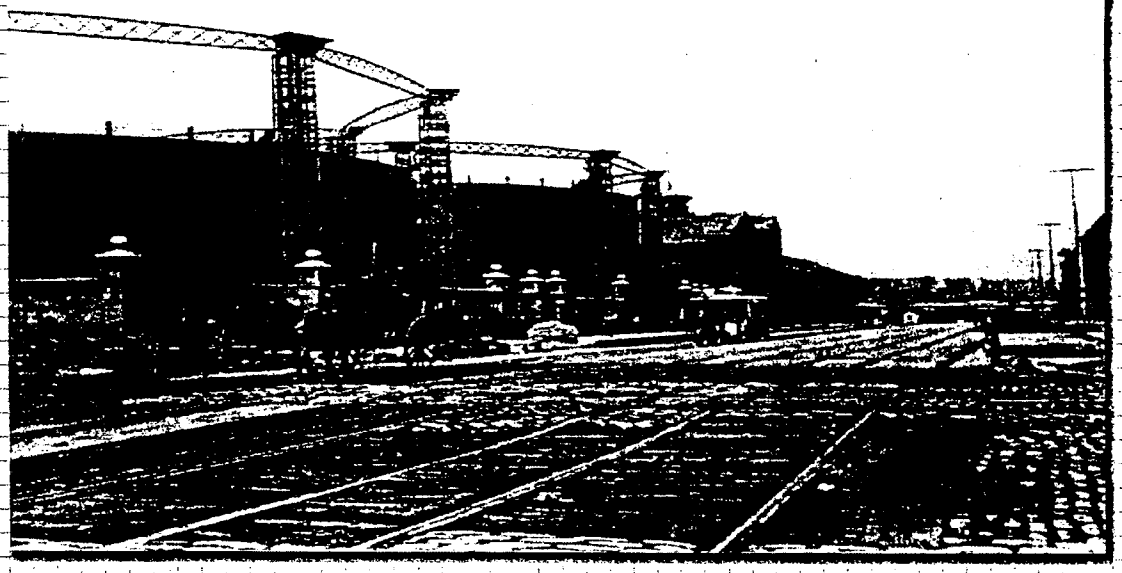
Consolidated Edison Company of New York, Inc.

Site Characterization Report

West 42nd Street Former Manufactured Gas Plant Site
Voluntary Cleanup Agreement
Index No. D2-0003-02-08; Site ID V00531



April 2004

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

RLA/JOBS/CNED2085(01/21/04)

WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

SITE CHARACTERIZATION REPORT

Prepared for:

CONSOLIDATED EDISON COMPANY
OF NEW YORK, INC.
31-01 20th Avenue, Building 138
Long Island City, New York

Prepared by:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
330 Crossways Park Drive
Woodbury, New York

APRIL 2004

WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE
SITE CHARACTERIZATION REPORT

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ES.0 EXECUTIVE SUMMARY

Introduction

The Consolidated Edison Company of New York, Inc. (Con Edison) has entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC) to investigate and if necessary remediate potential contamination at a number of former manufactured gas plant (MGP) properties. One of these properties is known as the West 42nd Street Former MGP Site (VCA Index No. D2-003-02-08), and is located between West 41st Street and West 42nd Street and 11th Avenue and 12th Avenue on the west side of Manhattan, New York. In accordance with the VCA, a Site Characterization Study (SCS) was completed in accordance with the Scope-of-Work presented in a NYSDEC-approved Site Characterization Study Work Plan, dated June 2003.

Site Location and Description

The former West 42nd Street MGP site is located in the Borough of Manhattan, New York City, New York. The former MGP site occupied approximately 5 acres, including all of modern-day Block 1089, the Hudson River water front property immediately west of Block 1089 (now designated as modern-day Block 1107), and the stretch of 12th Avenue currently separating Blocks 1089 and 1107. Block 1089 is further divided into Tax Lots 1 and 3. Tax Lot 1 currently consists of a high-rise apartment building, which occupies approximately 90 percent of the lot. The remaining portion of the lot consists of a landscaped, park-like area and sidewalks. Tax Lot 3 is currently used as a parking lot open to the public. Surface structures on Tax Lot 3 consist of a small wooden kiosk located in the central portion of the site to house the parking attendant.

The area in which the site is located maintains a high population density due to the presence of residential high-rises, office buildings, local attractions, and retail facilities as well as the influx of the workforce population on any given day of the workweek.

Site History

Historical records indicate that the land encompassing the former MGP site was originally part of the Hudson River and likely consisted of a shallow embayment, a tidal creek running through present day Block 1089, and associated tidal wetlands. By 1850, this portion of the Hudson River and associated wetlands appears to have been filled.

The construction of the Metropolitan Gas Light Company's West 42nd Street plant began in 1860. The plant operated as a coal gasification plant from 1863 into the early 1920s and was likely demolished in approximately 1925. In 1932 the New York Central Railroad Company acquired the former MGP site and constructed a railroad yard with several small associated buildings and a gasoline service station. By the 1980s, the former MGP site was utilized as a parking lot. In 1999-2000 a high-rise apartment building was erected on Tax Lot 1.

Site Hydrogeology

Based on the soil borings completed as part of this site investigation, as well as the documented historic filling that occurred at the former MGP site, the upper 15 to 28 feet of soil across the site consists of fill material containing significant quantities of anthropogenic materials such as brick, concrete, metal and wood timbers. All former MGP structures are located within this fill. Underlying the fill material is a clay unit consisting of a gray to black silty clay. The thickness of this clay unit is highly variable ranging from 2 to 18 feet in thickness. In areas where the clay unit is relatively thick, it appears to serve as an

effective confining unit, limiting the vertical migration of contaminants. Below the clay unit exists a sand and weathered bedrock unit up to 13 feet in thickness, which directly rests on unweathered bedrock of the Manhattan Schist Formation.

Groundwater information is limited to the eastern portion of the site within Tax Lot 3. Groundwater within Tax Lot 3 is not tidally influenced and is generally located 8 to 14 feet below grade. Based on available data, groundwater flows in a southerly direction within Tax Lot 3.

Investigation Objectives and Scope of Work

As stated in the Site Characterization Study Work Plan, dated June 2003, the primary objectives of the investigation included:

- Locate the subsurface remnants of MGP structures or other structures that might exist at the site and may be associated with waste source areas or serve as preferential pathways for the migration of MGP residuals or other contamination;
- Delineate the lateral and vertical extent of potential MGP residuals in the soil and groundwater at the site; and
- Characterize site-specific geology and hydrology.

The SCS field program included the following activities:

- Test pit excavation and sampling;
- Subsurface soil boring and sampling;
- Existing monitoring well sampling;
- Groundwater monitoring well installation and sampling;
- Perimeter air monitoring; and
- Surveying and mapping.

Investigation Findings

Tax Lot 1

A total of 11 subsurface soil borings were advanced on Tax Lot 1, and 22 soil samples were selected for chemical analysis. In general, MGP impacts were not observed in shallow subsurface soil of less than 4 feet in depth. The most significant MGP impacts, including the highest volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and metal concentrations were most prevalent in the Fill Unit below a depth of 10 feet, which places the majority of the impacted soil below the water table. However, at most locations, contaminant concentrations decrease rapidly below a depth of 24 feet. This rapid decrease in contaminant concentrations is likely due to the confining ability of the underlying Clay Unit. Exceptions to this general trend include borings SB-23 and SB-24 where NAPL/tar at saturated conditions was observed to a depth of up to 38 feet and within the Clay Unit. The Bedrock Unit within Tax Lot 1 was not observed to be impacted by MGP residuals.

Based on existing conditions and use of the site, exposure to MGP contaminants would not be expected for most on-site and off-site receptors. Currently, Tax Lot 1 contains a large apartment building and the remaining land is either paved or landscaped. An assessment of indoor and outdoor air quality at Tax Lot 1 concluded that air quality is not being impacted by MGP-related subsurface contamination present at the site.

The only potential for future exposure to MGP contamination at Tax Lot 1 is associated with utility/construction workers who may be involved with on-site excavations in support of the installation or repair of subsurface utilities within or in the vicinity of Tax Lot 1. However, health and safety measures will be implemented during these activities to prevent exposure to subsurface soil contaminants.

Based on the findings described above, additional field investigation is recommended within the vicinity of Tax Lot 1, including:

- A number of potential MGP contaminant source areas are possibly located west of Tax Lot 1, including two former oil tanks and eight former naphtha storage tanks. Therefore, soil borings are recommended in this area to further delineate the western portion of the former MGP across 12th Avenue. Furthermore, additional information is needed to define the nature and extent of MGP residuals identified at soil borings SB-24 and SB-23 that were completed along the eastern sidewalk of 12th Avenue. Therefore, additional soil borings are recommended in this area.
- Installation of shallow (water table) monitoring wells are recommended within the vicinity of Tax Lot 1 in order to determine the nature and extent of chemical constituents in groundwater, determine groundwater flow direction and provide information about possible impacts to the Hudson River. In addition, deep groundwater monitoring wells screened at or near the Bedrock Unit may be warranted to assess the extent of mobile tar/NAPL in the vicinity of 12th Avenue.

The above recommendations can be undertaken independent of the construction activities currently planned for Tax Lot 3. Therefore, the development of Tax Lot 3 will not be delayed by this additional field investigation.

Tax Lot 3

A total of 18 soil borings and 9 test pits were advanced within Tax Lot 3 with a total of 39 subsurface soil samples selected for chemical analysis. All of the subsurface soil samples selected for chemical analysis exhibited detectable levels of VOCs with the maximum total VOC concentration of 865 mg/kg observed in soil sample SB-29 (19-23 feet) collected along the eastern edge of the site, between the northeast and southeast former MGP gas holders. All of the subsurface soil samples selected for chemical analysis exhibited detectable levels of SVOC compounds with the maximum total SVOC concentration of 12,010 mg/kg observed in soil sample TP-02 (9-9.5 feet) collected within the former Purifying House foundation walls.

Evidence of tar/NAPL at saturated levels was not observed in subsurface soil within Tax Lot 3. The most significant MGP impacts were observed in the Fill Unit at depths ranging from 17 to 23 feet below ground surface (bgs), and within and adjacent to the former gas holders. Soil below and adjacent to the northwest and northeast former gas holders exhibited sheens and odors to a depth of up to 31 feet bgs. In addition, evidence of MGP impacts, including light to moderate odors, was observed below the southwest former gas holder up to a depth of 31 feet bgs. The southeast former gas holder exhibited the least amount of MGP impacts with only light to moderate staining and odors observed to 22 feet bgs.

Twenty-nine out of 39 subsurface soil samples selected for analysis exhibited detectable levels of total cyanide. The maximum total cyanide concentration of 1,580 mg/kg was detected in sample SB-17 (9-13 feet). Soil boring SB-17 was completed along the western portion of Tax Lot 3 within the vicinity of the former Purifying House.

In general, MGP impacts were not observed in shallow subsurface soil of less than 5 feet in depth throughout the majority of Tax Lot 3. In addition, the central portion of Tax Lot 3 surrounded by the four former gas holders exhibits little to no evidence of MGP impacts in subsurface soil throughout its vertical extent.

Four existing groundwater monitoring wells and six monitoring wells installed as part of the SCS field investigation were sampled in order to characterize site groundwater quality. Measurable separate-phase NAPL was not detected in any of the on-site monitoring wells.

The highest total VOC and total SVOC concentrations in on-site groundwater were detected in samples collected from monitoring LMW-03 and LMW-04. As discussed above, the sample collected from LMW-03 exhibited a slight sheen and appears to be located within the former NW gas holder. Similarly, LMW-04 appears to be located within the former SW gas holder and both wells are screened well below the water table immediately above the Bedrock Unit. As discussed above, the most significant soil impacts were observed to a depth of 23 feet, well above the Bedrock Unit. Therefore, it is possible that LMW-03 and LMW-04 are serving as vertical migration pathways for contaminants within and below the former gas holders. As a result, the high concentrations of VOCs and SVOCs detected in these wells may actually be associated with the MGP impacted soil that has been identified within and below the former gas holders and not representative of true groundwater quality above the Bedrock Unit. Furthermore, LMW-03 appears to be partially screened with the relatively permeable sand/weathered Bedrock Unit and there is the potential for contaminants entering this well screen to spread horizontally into this geologic unit. However, LMW-04 appears to be fully screened in the relatively impermeable Clay Unit and horizontal migration would not be expected at this well.

Methyl tertiary-butyl ether (MTBE), a common gasoline additive, was detected at concentrations that exceeded NYSDEC Class GA Groundwater Standards at monitoring well LMW-01 located directly downgradient of an Exxon/Mobil Service Station. Based on the review of NYSDEC records, there have been at least three petroleum spills that have occurred at this service station. In 2003, a subsurface investigation conducted at the service station on behalf of the ExxonMobil Refining and Supply Company identified up to 3 feet of free-phase petroleum in on-site monitoring wells, and an off-site BTEX groundwater plume migrating in a southerly direction towards Tax Lot 3. In addition, strong petroleum-like odors were detected emanating from the borehole during the completion of soil boring SB-15, also located downgradient of the service station. This information indicates that on-site groundwater, as well as soil vapor, is being impacted by a petroleum contaminant plume migrating from this Exxon/Mobil Service Station.

Currently, Tax Lot 3 is entirely paved and, therefore, direct exposure to MGP contaminants would not be expected under normal conditions. While groundwater contains MGP contaminants at concentrations in excess of NYSDEC Class GA Groundwater Standards, direct exposure to contaminated groundwater is not expected since groundwater is not used for potable or non-potable uses.

There are plans to construct an apartment building on Tax Lot 3 in the near future. As part of this construction, excavation of subsurface soil and groundwater containing MGP contaminants will be required. Therefore, appropriate health and safety measures will be implemented to prevent the exposure of on-site workers to contaminated subsurface soil and groundwater. In addition, windblown dust and soil vapors will be controlled during the excavation activities in order to eliminate the potential exposure of off-site receptors to MGP contaminants.

The design of the apartment complex includes the construction of a parking garage that will be located partially below the water table. Therefore, in order to prevent contaminated groundwater or

volatilized contaminants from seeping into this area, the design of the foundation includes the installation of a vapor control/waterproofing system.

Based on the findings described above, the following is recommended:

- Existing groundwater monitoring wells LMW-03 and LMW-04 should be abandoned in accordance with NYSDEC protocols by over-drilling the well casing and screen and sealing off the borehole annulus with a cement bentonite grout mixture prior to construction of the new building.
- In addition, although the remedial action has not yet been determined, the construction of the apartment building on Tax Lot 3 should include:
  - A health and safety plan designed to prevent exposure of construction workers and off-site receptors to contaminated material during construction of the new apartment building.
  - A soil management plan to ensure that, as part of the construction, all contaminated materials are characterized, handled, staged, transported and disposed in accordance with all relevant federal, state and local regulations.
  - A dewatering management plan to ensure all water generated during dewatering operations as part of the building construction is characterized, treated and discharged in accordance with all relevant federal, state and local regulations.
  - Support piles for the building will be installed using methods that will minimize the potential for downward migration of contamination.
  - Integrate a vapor control/waterproofing system into the construction of the new apartment building.

The development of Tax Lot 3 can be conducted independent of the recommended field investigations to be completed in the vicinity of Tax Lot 1.

1.0 INTRODUCTION

1.1 Site Characterization Study Objectives

The Consolidated Edison Company of New York, Inc. (Con Edison) has entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC) to investigate and if necessary remediate potential contamination at a number of former manufactured gas plant (MGP) properties. One of these properties is known as the West 42nd Street Former MGP Site (VCA Index No. D2-003-02-08, signed in August 2002), and is located between West 41st Street and West 42nd Street and 11th Avenue and 12th Avenue on the west side of Manhattan, New York. In accordance with the VCA, a work plan to investigate the site was prepared and approved by the NYSDEC. As stated in the Site Characterization Study Work Plan, dated June 2003, the primary objectives of the investigation included:

- Locate the subsurface remnants of MGP structures or other structures that might exist at the site and may be associated with waste source areas or serve as preferential pathways for the migration of MGP residuals or other contamination;
- Delineate the lateral and vertical extent of potential MGP residuals in the soil and groundwater at the site; and
- Characterize site-specific geology and hydrology.

As described in greater detail below, the West 42nd Street former MGP Site actually extended west of the current location of 12th Avenue. However, this SCS focused on that portion of the former MGP site located east of the 12th Avenue. Additional research has been done to evaluate the partial presence of former MGP structures or facilities to the west of the study area.

1.2 Overview of Report

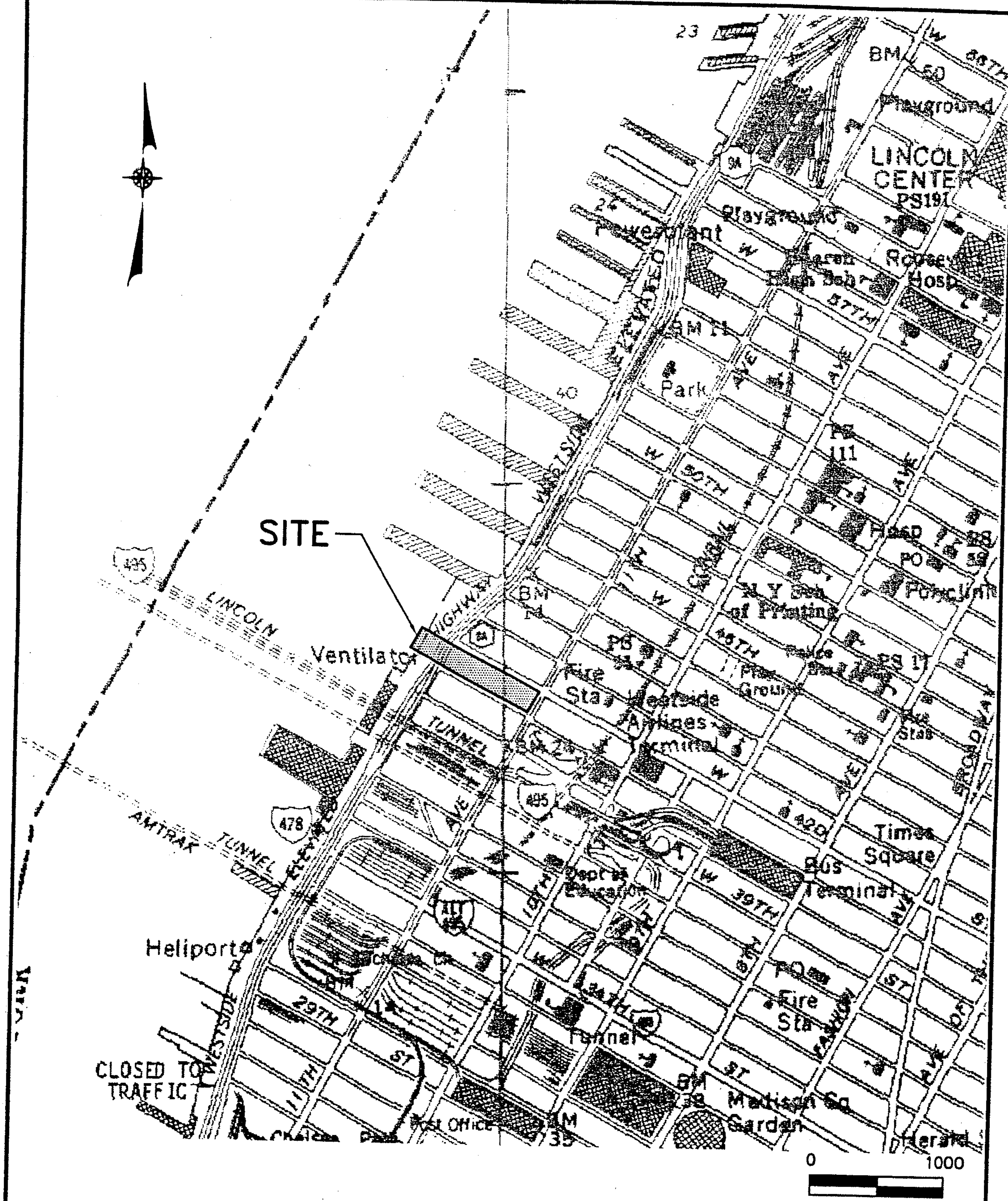
The Site Characterization Report is organized as follows:

- **Executive Summary:** Summarizes and provides an overview of the findings of the data collected as part of the field program completed in October 2003.
- **Section 1.0 - Introduction:** Presents background information and a description of the physical setting of the site and its surroundings. This section also provides the specific objectives of the field program. Section 1.0 summarizes information regarding site history as well as key findings of previous site investigations.
- **Section 2.0 - Site Characterization Activities:** Provides an overview of the field activities associated with the field program. Additionally, it discusses data management and chemical data validation/usability.
- **Section 3.0 - Site Geology and Hydrogeology:** Presents a discussion of the geology and hydrogeology of the site, based on geologic data collected as part of the field program. This section also takes into consideration geologic data obtained during previous site investigations described in Section 1.0.
- **Section 4.0 - Findings:** This section provides a discussion of the chemical compounds and other MGP residuals identified on-site, based on the data collected as part of the field program. Where appropriate, historical data has been used in conjunction with the field program data to provide a better understanding as to the nature and extent of MGP-related chemical compounds, and residuals associated with the site. Finally, this section also includes a qualitative human health exposure assessment.
- **Section 5.0 - Conclusions:** Provides conclusions based on the findings of **Section 4.0** in conjunction with the findings presented in **Section 3.0**.
- **Section 6.0 - References:** Lists all documents and other sources of information utilized in the preparation of this report.

1.3 Site Description and Area of Investigation

Site Description

The former West 42nd Street MGP site is located in the Borough of Manhattan, New York City, New York (see Figure 1-1). The former MGP site occupied approximately 5 acres. As



CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

SITE LOCATION MAP

FIGURE 1-1

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shown on Figure 1-2, the former MGP site included all of modern-day Block 1089, the Hudson River water front property immediately west of Block 1089 (now designated as modern-day Block 1107), and the stretch of 12th Avenue currently separating Blocks 1089 and 1107. The majority of the former MGP site located west of modern-day 12th Avenue is no longer in existence, including subsurface features, due to the fact that the majority of this portion of the former MGP was situated on a pier located on the Hudson River which is no longer in existence.

Area of Investigation

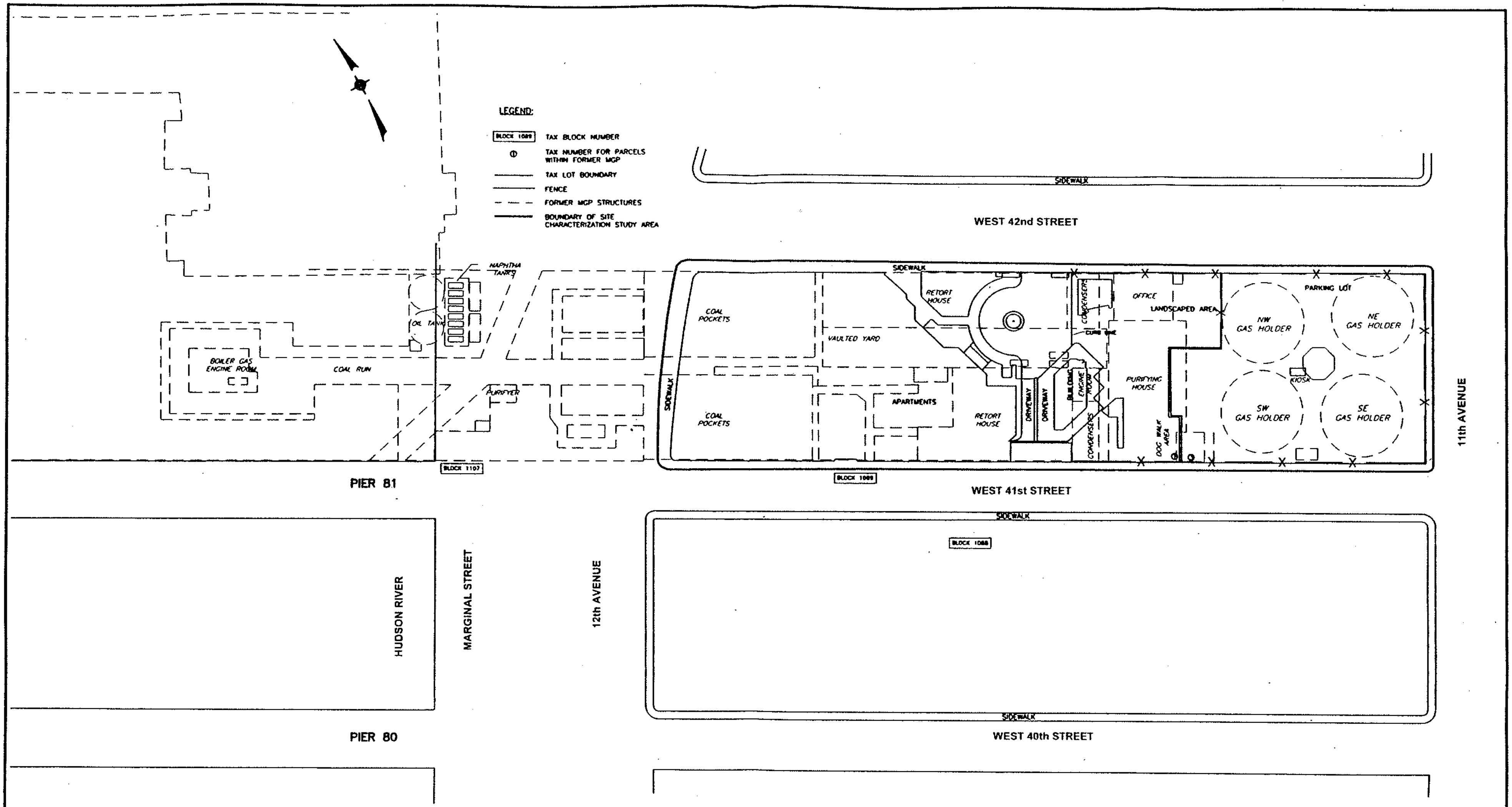
Based on the available historical information concerning the location of the former MGP, it was determined by Con Edison in consultation with the NYSDEC that this SCS would focus on that portion of the former MGP located west of 12th Avenue and within Block 1089. Figure 1-2 graphically depicts the study area of this SCS. Note that Block 1089 is further divided into Tax Lots 1 and 3, which are described below in greater detail.

Tax Lot 1 Description

Tax Lot 1 consists of a high-rise apartment building which occupies approximately 90 percent of the lot. The remaining portion of the lot consists of a landscaped, park-like area and sidewalks. Vacant retail space is located at the western base of the high rise, while the eastern base is occupied by a small café and flower shop. Additionally, an aboveground parking lot is located within the second floor of the high-rise apartment.

Tax Lot 3 Description

Surface structures on Tax Lot 3 consist of a small wooden kiosk located in the central portion of the site to house the parking attendant. The parking lot consists of concrete and asphalt pavement. Extensive asphalt patching has been used to repair cracks and/or areas of degraded concrete. Some areas of the parking lot appeared to gently undulate. At the time of the SCS completed in October 2003, Tax Lot 3 also contained a number of hydraulic car lifts used to



SOURCE: MAP PROVIDED BY CONSOLIDATED EDISON. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON INTERPRETATION OF SANBORN MAPS AND DRAWINGS PROVIDED BY CONSOLIDATED EDISON CONTAINED WITHIN THE WEST 42nd STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT BY PARSONS, DATED AUGUST 2002 AND THE RIVER PLACE PHASE II, 42nd STREET AND ELEVENTH AVENUE, GEOTECHNICAL ENGINEERING STUDY BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C., DATED JULY 2000

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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

SITE MAP

FIGURE 1-2

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vertically store automobiles and light trucks. The car lifts are located primarily within the eastern half of Tax Lot 3 and along the southern property boundary.

Adjoining Property Description

Properties in the vicinity of the site consist of commercial properties, restaurants, retail stores, and dockage on the Hudson River for private and commercial vessels. Commercial buildings are present to the east and south of the site along 11th Avenue and 41st Street. The World Yacht marina is located west of the site along the Hudson River with frontage along 12th Avenue. Storefront retail facilities are located to the north of the site with frontage along 42nd Street. A bus depot operated by the Metropolitan Transit Authority (MTA) is located south of 41st Street. At the time of SCS, the area buildings were observed to be generally well maintained and the roadways appeared to have been recently paved with few potholes. The area maintains a high population density due to the presence of residential high-rises, office buildings, local attractions, and retail facilities as well as the influx of the workforce population on any given day of the workweek.

Former MGP Layout and Operations

As discussed previously, the former MGP site was located on Blocks 1089 and 1107, as well as the portion of 12th Avenue currently separating the two blocks. Furthermore, a portion of the former MGP was located on a Hudson River pier connected to Block 1107. As shown on Figure 1-2, the former MGP facilities that were on Block 1089 consisted of two coal pockets, two retort houses, a vaulted yard, two condensers, an engine room, an office, a purifying house and four 250,000-cubic foot gas holding tanks. Each gas holder consisted of a cylindrical tank approximately 80 feet in diameter that extended below grade. The former MGP facilities included at the Block 1107 and 12th Avenue included oil tanks, naphtha tanks and a purifier. Located on the former Hudson River pier connected to Block 1107 was a boiler gas engine room and a coal run.

According to the Parsons Historic Report, a complete record of byproduct quantities, reuse, sale, and disposal is not available for the former MGP. However, raw materials for coal gas plants typically included gas coals, enriching coals, boiler fuel, gas oil, lime, and iron oxide. According to the Parsons Historic Report, all of the coal gas residuals, including coke, tar, ammoniacal liquor, and other carbon residuals were offered for sale.

Site History

The following discussion of site history and ownership is based on the information provided in the document entitled, "West 42nd Street Manufactured Gas Plant Site History Report," dated August 2002, prepared by Parsons under contract with Con Edison. Historical records indicate that the land encompassing the former MGP site was originally part of the Hudson River and likely consisted of a shallow embayment, a tidal creek running through present day Block 1089, and associated tidal wetlands. By 1850, this portion of the Hudson River and associated wetlands had been filled, but appeared to remain undeveloped until construction of the former MGP in 1860.

The construction of the Metropolitan Gas Light Company's West 42nd Street plant began in 1860. The plant operated as a coal gasification plant from 1863 into the early 1920s. Anthracite coal was delivered by barges or lighters to the company's Hudson River pier, and then carted to the plant. The coal was stored in two "coal houses" at the western end of Block 1089, then transported to one of two retort houses. The first retort house was constructed along West 42nd Street, and later a second was built and enlarged along West 41st Street. At the eastern end of each retort house were the gas condensers. After passing through the condensers, the gas was then conveyed to the purifying house, located east of the retort houses. The initial purifying house used the Dry-Lime Process, whereas the second purifying house (built to replace the first one after an explosion destroyed it in 1871) used the Laming Process. The Laming Process included the use of wood chips treated with iron oxide and stored in boxes. The iron oxide wood chips would aid in the removal of fine particles, cyanides, sulfides and CO_2 gas. The wood chips could be revived and reused unlike the lime materials. After the purifying house, the gas was pumped to four gas holders located at the eastern end of the block for storage before

being distributed to customers. Each of the gas holders was constructed of brick and had a capacity of 250,000 cubic feet. The former MGP operated through the early 1920s and was likely demolished in approximately 1925.

In 1932 the New York Central Railroad Company acquired the former MGP site and constructed a railroad yard with several small associated buildings and a gasoline service station. In 1940, the railroad yard complex and gasoline station were replaced by an "assorting station," office, and private garage belonging to the Railway Express Agency. The private garage included several underground storage tanks (USTs) that were used to store various petroleum products. The Railway Express Agency structures remained on the block for several decades. By the 1980s, the former MGP site was utilized as a parking lot. In 1999-2000 a high-rise apartment building was erected on Tax Lot 1. At the current time, Tax Lot 3 remains as a parking lot.

Site Ownership

According to the Parsons Historic Report, Charles Appleby sold all of Block 1089 and the portion of Block 1107 immediately west of Block 1089 to the Metropolitan Gas Light Company in 1860. Construction of the Metropolitan's West 42nd Street MGP began in late 1860 and continued into 1861. The MGP operated through the early 1920s. In 1923, the Consolidated Gas Company sold all of Block 1089 to the New York Edison Company, which was later acquired by Consolidated Gas. By 1925, the MGP was no longer in operation. In 1927, the New York Edison Company sold all of Block 1089 to the New York State Realty and Terminal Company, who in turn sold the block to the New York Central Railroad Company in 1932. Block 1089 had been owned by a series of railroad-affiliated entities through 1967. After 1967, the block passed to a series of real estate companies. Tax Lot 1 is owned by River Place I, LLC, which constructed the current high-rise apartment building. Tax Lot 3 is owned by River Place II, LLC, which has plans to construct an apartment building on this property in the near future.

1.4 Previous Site Investigations

This section provides an overview of previously completed environmental and geotechnical investigations completed at or in the immediate vicinity of the former West 42nd Street former MGP site.

Woodward-Clyde Associates, L.P., *Underground Storage Tank Closure Report*, July 1995, Prepared for Silverstein 42nd Associates, L.P.

The purpose of the closure report was to describe activities related to the closure of three separate UST systems consisting of 18 individual USTs located on Tax Lot 3. The UST systems were believed to be associated with petroleum storage for the Railway Express Agency motor vehicle fleet, and were located laterally, running north and south along the east side of Tax Lot 3. After removing the USTs, 20 post-excavation soil samples and two groundwater samples were collected from within the excavations and surrounding wells. Both soil and groundwater samples were analyzed for compounds listed in the August 1992 NYSDEC Spill Technology and Remediation Series (STARS) Memo #1: "Petroleum-Contaminated Soil Guidance Policy," Appendix B, Table 1.

Ten soil samples collected from the northeast corner of Tax Lot 3 exceeded the Toxicity Characteristic Leaching Procedure (TCLP) Alternative Guidance Values for gasoline-related compounds. Both groundwater samples contained gasoline-related compounds in excess of the NYSDEC Groundwater Quality Criteria, including benzene, n-butylbenzene, ethylbenzene, naphthalene and 1,2,4-trichlorobenzene. Based on the analytical results, Woodward-Clyde Associates, L.P. recommended additional site investigations to determine the extent of the petroleum contamination in the soil.

Woodward-Clyde Associates, L.P., *Results of Environmental Investigation Field Activities*, July 10, 1995, Prepared for Silverstein 42nd Associates, L.P.

This letter report summarized the results of an environmental investigation completed throughout Block 1089 (including both Tax Lot 1 and 3). Phase I of the investigation was

completed in February 1995, and consisted of advancing four soil borings and installing four groundwater monitoring wells. The purpose of the Phase I environmental investigation was to make a preliminary determination as to the degree to which the 18 gasoline tanks described in the previous investigation report may have impacted soil and groundwater at Tax Lot 3. Four soil samples were collected from each boring and analyzed for polyaromatic hydrocarbon (PAH) compounds listed in the August 1992 NYSDEC STARS Memo #1. Four groundwater samples were collected from installed monitoring wells, and were analyzed for volatile organic compounds (VOCs) and PAHs from the STARS Memo #1 compound list.

Following the preliminary results of the Phase I sampling, additional Phase II field work commenced on Tax Lot 3 to further evaluate the property with regard to its former use as a manufactured gas plant during the 1800s. Phase II field work was completed in May 1995 and consisted of advancing ten soil borings and installing four groundwater monitoring wells. Twenty-one grab soil samples were collected from the 10 borings at various depths and were analyzed for VOCs, base neutral compounds (BNCs) and Target Analyte List Metals (TAL metals). In addition, three composite soil samples were collected from 0-4 feet below grade for waste classification purposes and were analyzed for full TCLP. Groundwater samples were collected from both the Phase I and Phase II wells for a total of seven groundwater samples (one well was destroyed and therefore not sampled) and analyzed for VOCs, BNCs and TAL metals.

Analytical results of the Phase I and II soil and groundwater sampling indicated that subsurface soil beneath Block 1089 contains petroleum-related compounds (primarily PAHs) and metals in concentrations that exceed NYSDEC TAGM 4046 Soil Cleanup Objectives and STARS Memo Guidance Values. The TCLP data indicated that the shallow soil in Tax Lot 3 would likely be classified as non-hazardous for disposal purposes. Additionally, groundwater analytical results identified petroleum-related compounds (e.g., benzene, toluene, ethylbenzene, xylene [BTEX] and PAHs) and metals at concentrations that exceeded NYSDEC Ambient Water Quality Standards and Guidance Values and STARS Memo Guidance Values.

Woodward-Clyde Associates, L.P., *Results of Environmental Investigations and Plan for Additional Investigations*, September 19, 1995, Prepared for Silverstein 42nd Associates, L.P.

This letter was submitted to the NYSDEC by Woodward-Clyde Associates, L.P. and outlined a scope of work for the execution of a Phase III environmental investigation of Tax Lots 1 and 3. The objectives of this Phase III Study included the following:

- determine the contents of two former underground oil storage tanks;
- determine if polychlorinated biphenyls (PCBs) were present in the two former underground oil storage tanks;
- characterize the quality of the unsaturated soil in the area of the former gas holders on Tax Lot 3;
- analyze additional soil samples for TCLP on the east and west sides of Block 1089; and
- calculate the flux of groundwater beneath the site entering the Hudson River.

Woodward-Clyde Associates, L.P., *Phase III Environmental Sampling Results*, January 30, 1996, Prepared for Silverstein 42nd Associates, L.P.

As part of the Phase III investigation described above, 25 soil borings were advanced to collect soil samples for chemical analysis. Seventeen "near surface" soil samples (at or just below the ground surface) were analyzed for PCBs. Eighteen unsaturated soil samples were analyzed for coal gas waste, including VOCs, Base Neutral Compounds and inorganics. The five most contaminated unsaturated soil samples were also analyzed for the purposes of waste characterization, including TCLP, VOCs, SVOCs, herbicides, pesticides, metals and RCRA characteristics.

All PCB analyses were reported as non-detectable. The waste characterization analyses indicated that the unsaturated soil at Tax Logs 1 and 3 did not contain RCRA characteristic wastes. Therefore, soil remediation was not recommended by Woodward Clyde.

However, the report identified MGP-related contamination beneath the landscaped area on Tax Lot 1 over NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 soil cleanup guidelines. Furthermore, soil data from SB-35 and SB-52 identified soil impacts within the westernmost part of the site near 12th Avenue with total VOCs of 109.2 ppm and 93.2 ppm, respectively, and total semivolatile organic compounds (SVOCs) of 1,005.9 ppm and 2,951.5 ppm, respectively.

Woodward-Clyde Associates, L.P., *Results of 5/14/96 Groundwater Sampling and Completion of Project at Silverstein 42nd Associates, L.P.*, June 6, 1996, Prepared for Silverstein 42nd Associates, L.P.

The objective of this investigation was to determine if the elevated benzene concentrations associated with the tank removals at Tax Lot 1 had decreased over a 12-month period since the last sampling had occurred in May 1995. Two groundwater monitoring wells located along the eastern edge of Tax Lot 3 were sampled. The two samples were analyzed for the 14 gasoline-related VOCs as specified in the NYSDEC August 1992 STARS Memo #1. The groundwater sample, originally collected from MW-2 as part of the first sample round in May of 1995, exhibited elevated concentrations of benzene, ethylbenzene, naphthalene and xylene (BTEX). However, the second sample round collected from MW-02 in May of 1996 indicated that BTEX compounds had decreased to non-detectable levels at MW-02. The groundwater sample collected in May of 1996 from MW-04 located in the southwest corner of Tax Lot 1 exhibited concentrations of benzene and naphthalene that were similar to the May 1995 sampling event.

Woodward-Clyde Associates, L.P., *Fate and Transport Calculations to Determine Benzene Concentrations in Groundwater as it Enters the Hudson River*, June 21, 1996, Prepared for Silverstein 42nd Associates, L.P.

Pursuant to the request of the NYSDEC, a fate and transport analysis was performed to determine the potential impact of contaminated site groundwater on the Hudson River. An analytical multidimensional fate and transport model was used to model the potential impacts.

The assessment indicated that the groundwater from the site is likely not impacting the Hudson River.

Woodward-Clyde Associates, L.P., *Human Health and Environmental Risk Evaluation*, August 19, 1996, Prepared for Silverstein 42nd Associates, L.P.

A Human Health and Environmental Risk Evaluation was performed to evaluate the potential risk to human health, and the environment associated with site-related contaminants. The evaluation considered potential exposure to on-site contaminants, as well as potential transport of contaminants from the site to off-site receptors. Based on the findings of the evaluation, Woodward-Clyde Associates concluded that no significant exposures to site-related contamination were expected after redevelopment of Tax Lot 1. After redevelopment, the majority of the site was expected to be covered with building construction at grade. No significant exposures to groundwater contamination were expected due to the fact that groundwater was not used as a potable water supply, and was not expected to be used for this purpose in the future. No significant exposures to surface water (e.g., the Hudson River) were expected due to the removal of the USTs and fuel oil residuals from Tax Lots 1 and 3. No significant exposures through an air migration pathway were expected in the future given that construction of the apartment complex would include an effective cap/cover, which would eliminate the potential for dust generation.

Dames & Moore, *Phase I Environmental Site Assessment*, October 6, 1996, Prepared for the Bank of New York.

The objective of the Phase I was to identify potential environmental conditions associated with the activities at the site, which is necessary for the Bank of New York to finance the property. This report indicated that there was an identified environmental risk at the property due to the presence of contaminated soil and groundwater at the site. However, the soil had been determined through TCLP analysis to be nonhazardous. The report conclusions stated that any future disturbance, excavation or removal of soil from the site must be considered a nonhazardous industrial waste and a NYSDEC Part 364 permit must be obtained for transportation and disposal of excavated soil. In addition, the New York City Department of

Health would need to be involved in the project. The report further recommended the preparation of a Health and Safety Plan for on-site workers involved in foundation construction activities, as well as the establishment of health and safety guidelines associated with future property maintenance.

Consolidated Edison Company of New York, Inc.
Analytical Sample Results from the Vault Installation, 2000

In April of 2000, Con Edison collected soil samples from beneath the sidewalk on 41st Street, directly south of the former MGP site, in association with the construction of an electrical vault. The samples were collected due to the fact that petroleum impacted soil was encountered during the excavation activities. The two soil samples were analyzed for BTEX, TPH, PCBs and Fingerprint Oil ID analysis. The location of the two Con Edison samples are shown on Figure 1-4.

BTEX compounds were detected at the following concentrations: xylenes - 485,000 ppb, benzene - 7,490 ppb, toluene - 5,750 ppb and ethylbenzene - 168,000 ppb. The Fingerprint Oil ID analysis indicated the presence of a substance similar to a mixture of gasoline and a light fuel oil. Additionally, TPH concentrations were detected up to 3,040 ppm; however, PCBs were not detected. On April 13, 2000, Con Edison notified the NYSDEC of the sample results and the case was assigned NYSDEC Spill Number 0000506. The spill was closed on April 25, 2000. During the vault installation on May 25, 2000, one soil sample was collected by Con Edison and analyzed for TCLP VOCs, SVOCs and metals. Only benzene was detected in the VOC analysis at a concentration of 0.016 ppm. No SVOCs were detected; however, barium, lead and selenium were detected in the metals analysis at concentrations of 0.58 ppm, 0.068 ppm and 0.046 ppm, respectively.

Langan Engineering & Environmental Services, P.C.,
Geotechnical Engineering Study for River Place Phase II;
July 2000, Prepared for Silverstein Properties

The objective of this study was to investigate the subsurface conditions at Tax Lot 3 and to develop recommendations related to foundation design and building construction associated

with the development of the property. Fifty-two soil borings and three wells were advanced throughout Tax Lot 3 and along the adjacent sidewalks (see Figure 1-3). On-site borings were advanced to depths ranging between 38 to 65 feet below grade. The off-site borings (referred to as "probes") were advanced to 30 feet below grade at the perimeter of Tax Lot 3. The wells were installed within the northeast, northwest and southwest corners of Tax Lot 3.

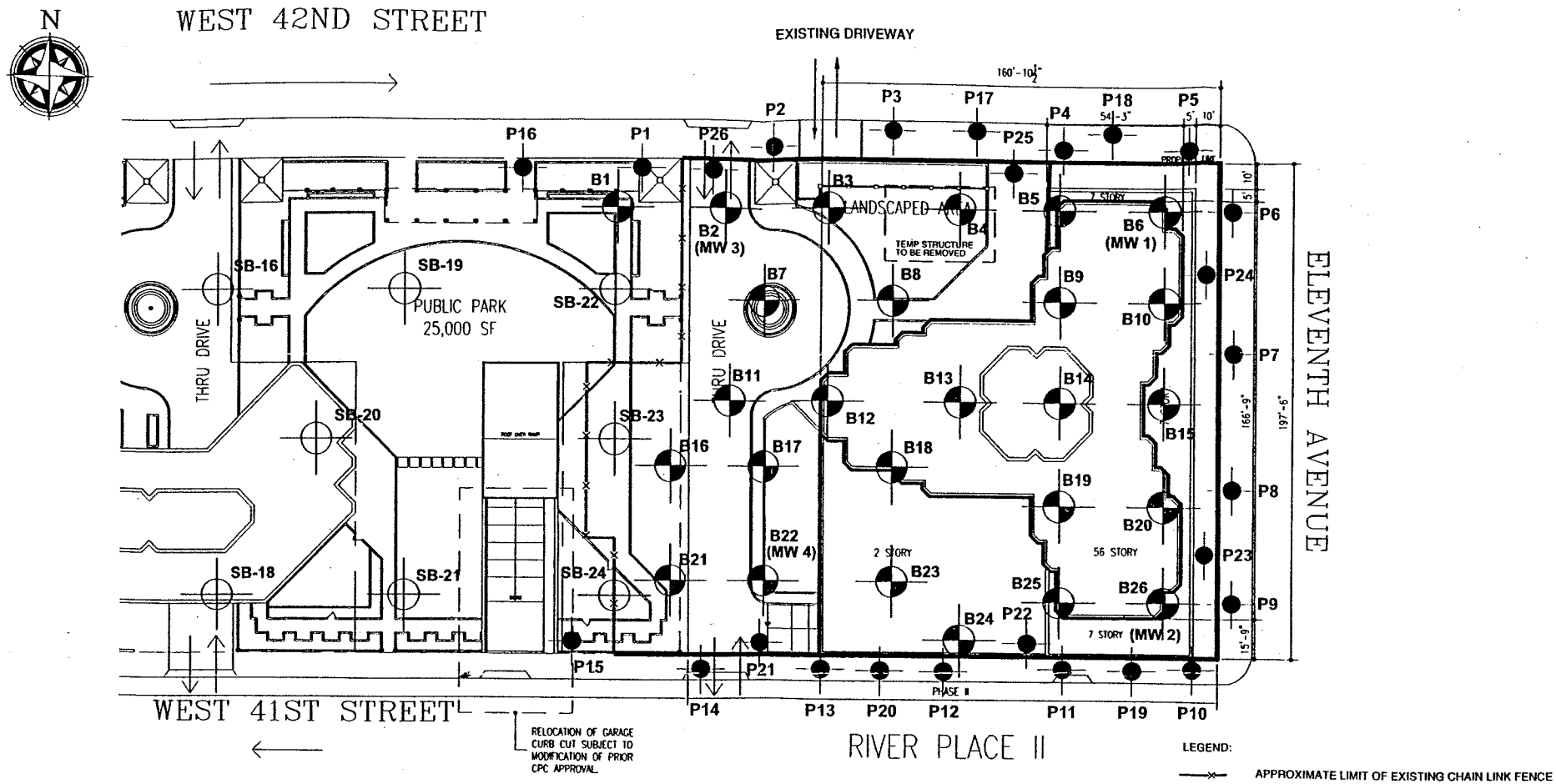
Seventeen soil samples from fourteen boring locations from varying depths were selected for analysis, including VOCs, SVOCs and TCLP. The three newly installed wells and one existing well (located at the southeast corner of Tax Lot 3) were sampled and analyzed for PCBs, metals, BTEX, TPH, cyanide, total suspended solids, oil and grease, pH, ignitablity, amenable cyanide and chromium VI.

Based on the findings of this study, site soil exhibited petroleum-like odors and intermittent soil staining. The majority of borings that exhibited these characteristics were located along the northeastern corner of Tax Lot 3 and impacted soil was primarily observed at depths ranging from 5 to 27 feet below grade. Creosol odors in recovered soil samples were also noted at boring locations B17, B19 and B25 between 20 and 22 feet below grade.

Figure 1-4 graphically displays the total VOC, total SVOC, total BTEX, TPH and total cyanide data for each sample collected as part of the geotechnical investigation. Total VOC concentrations of between 1.8 and 716 ppm were detected at boring locations B5, B14 and B25 in the central portion of Tax Lot 3. Total SVOC concentrations of between 68.2 and 1,748 ppm were also detected at boring locations B5, B14 and B25. In addition, total SVOC concentrations between 93.52 and 67.81 ppm were detected at boring locations B6 and B26 in the central, and along the eastern portions of Tax Lot 3. The groundwater samples collected from the four wells exhibited concentrations of BTEX and metals above NYSDEC groundwater standards.

Parsons, *West 42nd Street Manufactured Gas Plant Site History Report*, August 2002, Prepared for Consolidated Edison Company of New York, Inc.

Parsons was retained by Con Edison to conduct a review of all historical documents concerning the West 42nd Street former MGP site. In fact, the discussion of the history and



SOURCE: LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C.

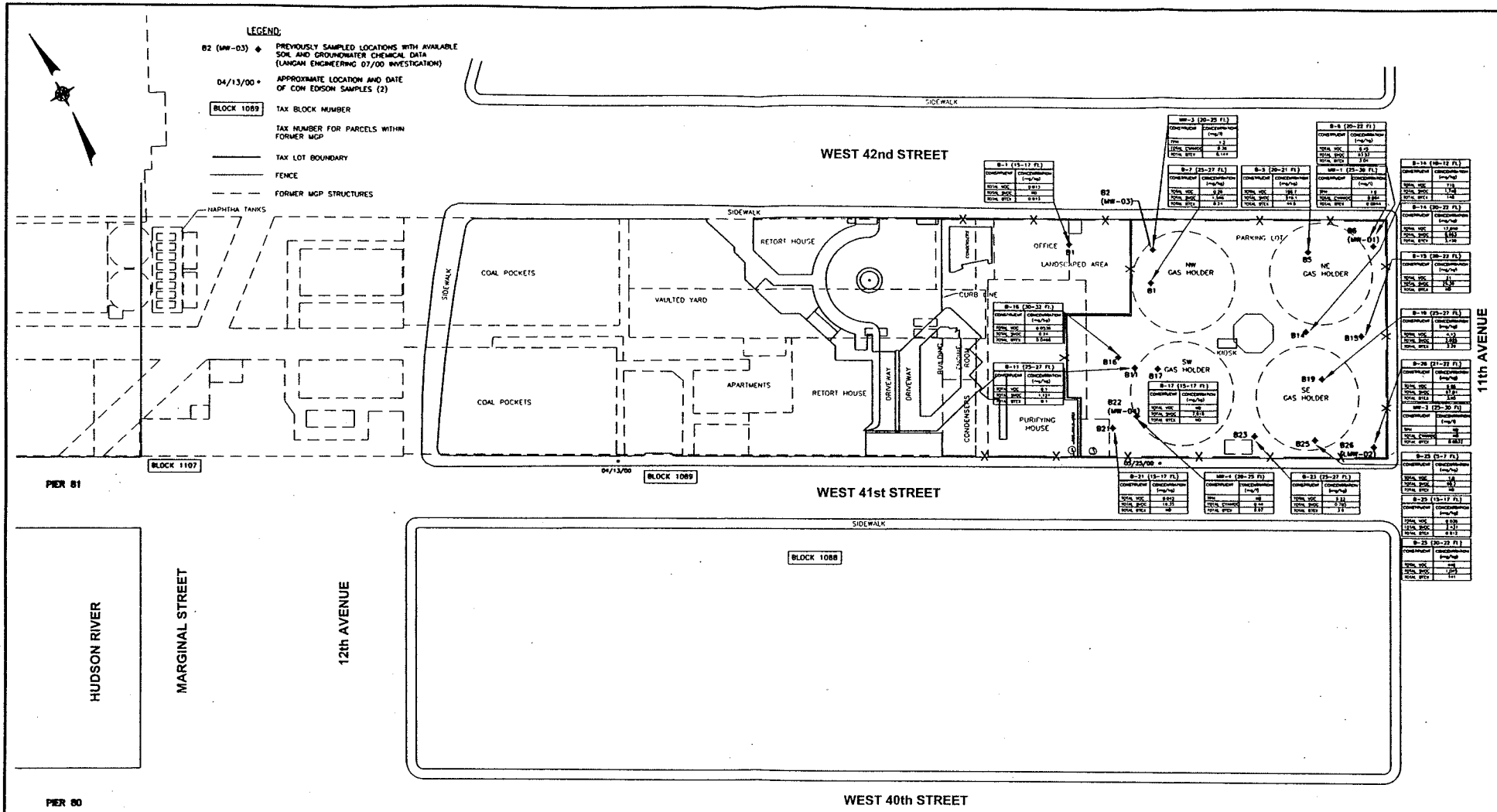
RLA/DWG/CONED2005(11/17/03)

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
GEOTECHNICAL ENGINEERING STUDY - RIVER PLACE, PHASE II
JULY 25, 2000

BORING LOCATION PLAN

FIGURE 1-3



SOURCE: MAP PROVIDED BY CONSOLIDATED EDISON. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON INTERPRETATION OF SANBORN MAPS AND DRAWINGS PROVIDED BY CONSOLIDATED EDISON CONTAINED WITHIN THE WEST 42nd STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT BY PARSONS, DATED AUGUST 2002 AND THE RIVER PLACE PHASE II, 42nd. STREET AND ELEVENTH AVENUE, GEOTECHNICAL ENGINEERING STUDY BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C., DATED JULY 2000.

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SCALE IN FEET

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

LANGAN ENGINEERING ANALYTICAL DATA SUMMARY MAP

FIGURE 1-4

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ownership of the site provided in Section 1.3 of this SCS report is based on the findings of the Parsons report. As part of that assignment, Parsons acquired a database of all state and federal environmental records for the former MGP and surrounding properties. Based on a review of the environmental database provided in the report, there were a total of three recorded petroleum spills associated with the Mobil Station at 561 11th Avenue, New York, New York, located directly north of Tax Lot 3. The spill numbers associated with this adjacent property includes:

- 9009655, spill date 12/05/90, product spilled: gasoline
- 9900078, spill date 4/02/99, product spilled: gasoline
- 9905507, spill date 8/06/99, product spilled: gasoline

The database identified an additional petroleum spill associated with the New York City Transit bus depot located on the corner of West 41st Street and 11th Avenue, directly south of Tax Lots 1 and 3 (8904384, spill date of 8/02/89). Details regarding the type of petroleum spilled or any additional information concerning closure or cleanup of this spill were not provided in the database.

Additionally, the Parsons Historic Report identified an investigation entitled, "May 1994 Final Impact Statement for Route 9a Reconstruction Project." The purpose of this environmental impact statement was to identify the existing environmental conditions from 29th Street to 46th Street along 12th Avenue. During the first phase of sampling (1A), subsurface soil samples were collected from eight borings and soil-gas survey samples were collected from two boring locations, all located between 42nd and 44th Streets. Groundwater samples were also collected from three monitoring wells located at 38th, 39th and 43rd Streets and 12th Avenue. Soil samples were analyzed for VOCs, BTEX, metals and PAHs. The soil-gas survey samples were analyzed for VOCs, while the groundwater samples were analyzed for BTEX, metals and PAHs.

The soil sample analysis indicated the presence of PAHs throughout the area investigated, particularly in samples collected from 41st Street to 46th Street. A sample collected between 41st and 42nd Streets from 40 feet below grade contained BTEX at a concentration of 13 parts per million (ppm). The groundwater analysis detected PAHs in samples

collected from 39th and 43rd Streets; however, it should be noted that the groundwater samples reportedly had turbidity readings of over 1,000 nephelometric turbidity units (NTUs), which indicates the samples were of poor quality. The groundwater sample from 39th Street also contained low levels of BTEX. The collected soil-gas survey samples did not detect any VOCs; however, methane was detected at a concentration of greater than 10,000 ppm in one boring located between 43rd and 44th Streets.

A second phase of sampling was conducted as part of this environmental impact statement due to the presence of the identified VOCs, in the deep subsurface soil and groundwater between 40th and 41st Street along 12th Avenue. To better define the southern extent of the contamination, an additional groundwater monitoring well was installed between 39th and 40th Streets along 12th Avenue. Four soil samples (from 2 to 32 feet below grade) and one groundwater sample was collected from this location and analyzed for VOCs, SVOCs, metals, cyanide, total petroleum hydrocarbons (TPH) and TCLP parameters. Additionally groundwater samples were collected from the three existing wells and analyzed for metals.

Under this second phase, no VOCs were detected in any of the soil samples. PAHs were detected in the 2- to 6-foot and 8- to 10-foot soil samples with total PAH concentrations of up to 10 ppm. PAHs were not detected in the deeper samples. Additionally, TPH and metals were detected at fairly low levels in all four samples with all TPH values being less than 100 ppm.

The only organic compounds detected in the groundwater sample collected from the newly installed well was xylene at 3 ppb and bis(2-Ethylhexyl)phthalate at 34 ppb. However, these two compounds were also detected in the method blank and, therefore, most likely associated with laboratory contamination. PAHs or TPH were not detected in the sample.

Metals analysis was performed on groundwater samples collected from four wells: a newly installed well and three existing wells. The report indicated that several metals were detected at levels above NYSDEC Class GA groundwater standards in the unfiltered samples. However, no specific details were provided in the report as to the specific metals detected in the samples.

Roux Associates, Inc., *Subsurface Investigation and Quarterly Monitoring Report*, August 27, 2003, Prepared for the ExxonMobil Refining and Supply Company

Roux Associates, Inc. prepared a Subsurface Investigation and Quarterly Monitoring Report, which documents data associated with a environmental monitoring program conducted from May 2003 through July 2003 on behalf of the ExxonMobil Refining & Supply Company (ExxonMobil). As discussed previously, a Mobil Service Station is located directly north of Tax Lot 3, across 42nd Street, and there are at least three NYSDEC-documented petroleum spills associated with the site. The investigation activities performed as part of this program included on-site and off-site subsurface investigations with Geoprobe equipment, installation of four monitoring wells, monthly liquid level gauging, and quarterly groundwater sampling and laboratory analysis.

The Roux report identified significant petroleum contamination within and downgradient of the Mobil Service Station. Free-phase hydrocarbon was identified within the Mobil Station site with up to 3 feet of product measured at Roux's MW-3, located 50 feet to the north of Tax Lot 3. However, the majority of the contamination appears to be located in the northeast corner of the Mobil station site. Based on the Roux investigation, groundwater flows in a southerly direction, making the Mobil station site directly upgradient of Tax Lot 3.

The groundwater data documents a BTEX groundwater plume migrating off the Mobil Station site to the south. Based on the available data, the BTEX plume has likely impacted Tax Lot 3. Total BTEX concentrations of up to 14.1 ppm were detected in groundwater samples collected from sample points located on the southern sidewalk of 42nd Street, adjacent to Tax Lot 3.

2.0 SITE CHARACTERIZATION ACTIVITIES

2.1 Introduction

This section provides an overview of the field activities associated with the Site Characterization Study (SCS) of the West 42nd Street former MGP site. The field investigation program was completed in accordance with the NYSDEC-approved Site Characterization Work Plan, dated June 2003. However, the work plan was modified and expanded in a number of areas as the program progressed in order to address unforeseen field conditions. All deviations from the work plan were approved by Con Edison and NYSDEC prior to implementation and were documented by the D&B Field Operations Manager.

This section identifies all the modifications and increases to the original scope of work as presented in the work plan. In addition, this section provides information on data management and chemical data validation and usability. Table 2-1 provides a summary of all soil borings, test pits and monitoring wells completed as part of the SCS field program. Table 2-2 summarizes the laboratory methods used to analyze each type of environmental sample selected for chemical analysis. All sample locations are shown on Figure 2-1.

2.2 Test Pits

As shown on Figure 2-1, nine test pits were completed within Tax Lot 3 in order to identify the presence of any remaining former MGP subsurface structures as well as the presence of tar or non-aqueous phase liquid (NAPL) within this portion of the former MGP site. The original work plan included the completion of two test pits within the landscaped area of Tax Lot 1. However, the two test pits (TP-10 and TP-11) were eliminated from the scope of work due to the disruption that would have resulted to the landscaped area. The information relating to the Purifying House structure was obtained from TP-02, SB-08, SB-18, SB-19 and SB-28. The NYSDEC concurred with this change to the work plan.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location Designation	Task Description	Depth (Feet)	Date		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan
			Start	Completion		Sample Depth(s) (Feet)	Sample Analysis	
TEST PIT EXCAVATIONS								
TP-01	Test Pit Excavation & Subsurface Soil Sampling	8	08/14/2003	08/14/2003	KP	5-5.5	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-01 was moved approx. 5' east to remain within the parking lot area. Test pit was increased in size by 60 square feet.
TP-02	Test Pit Excavation & Subsurface Soil Sampling	10	08/12/2003	08/13/2003	KP	9-9.5	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-02 was increased in size by 274 square feet.
TP-03	Test Pit Excavation & Subsurface Soil Sampling	10.5	08/19/2003	08/19/2003	KP	3.5-4	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-03 was moved approx. 12' northeast to avoid undermining the kiosk. Test pit was increased in size by 266.5 square feet.
TP-04	Test Pit Excavation & Subsurface Soil Sampling	9.25	08/13/2003	08/18/2003	KP	8-8.5	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-04 was increased in size by 185 square feet.
TP-05	Test Pit Excavation & Subsurface Soil Sampling	11.5	08/20/2003	08/20/2003	KP	11-11.5	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-05 was moved approx. 3' north and 20' east to move away from the south site boundary wall and hydraulic car lift lines. Test pit was increased in size by 140 square feet.
TP-06	Test Pit Excavation & Subsurface Soil Sampling	10	08/22/2003	08/22/2003	KP	9.5-10	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-06 was moved approx. 20' south and 12.5' east because TP-07 revealed the northwestern portion of the southeast gas holder and the originally proposed test pit location would not have uncovered a holder wall. Test pit was increased in size by 80 square feet.
TP-07	Test Pit Excavation & Subsurface Soil Sampling	10.5	08/19/2003	08/19/2003	KP	10-10.5	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-07 was moved approx. 4' south to avoid undermining the integrity of the telephone pole. Test pit was increased in size by 252 square feet.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location Designation	Task Description	Depth (Feet)	Date		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan?
			Start	Completion		Sample Depth (s) (Feet)	Sample Analysis	
TEST PIT EXCAVATIONS (continued)								
TP-08	Test Pit Excavation & Subsurface Soil Sampling	11	08/21/2003	08/21/2003	KP	10.5-11	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-08 was increased in size by 164 square feet.
TP-09	Test Pit Excavation & Subsurface Soil Sampling	10.5	08/19/2003	08/19/2003	KP	10-10.5	VOCs, SVOCs, TAL Metals and Total Cyanide	TP-09 was moved approx. 2' west to avoid undermining the hydraulic car lifts. Test pit was increased in size by 164.5 square feet.
SOIL BORINGS								
SB-01	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	32	09/02/2003	09/02/2003	KP	22-26, 26-32	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-01 was completed in accordance with work plan.
SB-02	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	19	09/03/2003	09/22/2003	KP	17-19, 29-31	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-02 was completed in accordance with work plan.
SB-03	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	19	09/04/2003	09/05/2003	KP	17-19	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-03 was terminated at 19' bgs to avoid drilling through holder bottom and was not advanced to bedrock as per the work plan. A new boring was advanced downgradient and outside the holder (within the landscaped area) and was designated SB-28.
SB-04	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	32.9	09/18/2003	09/18/2003	KP	10-16	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-04 was moved to within TP-02 to have equally distant sample locations along the Purifying House eastern wall.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location Designation	Task/Description	Depth (Feet)	Date		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan
			Start	Completion		Sample Depth(s) (Feet)	Sample Analysis	
SOIL BORINGS (continued)								
SB-05	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	19.5	09/09/2003	09/09/2003	KP	18-19.5	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-5 was moved to within TP-3 to avoid the kiosk.
SB-06	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	33	09/09/2003	09/09/2003	KP	9-11	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-06 was completed in accordance with work plan.
SB-07	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	39.5	09/03/2003	09/04/2003	KP	27-29, 33-35	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-07 was completed in accordance with work plan.
SB-08	Geoprobe Soil Boring & Subsurface Soil Sampling	30	10/02/2003	10/02/2003	KP	12-16, 28-30	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-8 was moved 8' west to the southern tip of the walking path in the landscaped area.
SB-09	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	33.5	09/05/2003	09/05/2003	KP	11-15, 31-33.5	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-09 was completed in accordance with work plan.
SB-10	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	42	09/11/2003	09/11/2003	KP	20-24, 26-28	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-10 was moved approx. 15' northeast to within TP-5 to avoid car lifts and hydraulic lines.
SB-11	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	29	09/10/2003	09/17/2003	KP	10-12	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-11 was relocated to the south because refusal was encountered three times at original sampling location.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location Designation	Task Description	Depth (feet)	Date		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan
			Start	Completion		Sample Depth (s) (Feet)	Sample Analysis	
SOIL BORINGS (continued)								
SB-12	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	28.8	09/08/2003	09/08/2003	KP	21-23, 27-28.8	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-12 was completed in accordance with work plan.
SB-13	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	21.4	09/16/2003	09/16/2003	KP	19-21.4	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-13 was moved 2' east to avoid car lifts and hydraulic lines.
SB-14	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	56	09/12/2003	09/15/2003	KP	17-19, 30-32	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-14 was completed in accordance with work plan.
SB-15	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	19	09/12/2003	09/12/2003	KP	7-9, 13-15	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-15 was terminated at 19' bg to avoid drilling through the gas holder bottom and was not advanced to bedrock as per the work plan. A new boring was advanced within the gas holder and was designated SB-27. SB-12 is designated as the downgradient boring of the NE gas holder as per the work plan.
SB-16	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	49	09/16/2003	09/16/2003	KP	19-21.4, 25-27	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-16 was completed in accordance with work plan.
SB-17	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	33	09/09/2003	09/10/2003	KP	9-13, 21-23	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-17 was moved 2' west in order to get closer to the fence and obtain soil classification data for the landscaped area.
SB-18	Geoprobe Soil Boring & Subsurface Soil Sampling	31	09/26/2003	09/26/2003	KP	9-13, 23-25	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-18 was completed in accordance with work plan.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location Designation	Task/Description	Depth (Feet)	Date		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan
			Start	Completion		Sample Depth (s) (Feet)	Sample Analysis	
SOIL BORINGS (continued)								
SB-19	Geoprobe Soil Boring & Subsurface Soil Sampling	26.2	10/02/2003	10/02/2003	KP	20-24, 24-26.2	VOCs, SVOCs; TAL Metals and Total Cyanide	SB-19 was moved 25' north and 25'west to the northern tip of the walking path in the landscaped area.
SB-20	Geoprobe Soil Boring & Subsurface Soil Sampling	32	10/02/2003	10/02/2003	KP	12-16, 16-20	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-20 was completed in accordance with work plan.
SB-21	Geoprobe Soil Boring & Subsurface Soil Sampling	38.9	09/30/2003	09/30/2003	KP	12-16, 36-38.9	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-21 was completed in accordance with work plan.
SB-22	Geoprobe Soil Boring & Subsurface Soil Sampling	49	09/29/2003	09/29/2003	KP	12-16, 36-44	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-22 was relocated to within the loading dock area in River Place I, through consultation with Con Edison, NYSDEC and the property owner. The revised location may provide a better understanding of soil characteristics under the apartment building.
SB-23	Geoprobe Soil Boring & Subsurface Soil Sampling	54.5	09/30/2003	09/30/2003	KP	20-24', 52-54.4'	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-23 was completed in accordance with work plan.
SB-24	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	38	09/30/2003	10/03/2003	KP	30-32, 34-36, 36-38	VOCs, SVOCs, TAL Metals and Total Cyanide, Environmental Forensic Analysis on 36-38 interval	SB-24 was not advanced to bedrock. Due to the amount of mobile DNAPL/tar encountered, there was a concern that advancing the boring further into the underlying clay confining unit which may potentially create a pathway for vertical migration.
SB-25	Geoprobe Soil Boring & Subsurface Soil Sampling	38	10/01/2003	10/01/2003	KP	12-16, 24-28	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-25 was completed in accordance with work plan.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location Designation	Task Description	Depth (Feet)	Date		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan
			Start	Completion		Sample Depth (s) (Feet)	Sample Analysis	
SOIL BORINGS (continued)								
SB-26	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	28.5	09/29/2003	10/06/2003	KP	9-13, 16-19	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-26 was moved 4' to the north to within the sidewalk after refusal was hit at 19'.
SB-27	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	42	09/22/2003	09/23/2003	KP	18-20, 29-31	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-27 was added to the program to provide a better understanding of soil characteristics within and below the northeast gas holder.
SB-28	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	28.5	09/25/2003	09/25/2003	KP	11-13	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-28 was added to the program to provide additional soil characteristic information from within the landscaped area.
SB-29	Hollow Stem Auger Soil Boring & Subsurface Soil Sampling	52	09/24/2003	09/25/2003	KP	19-23, 39-41	VOCs, SVOCs, TAL Metals and Total Cyanide	SB-29 was added to the program to provide additional soil classification information between the northeast and southeast gas holders and additional information downgradient of contamination observed within boring SB-16.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location Designation	Task Description	Depth (Feet)	Dates		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan
			Start	Completion		Sample Depth (s) (Feet)	Sample Analysis	
GROUNDWATER MONITORING WELLS								
MW-01	Groundwater Monitoring Well Installation and Groundwater Sampling	19	09/25/2003	09/25/2003	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was moved 25' south and 22' west to be outside and downgradient of the northwest gas holder.
MW-02	Groundwater Monitoring Well Installation and Groundwater Sampling	19	09/09/2003	09/09/2003	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was completed in accordance with work plan.
MW-03	Groundwater Monitoring Well Installation and Groundwater Sampling	19	09/08/2003	09/08/2003	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was completed in accordance with work plan.
MW-04	Groundwater Monitoring Well Installation and Groundwater Sampling	19	09/10/2003	09/10/2003	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was completed in accordance with work plan.
MW-05	Groundwater Monitoring Well Installation and Groundwater Sampling	19	09/24/2003	09/24/2003	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was moved 8' north and 12' east to be outside the southeast gas holder and within SB-10 boring location.
MW-06	Groundwater Monitoring Well Installation and Groundwater Sampling	19	09/17/2003	09/17/2003	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was completed in accordance with work plan.

TABLE 2-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
SUMMARY OF FIELD INVESTIGATION PROGRAM

Sample Location & Designation	Task/Description	Depth (Feet)	Date		Lead Geologist	Samples Selected for Analysis		Significant Deviations from Work Plan
			Start	Completion		Sample Depth (s) (Feet)	Sample Analysis	
EXISTING GROUNDWATER MONITORING WELLS								
LMW-01	Sampling Groundwater Monitoring Well Installed during the July 2000 Geotechnical Engineering Study	39.95	10/09/2003 (Development Only)	10/09/2003 (Development Only)	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was sampled in accordance with the (modified) work plan.
LMW-02	Sampling Groundwater Monitoring Well Installed during the July 2000 Geotechnical Engineering Study	27.81	10/09/2003 (Development Only)	10/09/2003 (Development Only)	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was sampled in accordance with the (modified) work plan.
LMW-03	Sampling Groundwater Monitoring Well Installed during the July 2000 Geotechnical Engineering Study	29.27	10/08/2003 (Development Only)	10/08/2003 (Development Only)	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was sampled in accordance with the (modified) work plan.
LMW-04	Sampling Groundwater Monitoring Well Installed during the July 2000 Geotechnical Engineering Study	31.4	10/08/2003 (Development Only)	10/08/2003 (Development Only)	KP	--	VOCs, SVOCs, TAL Metals, Total Cyanide and Amenable Cyanide	Well was sampled in accordance with the (modified) work plan.

NOTES:
-- : Not Available VOCs : Volatile Organic Contaminants SVOCs : Semivolatile Organic Contaminants TAL Metals : Target Analyte List Metals
N/A : Not Applicable

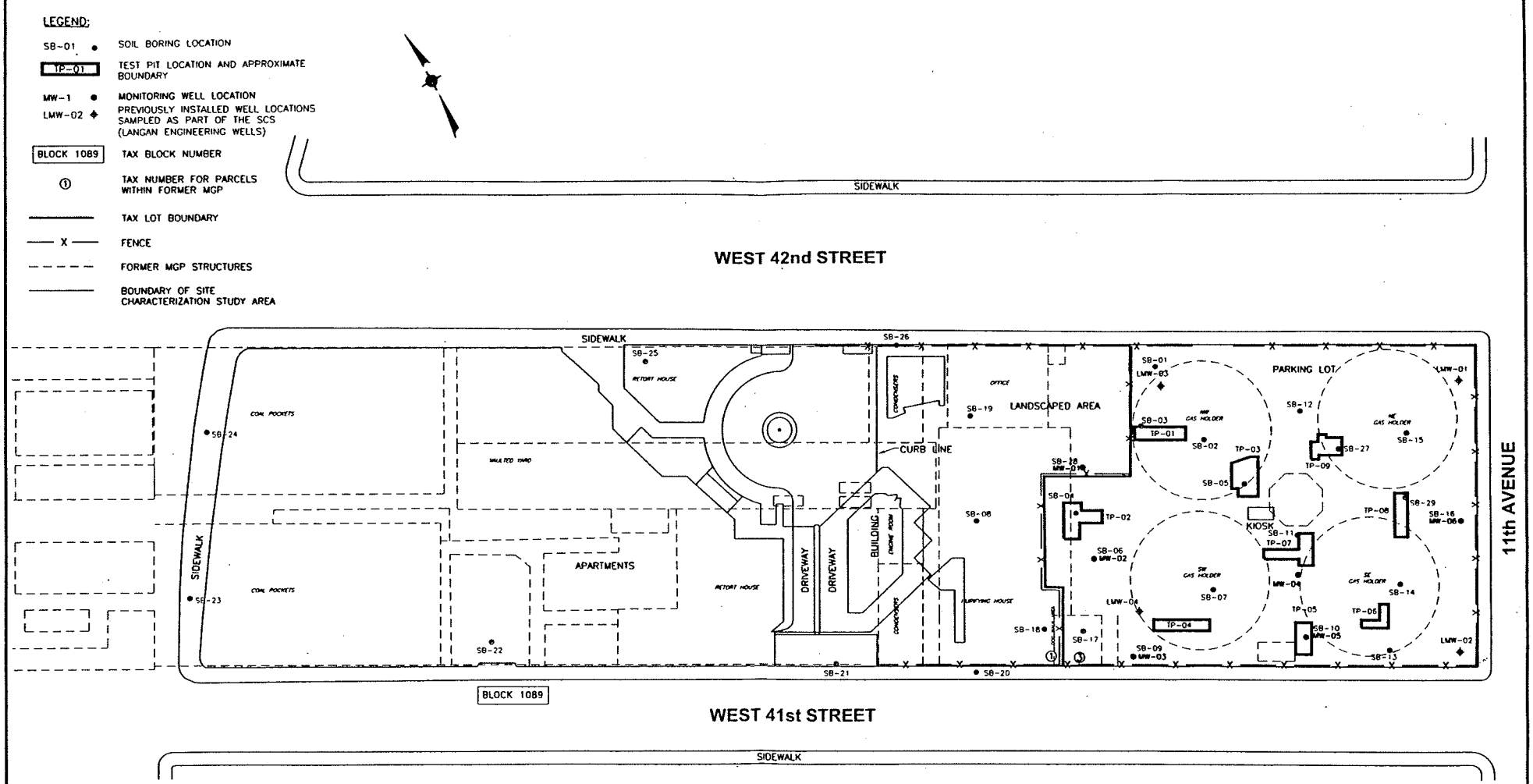
TABLE 2-2
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION REPORT
SAMPLE MEDIA, CHEMICAL CONSTITUENTS AND ANALYTICAL METHODS

SAMPLE MEDIA AND ANALYTICAL METHOD		
Chemical Constituents	**Soil**	**Groundwater**
VOCs	USEPA Method 8260	USEPA Method 8260
SVOCs	USEPA Method 8270	USEPA Method 8270
TAL Metals	USEPA Methods 6000/7000	USEPA Methods 6000/7000
Total Cyanide	USEPA Method 9012	USEPA Method 9012
Amenable Cyanide	--	USEPA Method OIA-1677
Forensic Hydrocarbon Fingerprint	USEPA Modified Method 8100	--

Note:

-- : Not sampled/analyzed.



SOURCE: MAP PROVIDED BY CONSOLIDATED EDISON. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON INTERPRETATION OF SANBORN MAPS AND DRAWINGS PROVIDED BY CONSOLIDATED EDISON CONTAINED WITHIN THE WEST 42nd STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT BY PARSONS, DATED AUGUST 2002 AND THE RIVER PLACE PHASE II, 42nd. STREET AND ELEVENTH AVENUE, GEOTECHNICAL ENGINEERING STUDY BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C., DATED JULY 2000

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

SAMPLE LOCATION MAP

FIGURE 2-1

F:\2085\2085-dg, 04/30/04 10:05:52 AM, DCortes

The test pits were completed using a tire-mounted backhoe. Each test pit was excavated to the groundwater interface or to the maximum depth to which the backhoe was able to safely excavate (approximately 11 feet), whichever was encountered first. Generally, each test pit measured approximately 30 feet long and 5 to 10 feet wide. However, in some cases, test pits were enlarged in an effort to identify the type and orientation of former gas plant structures. During excavation activities, the test pit walls and floor were investigated for evidence of MGP-related contamination (e.g., odors, staining, sheens, NAPL, elevated PID readings) and remnant structures. Soil from the test pits was described in accordance with the Unified Soil Classification System. During test pit activities, excavated soil was monitored for the presence of VOCs using a PID and visual/odor inspection. Test pits were logged and photographed. Test pit logs are provided in Appendix A and photographs are provided in Appendix B.

When visibly impacted soil was encountered in a test pit, one composite sample was collected from the test pit sidewalls for chemical analysis approximately 2 feet below the impacted zone. The purpose of this sample was to attempt to define the vertical extent of the impacted material. If the vertical extent of the impacted soil could not be confirmed due to a limitation in test pit depth, a grab sample was collected from the most contaminated zone (based on visual observations and PID readings) and analyzed. The vertical extent of impacts in that area was then confirmed as part of the soil boring program. When visibly impacted materials were no longer encountered in a test pit, one composite sample was collected for chemical analysis from the bottom of the test pit to confirm that impacted soil was not present. In several cases, multiple samples were collected from larger test pits. Additionally, when a holder foundation was encountered, the configuration of the test pit was modified in order to uncover a greater portion of the foundation and to observe the structural integrity and orientation of the foundation.

All soil samples selected for analysis during the test pit program were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) by EPA Method 8260, TCL semivolatile organic compounds (SVOCs) by EPA Method 8270, Target Analyte List (TAL) metals by EPA Method 6000/7000 Series and total cyanide by EPA Method 9012.

Test pits remained open only for the time required to perform the excavation, log and photograph the subsurface conditions, collect samples, and measure the dimensions of any subsurface features. The excavated soil was temporarily placed on plastic sheeting adjacent to the test pit and placed back into the excavation in the reverse order from which it was removed. When additional backfill materials were needed to restore the excavation to grade, bluestone was placed within the excavation. All test pits were then marked for follow-up survey.

The excavator bucket was decontaminated between each test pit location in accordance with the work plan.

Due to the fact that the test pits were completed in a portion of Tax Lot 3 that is used as a commercial parking area, each test pit excavation area was repaved with a 2-inch layer of asphalt. Prior to paving, each excavation was sawcut and compacted. In addition, all asphalt patches were lined with heated tar to ensure a proper seal.

For the purpose of characterizing the soil placed in on-site roll-offs, samples were collected directly from the 20-yard roll-off containers and were biased towards soil which visibly appeared to be most contaminated. The results of these analyses were used to properly characterize this investigation-derived waste at a Con Edison-approved disposal facility.

2.3 Soil Borings

Upon completion of the test pit excavations, a total of 29 soil borings were advanced to characterize subsurface soil, obtain a better understanding of bedrock topography, and to collect additional subsurface soil samples for laboratory analysis. Information acquired from the completed test pit program influenced the number, location and depth of the soil borings. Specifically, the test pit program provided a better understanding as to the location of former structures, as well as the extent of MGP residuals in shallow subsurface soil. It should be noted that soil borings SB-27, SB-28 and SB-29 were not part of the original Work Plan scope of work, but were added to the field program to obtain additional information within the southeast (SE) gas holder, park area and downgradient of impacted material found at SB-16, respectively.

The majority of soil borings were advanced to bedrock using a truck mounted drill rig. Bedrock was typically encountered between 19 and 55 feet below grade. The drill rig was equipped with 2-inch inside diameter hollow stem auger (HSA) drilling capabilities to advance through concrete and other subsurface obstacles. Where the HSA drilling method was unsuccessful and refusal was encountered, mud-rotary drilling techniques were implemented. Additionally, for soil boring locations where auger and mud-rotary techniques were not feasible due to access restrictions (i.e., landscaped area, loading dock and sidewalk), Geoprobe direct push technology was used for soil collection. In accordance with the work plan, soil borings installed within the former gasholders were advanced through the holder foundations only if NAPL-impacted materials were not encountered immediately above the holder foundation. At several locations, including SB-02 and SB-14, a steel surface casing was grouted into the holder foundation so that subsurface samples could be collected below the holder without the potential for vertical migration of tar or NAPL through the borehole annulus.

Soil samples were collected on a continuous basis using 2-foot long, 2-inch diameter, split-spoon samplers from the auger and mud-rotary capable drill rigs and 4-foot long, 2-inch diameter macrocore samplers from the Geoprobe rig. Each sample was split lengthwise and logged by field personnel. Logging consisted of: describing the soil in accordance with the Unified Soil Classification; describing any evidence of contamination (e.g., oil-like or tar-like NAPL, staining, sheens, odors); and screening for VOCs using a PID.

The following rationale was used in the selection of soil samples for laboratory analysis:

- One sample was collected from the zone with the highest PID readings or visual impacts. If no visual impacts or elevated PID readings were observed, a sample was collected from directly above the water table.
- If contamination was observed, an additional sample was collected below the impacted zone at or near the base of the boring to define the vertical extent of impacts at that location.

The samples were submitted to the laboratory for analysis of TCL VOCs, TCL SVOCs, TAL metals and total cyanide. Drill cuttings were placed in 55-gallon steel drums or placed in a 20-yard roll-off container for disposal in accordance with the work plan.

Five of the 29 soil borings were advanced at least 4 feet into bedrock to ascertain bedrock properties/competency and estimate potential migration pathways for contaminants. Once the bedrock interface was reached with the HSAs, an NX rock corer was advanced into the rock in order to collect a representative core sample. Rock cores were preserved in core boxes.

All sampling equipment (e.g., augers, split-spoon samplers and Geoprobe downhole equipment and tools) were decontaminated between sampling locations. Decontamination was conducted in accordance with the work plan. Soil boring locations were marked for identification during follow-up survey work.

Restoration activities associated with the well installation program included backfilling borings with native material. However, if a significant zone of contaminated soil was encountered, or if a boring was advanced through a gas holder foundation, a bentonite/cement grout was used to seal off the boring. All soil boring locations were capped off with bluestone and an asphalt patch.

2.4 Monitoring Well Installation and Development

Six groundwater monitoring wells were installed as part of the field program for use in providing groundwater quality and flow information, and to determine the presence/absence of NAPL in groundwater at the site. The actual location of each well is shown on Figure 2-1. In consultation with the NYSDEC, the proposed locations of the wells presented in the SCS Work Plan were modified in the field based on the results of the test pit investigation, soil boring field screening and available sample analytical results. Based on the understanding of site hydrogeology presented in the Parsons Historic Report, as well as the fate and transport of MGP residuals within the subsurface environment, all monitoring wells were installed in

unconsolidated sediments (overburden) and were set so that the well screen intercepts the water table.

All overburden monitoring wells were installed using 6 ½-inch diameter HSAs and a truck-mounted drill rig. The overburden wells were constructed of 2-inch diameter PVC with 10 feet of 0.02 slotted screens. Each well was constructed so that approximately 7 feet of the 10-foot screen was below the water table. A 2-foot sump was provided at the bottom of each well to provide a reservoir for dense non-aqueous phase liquid (DNAPL) accumulation. The annular space around the well screen was backfilled with sand filter pack extending from the bottom of the well to 1 to 2 feet above the screen. The annular space around the well riser was sealed with bentonite pellets extending 1 to 2 feet above the sand filter pack (Morie #2) and completed with a cement mixture to approximately 1 foot below grade. All monitoring wells were completed with flush-mounted locking manhole covers. A summary of the monitoring well construction for all six wells is provided in Table 2-3.

After a minimum of 24-hours following installation, each newly installed monitoring well was developed via pumping. Additionally, the four on-site existing wells were also developed. A minimum of three to five well volumes was pumped from each well. The well development water was monitored for turbidity and water quality indicators (i.e., pH, dissolved oxygen, oxidation-reduction potential, temperature, and specific conductivity) with measurements collected approximately every 10 minutes. Development continued until turbidity measurements were less than 50 nephelometric turbidity units (NTUs) for three successive readings or until water-quality indicators stabilized, whichever occurred first. The criteria for stabilization required three successive readings within 10% for pH, temperature and specific conductivity.

HSAs were decontaminated between monitoring well locations by steam cleaning using a tap water/Simple Green® solution. Decontamination was conducted in accordance with the work plan. All monitoring well drill cuttings, well development water, decontamination, and purge water was containerized in 55-gallon steel drums, 20-yard roll-off containers or poly tanks and handled in accordance with the work plan. Restoration activities included asphalt patching

TABLE 2-3

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
MONITORING WELL CONSTRUCTION SUMMARY

MONITORING WELL	WELL DEPTH	TOTAL DEPTH	MEASURING POINT ELEVATION[1]	CASING DIAMETER	SCREENED DEPTHS (feet bgs)		ANNULAR FILLS (feet bgs)		
	(feet bgs)	(feet bgs)	(feet)	(inches)	Interval	Description	Interval	Type	Material
MW-01	19.00	29.00	7.54	2.00	7-17	0.020" Slotted PVC	0-3	Seal	Cement
							3-5	Seal	Bentonite
							5-19	Filter	Sand Pack (Morie #2)
MW-02	19.00	33.00	8.26	2.00	7-17	0.020" Slotted PVC	0-3	Seal	Cement
							3-5	Seal	Bentonite
							5-19	Filter	Sand Pack (Morie #2)
MW-03	19.00	35.00	9.28	2.00	7-17	0.020" Slotted PVC	0-3	Seal	Cement
							3-5	Seal	Bentonite
							5-19	Filter	Sand Pack (Morie #2)
MW-04	19.00	19.00	9.15	2.00	7-17	0.020" Slotted PVC	0-3	Seal	Cement
							3-5	Seal	Bentonite
							5-19	Filter	Sand Pack (Morie #2)
MW-05	19.00	42.00	10.01	2.00	7-17	0.020" Slotted PVC	0-3	Seal	Cement
							3-5	Seal	Bentonite
							5-19	Filter	Sand Pack (Morie #2)
MW-06	19.00	49.00	10.15	2.00	7-17	0.020" Slotted PVC	0-3	Seal	Cement
							3-5	Seal	Bentonite
							5-19	Filter	Sand Pack (Morie #2)

Notes:

[1] Top of casing elevation

bgs: Below ground surface

around the manhole covers for wells located in the parking lot area and a cement pad placed around MW-01 located in the park area.

2.5 Groundwater Sampling and Water Level Measurements

Several days following the development of monitoring wells, groundwater samples were collected from the newly installed wells, as well as the four existing wells. Prior to collecting the samples, the depth to groundwater was measured in the wells using an electronic oil/water interface probe attached to a measuring tape accurate to 0.01 foot. The probe was lowered to the bottom of each well to check for the presence of DNAPL.

The water level data, well diameter and depth were used to calculate the volume of water in each well. The wells were then purged using low-flow purging techniques as described in the work plan. Groundwater samples were collected using dedicated pump tubing and hand bailers, and placed directly into laboratory-supplied sample bottles. The samples were submitted for laboratory analysis for Target Compound List (TCL) VOCs, TCL SVOCs, TAL metals, total cyanide and amenable cyanide. Sample containers for VOC and metals analysis were pre-preserved in the laboratory.

All nondedicated sampling equipment (e.g., submersible pumps and oil/water interface probe) were decontaminated between sampling locations in accordance with the work plan. All decontamination water was placed in 55-gallon drums or poly tanks and handled as described in work plan.

Water Level Measurements

In addition to the initial round of groundwater levels to be obtained during the sampling activities described in the previous section, four rounds of synoptic water level measurements were collected around high and low tides in order to assess the tidal influence on groundwater flow at the site. Water levels were obtained at each of the new and existing monitoring wells at

the site. Each well was also gauged for the presence of NAPL during each round of measurements. Water level and NAPL measurements are presented in Table 2-4.

2.6 Site Survey

At the completion of installation activities, all test pits, soil borings and monitoring wells were surveyed by a New York State-licensed surveyor for production of a composite base map. Two elevation measurements were taken at each well location: the elevation on the rim of the gate box or protective casing and the elevation of the top of PVC casing. The survey elevations were measured to an accuracy of 0.01 foot in accordance with the National Geodetic Vertical Datum of 1929 (an approximation of mean sea level).

2.7 Historical Map Research Investigation

An additional historical map research investigation was completed to help further identify the location of the former naphthalene and light oil tanks formally located on Block 1107. In all, five Sanborn maps (1890-1930), ten Bromley maps (1897-1974) and one Hyde map (1913) were obtained. Section 4.5 provides background information and a description of the findings, while the maps have been provided in Appendix E.

2.8 Laboratory Analysis and Data Management

The data collected as part of and in support of the field investigations for the site and surrounding areas was managed using the GIS/Key Data Management System. GIS/Key was utilized for the management of both geological and chemical data. Boring logs and monitoring well construction logs were entered into GIS/Key in order to establish a geological database as well as produce geologic cross sections for the site.

TABLE 2-4
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY
GROUNDWATER MEASUREMENTS AND CALCULATED ELEVATIONS

MONITORING WELL	DATE / TIME		TIDE	MEASURING POINT ELEVATION [1] (feet above MSL)	DEPTH TO WATER (feet)	WATER ELEVATION (feet above MSL)
MW-01	11/07/2003	1:37 PM	Low Tide	7.54	7.67	-0.13
	11/10/2003	8:54 AM	High Tide		7.85	-0.31
	11/10/2003	12:20 PM	Mid Tide		7.83	-0.29
	11/10/2003	3:37 PM	Low Tide		7.80	-0.26
MW-02	11/07/2003	1:37 PM	Low Tide	8.26	8.70	-0.44
	11/10/2003	8:54 AM	High Tide		8.84	-0.58
	11/10/2003	12:20 PM	Mid Tide		8.79	-0.53
	11/10/2003	3:37 PM	Low Tide		8.72	-0.46
MW-03	11/07/2003	1:37 PM	Low Tide	9.28	12.65	-3.37
	11/10/2003	8:54 AM	High Tide		12.81	-3.53
	11/10/2003	12:20 PM	Mid Tide		12.81	-3.53
	11/10/2003	3:37 PM	Low Tide		12.77	-3.49
MW-04	11/07/2003	1:37 PM	Low Tide	9.15	9.36	-0.21
	11/10/2003	8:54 AM	High Tide		9.60	-0.45
	11/10/2003	12:20 PM	Mid Tide		9.57	-0.42
	11/10/2003	3:37 PM	Low Tide		9.57	-0.42
MW-05	11/07/2003	1:37 PM	Low Tide	10.01	13.85	-3.84
	11/10/2003	8:54 AM	High Tide		13.96	-3.95
	11/10/2003	12:20 PM	Mid Tide		13.94	-3.93
	11/10/2003	3:37 PM	Low Tide		13.95	-3.94
MW-06	11/07/2003	1:37 PM	Low Tide	10.15	12.26	-2.11
	11/10/2003	8:54 AM	High Tide		12.36	-2.21
	11/10/2003	12:20 PM	Mid Tide		12.35	-2.20
	11/10/2003	3:37 PM	Low Tide		12.34	-2.19
LMW-01	11/07/2003	1:37 PM	Low Tide	9.33	16.18	-6.85
	11/10/2003	8:54 AM	High Tide		16.31	-6.98
	11/10/2003	12:20 PM	Mid Tide		16.25	-6.92
	11/10/2003	3:37 PM	Low Tide		16.22	-6.89
LMW-02	11/07/2003	1:37 PM	Low Tide	10.77	19.70	-8.93
	11/10/2003	8:54 AM	High Tide		19.70	-8.93
	11/10/2003	12:20 PM	Mid Tide		19.70	-8.93
	11/10/2003	3:37 PM	Low Tide		19.70	-8.93
LMW-03	11/07/2003	1:37 PM	Low Tide	8.72	4.51	4.21
	11/10/2003	8:54 AM	High Tide		4.87	3.85
	11/10/2003	12:20 PM	Mid Tide		4.84	3.88
	11/10/2003	3:37 PM	Low Tide		4.84	3.88
LMW-04	11/07/2003	1:37 PM	Low Tide	9.19	--	--
	11/10/2003	8:54 AM	High Tide		--	--
	11/10/2003	12:20 PM	Mid Tide		--	--
	11/10/2003	3:37 PM	Low Tide		--	--

Notes:
[1] Top of casing elevation.
MSL: mean sea level
-- : Information not available.

The analytical data was transmitted by the laboratory, in both hard copy and electronic disk deliverable (EDD) format. The EDD was submitted in a database file (dbf) format for direct import into GIS/Key. Once the data was imported into GIS/Key, reports were generated and checked against the hard copy data packages to ensure data integrity and completeness.

2.9 Data Validation/Data Usability Summary

Data validation was performed in accordance with the USEPA Region I validation guidelines for organic and inorganic data review. These validation guidelines are regional modifications to the National Functional Guidelines for organic and inorganic data review (USEPA 1994). Validation included the following:

- Verification of 100% of all QC sample results (both qualitative and quantitative);
- Verification of the identification of 100% of all sample results (both positive hits and nondetects);
- Recalculation of 10% of all investigative sample results; and
- Preparation of a Data Usability Summary Report (DUSR).

Data reduction, validation, and reporting procedures were followed as required by the Quality Assurance Project Plan dated June 2003.

2.10 Data Usability Summary Report

Soil boring, test pit and groundwater samples were collected as part of the field investigation at the Con Ed West 42nd Street site. The samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals and total cyanide. The groundwater samples were also analyzed for amenable cyanide. sample analysis was performed by Mitkem Corporation in accordance with USEPA SW-846 methodologies and NYSDEC 6/00 Analytical Services Protocol (ASP) requirements.

The data packages submitted by Mitkem were reviewed for completeness and contractual compliance. Data validation was performed in accordance with the USEPA guidelines. The findings of the validation process are summarized below.

All samples were analyzed within the method specified holding times with the exception of the SVOC fraction of MW-05. The semivolatile fraction of sample MW-05 was extracted with a contaminated blank. The sample was re-extracted 7 days from receipt; however, the data from the re-extract is considered the best set and has been included on the data summary tables.

Several of the volatile and semivolatile samples had surrogate recoveries and/or internal standard area counts outside QC limits. These samples were re-extracted and/or reanalyzed and the most contractually compliant results have been summarized on the data summary tables. In addition, several of the volatile and semivolatile samples required reanalysis at secondary dilutions due to select compound concentrations exceeding the instrument calibration range. The results of the select compounds were taken from the diluted analysis and are qualified with a "D" on the data summary tables.

The bis(2-ethylhexyl)phthalate result for sample TP-1 has been qualified as non-detect due to blank contamination. That is, the method blank associated with the sample also contained bis(2-ethylhexyl)phthalate and the sample concentration was less than five times that of the blank.

All results for sample SB-01 (22-26') have been qualified as estimated due to percent solid of 20 percent.

The semivolatile fraction of sample SB-02 (17-19') was reanalyzed at a dilution due to the high concentration of target compounds in the initial undiluted run; however, several of the compounds were diluted out. Therefore, the data from the initial run is considered the best set and the affected compounds have been qualified "E" on the data summary tables.

The laboratory reported naphthalene in both the VOC and SVOC analysis; however, for site assessment purposes, the results from the SVOC analysis are the ones that have been reported and utilized. As part of the review process, the naphthalene results for both fractions were compared to assess accuracy in both analyses.

The work plan stated that the groundwater samples were to be run for available cyanide. Upon review of the methodologies, it was deemed that the method for amenable cyanide would yield the same result as that for available cyanide. The QC runs for the amenable cyanide indicated that the analysis was complete and accurate.

No other problems were found with the sample results and all data is deemed valid and usable for environmental assessment purposes, as qualified above.

3.0 SITE GEOLOGY AND HYDROGEOLOGY

3.1 Introduction

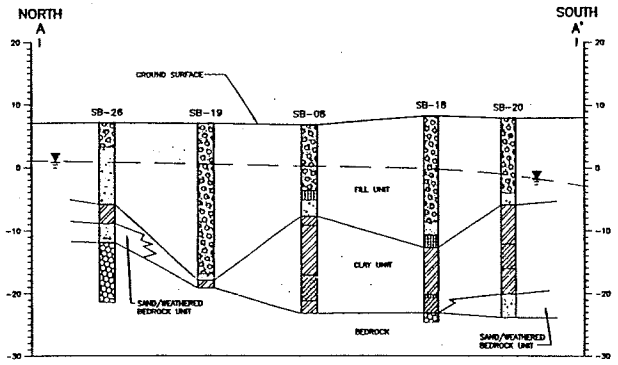
The following section presents the findings, as well as a discussion and interpretation of geologic and hydrogeologic data collected during the field investigation. Information utilized in support of this evaluation include the following:

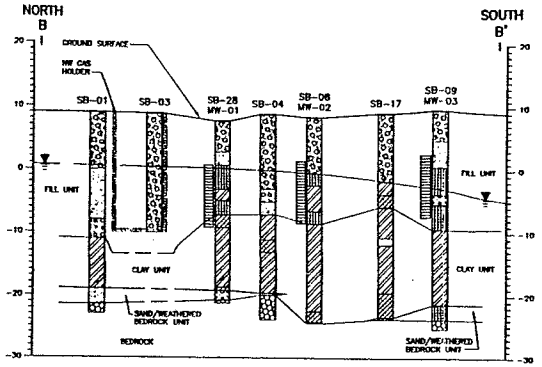
- Logs from completed test pits, borings and groundwater monitoring wells;
- Hydraulic head measurements from the on-site groundwater monitoring wells.
- Geologic data obtained from previously completed site investigations;
- Historical maps showing the former shoreline of the Hudson River;

Based on the information described above, six geologic cross sections of the site were generated, and are provided on Figures 3-1 through 3-4. Figures 3-1 and 3-2 present north-south geologic cross sections A-A', B-B' C-C' and D-D' which traverse the site from West 42nd Street to West 41st Street. Cross section A-A' traverses the landscaped area. Cross sections B-B', C-C' and D-D' traverse the western, central and eastern portions of Tax Lot 3, respectively. Figures 3-3 and 3-4 present east-west cross sections E-E' and F-F', which traverse the site from 12th to 11th Avenues. The locations of test pits, borings and monitoring wells referenced in this section are shown on Figure 2-1, and the logs are included in Appendix A.

3.2 Site Stratigraphy

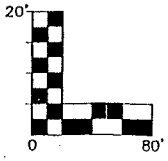
The review of available historic maps indicate that prior to the 1840s, the land that comprised the former MGP site consisted of a shallow embayment of the Hudson River referred to as Norton's Cove. The historic maps also indicate that the easternmost portion of the former MGP site (Tax Lot 3) included a small tidal stream that discharged to Norton's Cove. By the 1850s, much of Norton's Cove, along with the tidal creek, appears to have been filled.

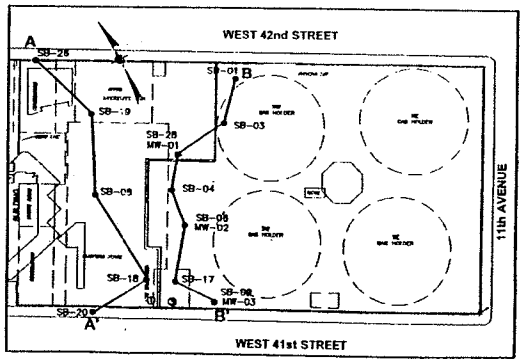




LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED
- SOIL BORING
- WELL SCREEN FOR MONITORING WELL
- GROUND SURFACE
- STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED
- ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL, DASHED WHERE INFERRED





KEY MAP
SHOWING CROSS-SECTION LINE

SCALE:1"=100'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

NORTH-SOUTH GEOLOGIC CROSS SECTIONS A-A' AND B-B'

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

FIGURE 3-1

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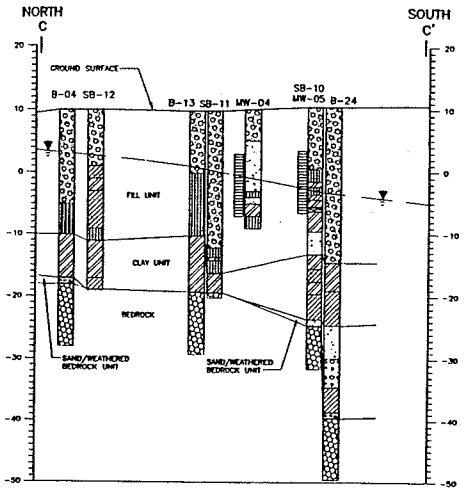
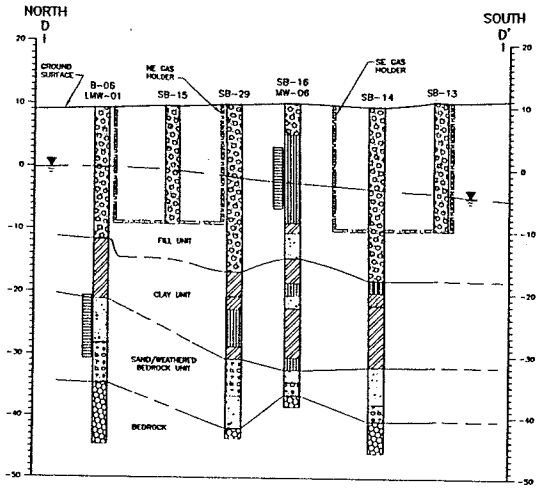
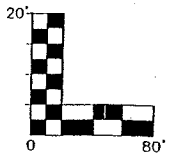


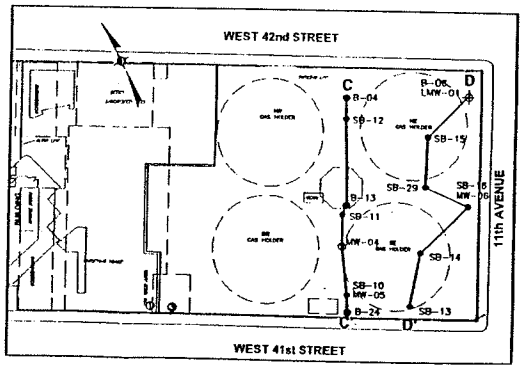


LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED

- SOIL BORING
- WELL SCREEN FOR MONITORING WELL
- GROUND SURFACE
- STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED
- ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL. DASHED WHERE INFERRED





KEY MAP
SHOWING CROSS-SECTION LINE

SCALE: 1"=100'

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

NORTH-SOUTH GEOLOGIC CROSS SECTIONS C-C' AND D-D'

FIGURE 3-2

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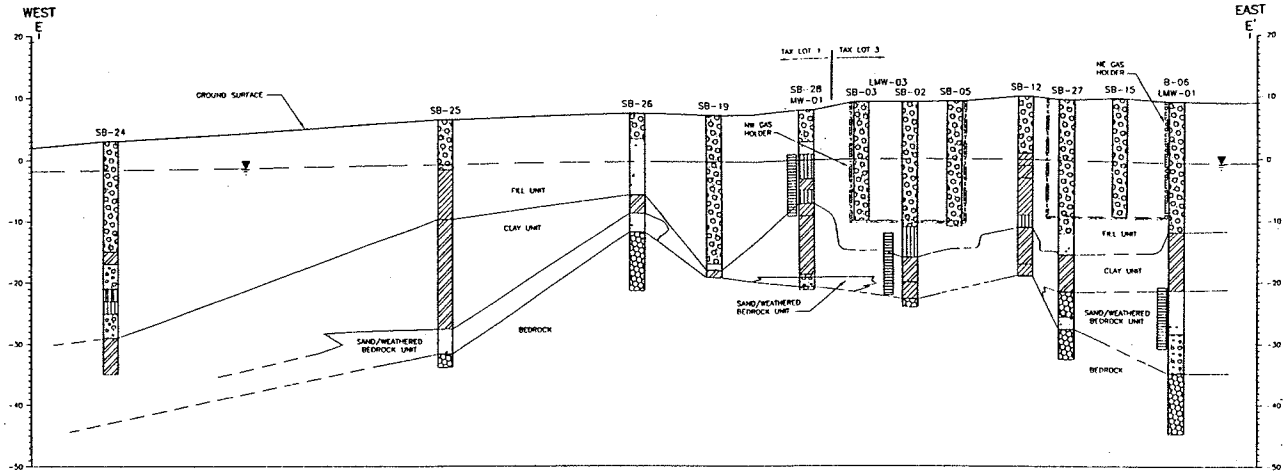
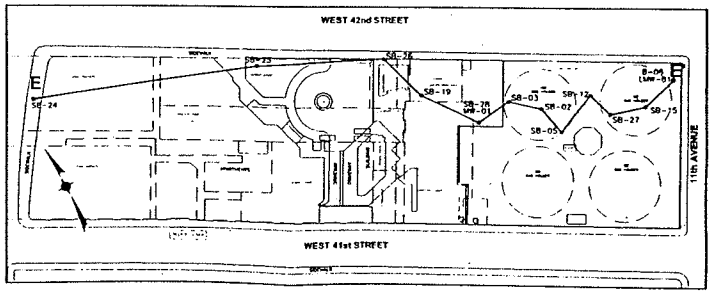


LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED

- SOIL BORING
- WELL SCREEN FOR MONITORING WELL
- GROUND SURFACE
- STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED
- ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL. DASHED WHERE INFERRED

20'
0
100'



KEY MAP
SHOWING CROSS-SECTION LINE

SCALE: 1"=150'

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

EAST-WEST GEOLOGIC CROSS SECTION E-E'

FIGURE 3-3

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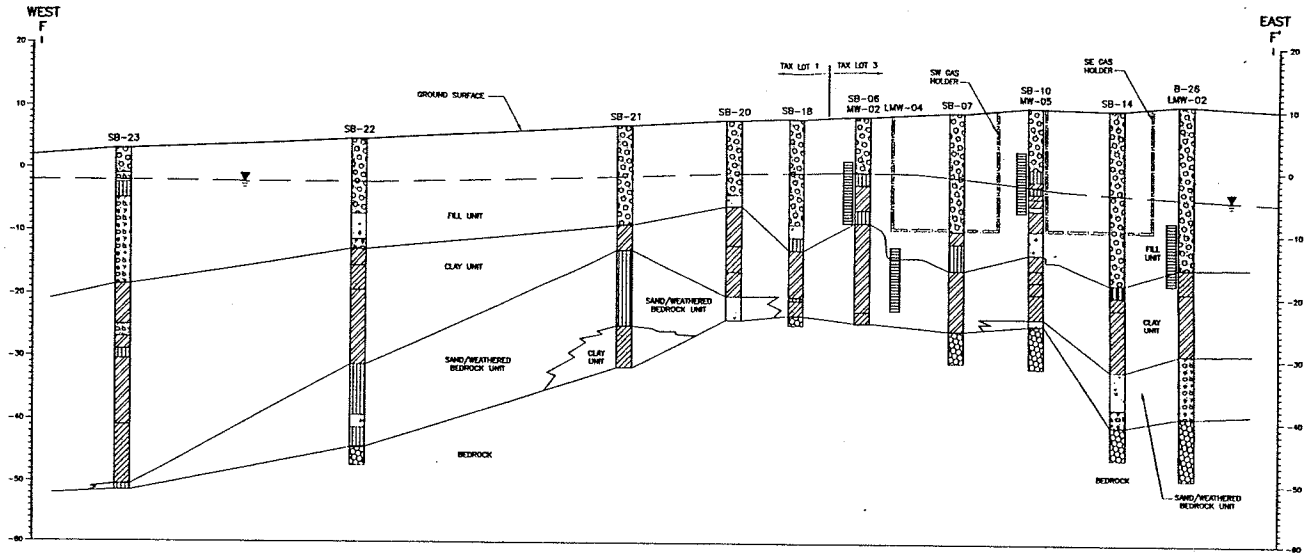
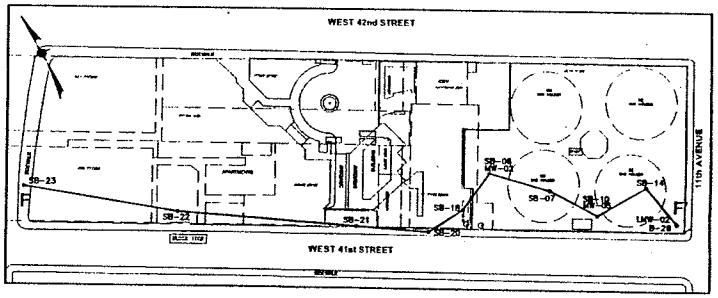


LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED

- SOIL BORING
- WELL SCREEN FOR MONITORING WELL
- GROUND SURFACE
- STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED
- ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL. DASHED WHERE INFERRED

20' 0 100'



KEY MAP
SHOWING CROSS-SECTION LINE

SCALE: 1"=150'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

EAST-WEST GEOLOGIC CROSS SECTION F-F'

FIGURE 3-4

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Throughout the next 10 years additional fill appears to have been added, creating the western shoreline of the site prior to construction of the MGP.

Based on the soil borings completed as part of this site investigation, as well as the documented historic filling that occurred at the former MGP site, the upper 15 to 25 feet of soil across the site consists of fill material containing significant quantities of anthropogenic materials such as brick, concrete, metal and wood timbers. All former MGP structures uncovered during the Test Pitting Program were located within this fill. At the lower portion of the fill, there exists a discontinuous thinner strata of sand-rich soil that contains little to no anthropogenic materials. While this sand-rich strata does not contain a large amount of anthropogenic material, it is assumed that it is also non-native fill material due to the fact that it directly overlies a dense silty clay, which is believed to be the former bottom of Norton's Cove. Mollusk and gastropod shell fragments were encountered in many of the samples recovered from the silty clay, indicative of a marine environment. A number of discontinuous lenses of sand were encountered in the silty clay that likely represent former tidal channels and creeks such as the tidal creek referenced above. Below the clay unit exists a discontinuous layer of sand, which directly rests on weathered and unweathered bedrock of the Manhattan Schist Formation. Based on these findings, the site stratigraphy appears to be divided into the following geologic units:

- Fill Unit and Former MGP Structures
- Clay Unit
- Sand/Weathered Bedrock Unit
- Bedrock

The following presents additional discussion concerning each unit.

3.2.1 Fill Unit and Former MGP Foundation Structures

The Fill Unit which directly underlies Tax Lots 1 and 3 consists of a silty to gravelly sand containing relatively large quantities of anthropogenic materials such as brick, wood timbers,

concrete and metal. The Fill Unit also contains large blocks of mica schist up to 4 square feet in area. Due to the variability of grain size, the Fill Unit likely exhibits highly variable permeability. The color of the fill ranges from gray, brown, black and tan, with some yellow and red. As shown on the cross sections provided on Figures 3-1 through 3-4, the Fill Unit appears to be up to 28 feet thick in the vicinity of the former gas holders. In general, the Fill Unit is 15 to 25 feet thick within Tax Lot 3. The Fill Unit also gradually increases in thickness under Tax Lot 1 towards the Hudson River with a maximum thickness of 32 feet at SB-24, located along 12th Avenue. The unit appears to be at a minimum thickness of 13 feet at SB-26, located along the southern sidewalk of West 42nd Street.

The Fill Unit was investigated as part of the test pit phase of the field investigation, which was designed to locate the subsurface remnants of MGP structures and/or other historic subsurface structures that might exist at the site. Underground structures within the fill were encountered in the following test pits:

- At test pit TP-02, two brick walls were encountered along the westernmost edge of the excavation. Based on historical maps of the former MGP structures at the site, the two brick walls are believed to be associated with the eastern edge of the former Purifying House located on Tax Lot 3. The top of the easternmost wall was approximately 4 feet bgs and 2 feet wide, while the adjacent wall, located approximately 5 feet to the west, was 6 feet bgs and 2 feet wide. The two walls were joined by a common foundation approximately 9 feet bgs. Saturated soil with an apparent sheen was observed between the two walls. The easternmost wall is believed to be the outer edge of the Purifying House and is located approximately 10 feet further west than originally believed based on a previously completed review of historical documents.

- A concrete foundation and vertical concrete wall were encountered along the northern portion of test pit TP-03. The foundation covered approximately 145 square feet in area and the wall extended 2 feet high from approximately 4 feet bgs. A 1955 Bromley Map Plate (Plate 69), provided in Appendix E of this report, depicts a central railway platform and office utilized by the Railway Express Agency located within the central portion of Tax Lot 3 running east to west. Based on the location and orientation of the concrete foundation and wall, we believe that the uncovered structures represent a portion of the northwest corner of the railway office foundation and wall.

- A horizontal brick wall was encountered along the southwestern portion of test pit TP-06. Based on its location and historic maps, the brick wall is assumed to be part of

the southeast (SE) former gas holder which had collapsed to the east, within the former gas holder.

- A brick wall was encountered running northeast to southwest through the southern portion of test pit TP-07. The top of the wall was approximately 2 feet bgs and 2 feet wide, and based on an obvious SE curvature, the brick wall was assumed to be associated with the southeast former gas holder. Additionally, a 12-inch pipe was encountered running vertically just outside (and possibly connected) to the former gas holder brick wall. The pipe was encountered approximately 10 feet bgs with a metal cover and extended 19.5 feet bgs based on sounding measurements. The metal cover was removed and a disposable bailer was used to collect an observation sample from the water within the pipe. Although strong naphthalene-like odors were present, no apparent NAPL or sheen was observed from the water. Based on the close proximity of the pipe to the former gas holder brick wall and the vertical direction, the pipe is believed to be a main gas line associated with the SE former gas holder. Furthermore, a concrete foundation and an associated vertical concrete wall were uncovered directly over the southern portion of the former gas holder brick wall approximately 1.5 feet bgs. The concrete structure was constructed directly on top of the former gas holder brick wall with a portion of the brick wall removed in order to accommodate the concrete foundation. Several historic maps show a gasoline station within this general area; however, it cannot be ascertained whether the observed concrete structure was part of the railway office found in TP-03 or part of the former gasoline station given both were built in close proximity of one another and constructed with similar materials.

- A brick wall was encountered running east to west through the central portion of test pit TP-08. Due to the limits of the excavation, it could not be determined as to the direction in which the brick wall was curving. However, due to the close proximity of the wall to the southeast portion of the site and the lack of evidence of former structures within SB-29 (just north of the test pit), the brick wall was assumed to be associated with the SE former gas holder wall.

Within portions of the site, the Fill Unit transitions into a sand-rich zone between a depth of 4 and 24 feet bgs, consisting of a brown to black stained and poorly sorted coarse to medium sand. The black colorization may be attributed to tar staining in the vicinity of the former gas holders and the Purifying House. Due to this staining, as well as the overall variation in grain size of the shallower fill material, the boundary between the upper and lower fill zones is not obvious at all locations. However, the sand-rich fill zone appears to be present within the vicinity of the former gas holders. As shown on the east-west cross sections provided on Figures 3-3 and 3-4, the sand-rich fill zone is encountered up to 6 feet thick below the former gas holder foundations as indicated by SB-02, SB-07 and SB-27. It is possible that the sand-rich fill zone

represents fill material placed on top of the clay unit in order to construct the holder foundations, as well as other former MGP structures. Due to the coarse nature of this fill unit, it likely exhibits fairly high porosity.

3.2.2 Clay Unit

Immediately below the fill exists a continuous Clay Unit. The Clay Unit consists of a dense gray to black organic silty clay, containing peat and wood in some areas. The peat likely represents former tidal marsh areas within Norton's Cove prior to filling. In addition, numerous samples of the Clay Unit contained fragments of mollusks and gastropods typical of marine environments further supporting the hypothesis that the Clay Unit likely represents the former bottom of Norton's Cove. As shown on the north-south cross sections provided on Figures 3-1 and 3-2, the Clay Unit also contains a number of discontinuous silty sand lenses which are likely associated with channels and tidal creeks. These "channel deposits" appear to be oriented in an east-west direction which would be expected if the former channels were flowing towards the Hudson River. The Clay Unit ranges in thickness from less than 2 feet at SB-19, located within the Landscaped Area, to as much as 18 feet at SB-25. Under Tax Lot 3, the clay unit is typically 8 to 14 feet thick. Additionally, as shown on the east-west cross sections, the Clay Unit increases in thickness under Tax Lot 1 towards the Hudson River. Due to its thickness and clay-rich nature, the Clay Unit likely serves as an effective confining unit.

3.2.3 Sand/Weathered Bedrock Unit

A relatively thin and discontinuous layer of poorly sorted sand is present at several locations within the site immediately below the Clay Unit. This sand layer also appears to contain a thin zone of weathered bedrock resting directly on competent unweathered bedrock and, therefore, it is referred to as the Sand/Weathered Bedrock Unit. The Sand/Weathered Bedrock Unit contains varying amounts of coarse gravel, along with angular boulders and cobbles of mica schist. As illustrated on the north-south and east-west cross sections, this geologic unit is thickest within the eastern portion of Tax Lot 3 but virtually absent in the western portion of Tax Lot 3. As indicated on the east-west cross sections, the Sand/Weathered

Bedrock Unit is present on Tax Lot 1 and as much as 13 feet thick at SB-22, located within the loading bay along West 41st Street.

3.2.4 Bedrock

Underlying all the unconsolidated geologic units discussed above exists a black to gray crystalline mica schist of the Manhattan Schist Formation. Core samples of the bedrock were collected at five boring locations up to 10 feet in depth. Inspection of the recovered cores indicates the bedrock, while being fairly competent, contained numerous horizontal and vertical factures which may serve as secondary porosity or groundwater pathways within the bedrock.

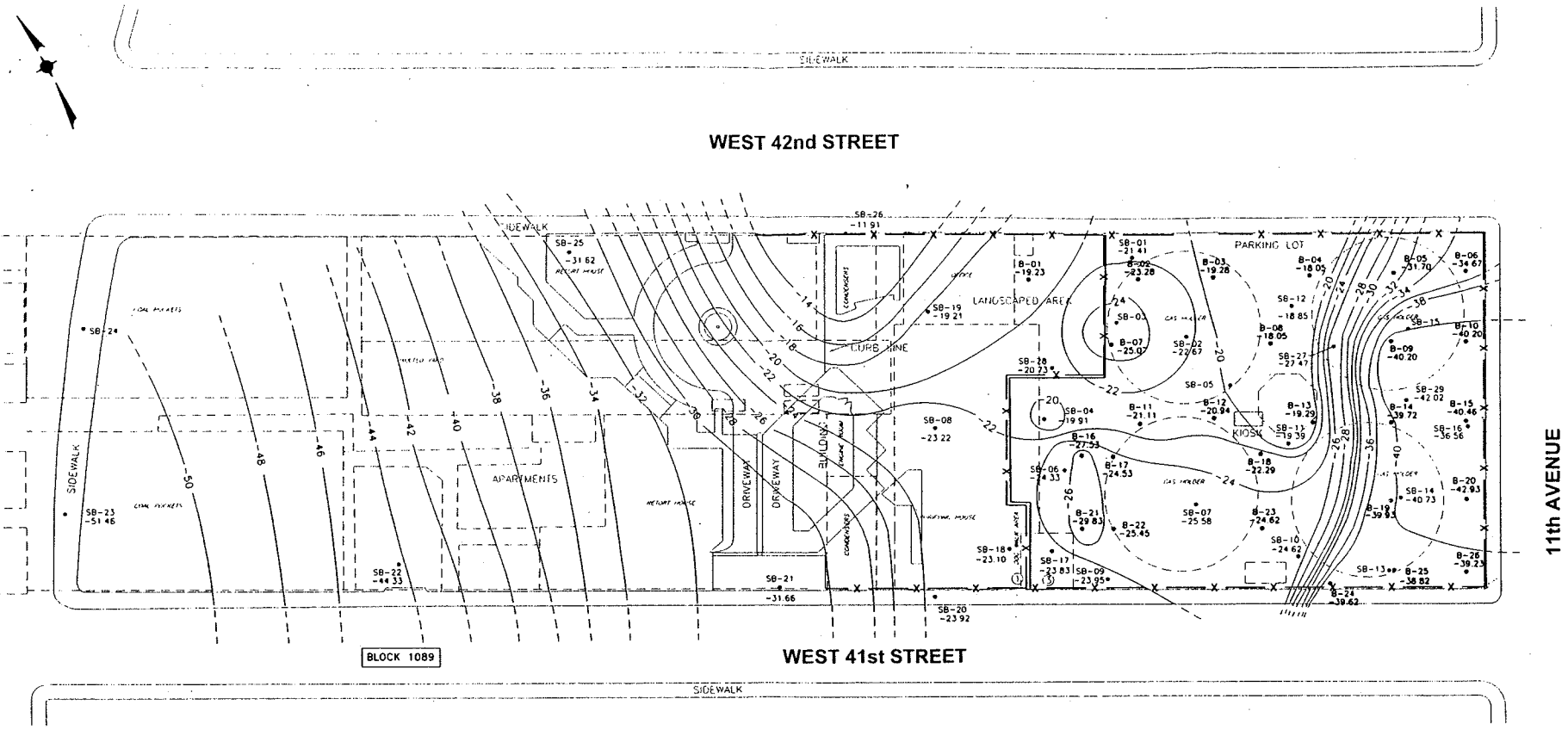
Figure 3-5 provides the contour surface of the bedrock based on the borings completed as part of the SCS, as well as the Langan Engineering geotechnical study completed in July 2000. Based on the review of Figure 3-5, the bedrock surface is relatively flat within the western half of Tax Lot 3 with an elevation between 19 and 24 feet below mean sea level (msl). However, the bedrock appears to dip steeply to the east in the eastern third of Tax Lot 3 and dips to the west at a gentler slope under Tax Lot 1, towards the Hudson River.

3.3 Site Hydrogeology

As discussed in Section 2.5, all monitoring wells installed as part of the SCS were installed on the eastern portion of the site within Tax Lot 3. As a result, the discussion of site hydrogeology is limited to this portion of the former MGP site.

Tidal Influence

In order to determine if groundwater at Tax Lot 3 is tidally influenced, water levels were collected during high, mid and low tidal stages of the Hudson River on one day. Based on these hydraulic head measurements presented on Table 2-4, groundwater elevations within Tax Lot 3 are *not* tidally influenced.



LEGEND:

——— -20 – – –	BEDROCK SURFACE CONTOUR, IN FEET (MSL) DASHED WHERE INFERRED
SB-07 -25.58 •	SOIL BORING LOCATION WITH ELEVATION OF BEDROCK SURFACE, FEET (MSL)
B-22 -25.45 •	LANGAN ENGINEERING GEOTECHNICAL ENGINEERING STUDY, JULY 2000 SOIL BORING LOCATION WITH ELEVATION OF BEDROCK SURFACE, FEET (MSL)

0 60
SCALE IN FEET

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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

ELEVATION OF BEDROCK SURFACE

FIGURE 3-5

Hydraulic Conductivity of Geologic Units

The review of well development records for the six shallow monitoring wells installed in the Fill Unit as part of the SCS, indicate these wells exhibited relatively poor flow rates, with the maximum sustained pumping rates ranging from 0.1 to 0.25 gallons per minute (gpm). Pumping above these rates resulted in the wells running dry in a relatively short period of time. In addition, recharge rates after discontinuing pumping was found to be as low as 1 foot per hour. This data indicates that while the hydraulic conductivity of the Fill Unit is highly variable due to the nature of the material, hydraulic conductivities are relatively low and the material has poor water transmitting properties.

While well construction records are not available for the four existing monitoring wells installed within Tax Lot 3 prior to Con Edison undertaking the SCS, the wells appear to be screened within the Sand/Weathered Bedrock Unit and/or the overlying Clay Unit based on the measured total depth of each well.

Based on the depth of existing monitoring wells LMW-01 and LMW-03 and site stratigraphy, both wells appear to be screened primarily within the Sand/Weathered Bedrock Unit. Sustained pumping rates of between 0.5 and 1.0 gpm were achieved for these wells during redevelopment indicating the Sand/Weathered Bedrock Unit has a relatively low hydraulic conductivity, but fair water transmitting properties when compared to the other site geologic units.

Existing monitoring wells LMW-02 and LMW-04 appear to be primarily screened within the Clay Unit. Both monitoring wells exhibited very poor pumping rates of less than 0.1 gpm and LMW-02 was pumped dry at less than 0.1 gpm. This data supports the concept that the Clay Unit has poor water transmitting properties and serves as an effective confining unit.

Groundwater Flow

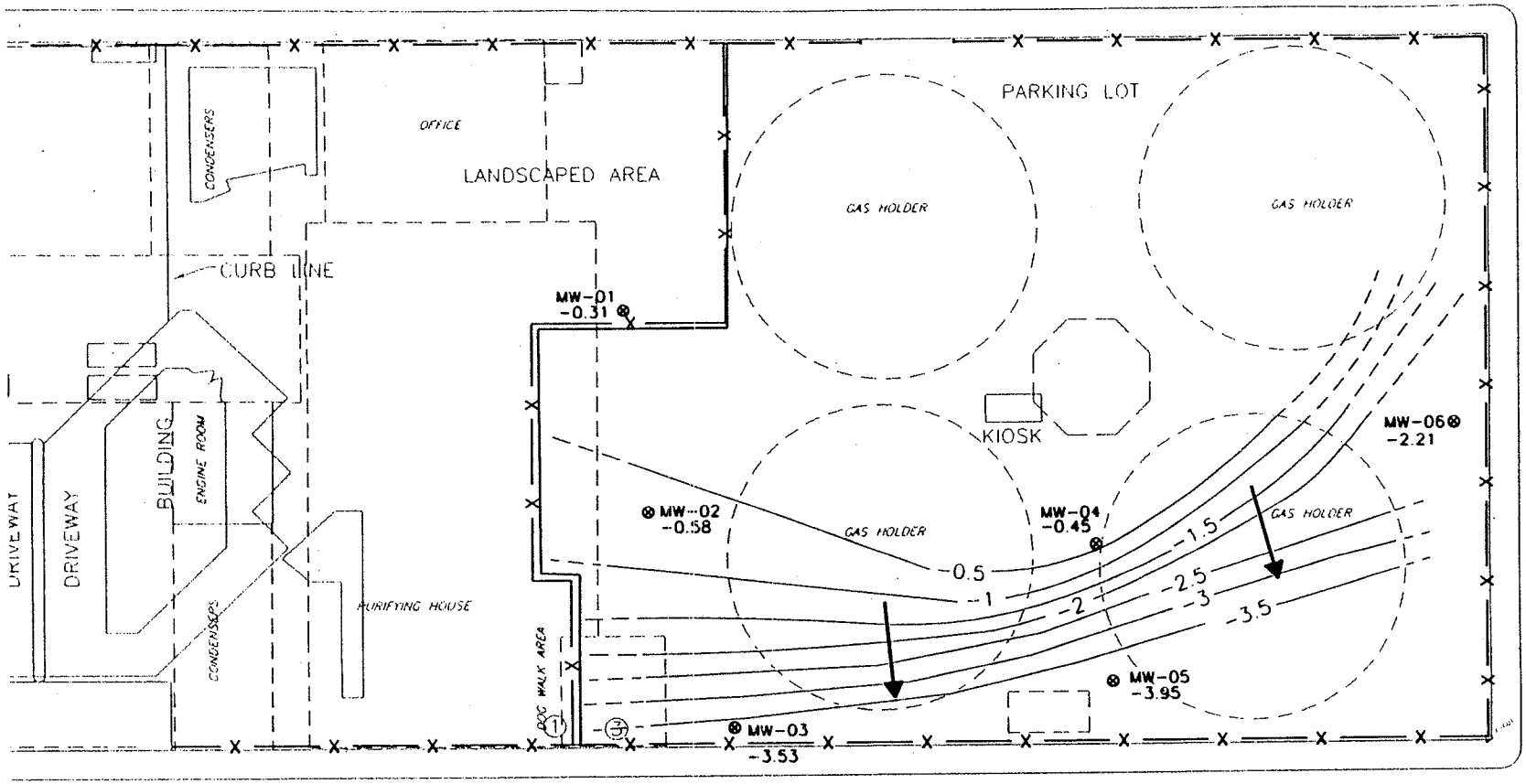
Groundwater flow patterns are complex within Tax Lot 3 due to a number of factors, including:

- The majority of the soil below the water table is comprised of fill material with highly variable permeabilities and hydraulic conductivities.
- The former gas holder foundations were constructed below the water table and, therefore, likely obstruct the flow of groundwater.
- Prior to development, the site consisted of a shallow marine embayment with a number of tidal channels and tidal creeks oriented in an east/west direction. These former channels/creeks may serve as preferred flow pathways for groundwater.
- The site is located in a highly urbanized area containing numerous storm sewers and utility conduits that may serve as "drains" for groundwater, directly influencing groundwater flow direction.
- The ongoing "dewatering" of basements, subway tunnels or other structures in the vicinity of the site also have a direct influence on groundwater flow rates and direction.

Figure 3-6 is a water table contour map for Tax Lot 3 that was generated using water level measurements from the six on-site wells installed at the water table as part of the SCS. Note that the existing on-site wells were not utilized in Figure 3-6 as these wells were screened well below the water table. Based on the review of Figure 3-6, groundwater generally appears to flow in a southerly direction at Tax Lot 3 and is generally located 8 to 14 feet below grade.

It is worthy to note that environmental investigations previously conducted within the former MGP site assumed groundwater flow to be in a westerly direction towards the Hudson River. However, the 2003 site investigation conducted at the Exxon/Mobil Service Station located directly north of Tax Lot 3 by Roux Associates determined that the groundwater flow direction is to the south. It is likely that groundwater flow at Tax Lot 3 is being influenced by one or more of the factors listed and described above.

WEST 42nd STREET



WEST 41st STREET

11th AVENUE

LEGEND:

———— -0.5 – – – – WATER TABLE CONTOUR INTERVAL, IN FEET (MSL) DASHED WHERE INFERRED

→ APPROXIMATE DIRECTION OF GROUNDWATER FLOW

SCALE: 1"=50'

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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

WATER TABLE CONTOUR MAP
HIGH TIDE - NOVEMBER 10, 2003

FIGURE 3-6

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4.0 FINDINGS

4.1 Introduction

This section provides a detailed discussion of the Site Characterization Study (SCS) chemical results. The analytical data from this SCS field investigation along with relevant historical data and other information are used to identify the presence and types of chemicals in the environment, their likely source(s), and the extent to which various chemical constituents have migrated on or from the site. In addition, this section provides an assessment of exposure pathways in which individuals might be exposed to site related chemical constituents.

The discussion of the investigation results is organized according to the subdivision of the site where the site has been grouped into two general investigation areas; Tax Lot 1 and Tax Lot 3. The Tax Lot 1 field investigation was limited to the completion of soil borings, whereas the Tax Lot 3 field investigation included soil borings, test pits and groundwater monitoring wells.

Figure 2-1 in Section 2.0 provides the surveyed locations of all completed sample locations along with the approximate locations of former MGP structures located on the site. Appendix C contains data tables summarizing the analytical results of all samples collected during the investigation. The sum total of all positively detected volatile organic compounds (VOCs), benzene, toluene, ethylbenzene, xylene (BTEX), semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs) and carcinogenic PAHs (CaPAHs) are also provided in the data summary tables.

The assessment of the presence of chemicals in the environment was performed using sample analytical results and physical descriptions of recovered sample media. In addition, the analytical results of the investigation were compared to NYSDEC regulatory standards, criteria and guidelines (SCGs) for *screening* purposes. The analytical data tables provided in Appendix C include a column for SCGs including those presented in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 Recommended Soil Cleanup

Objectives for soil dated January 24, 1994 (hereinafter referred to as RSCOs), and the Class GA groundwater standards and guidance values provided in the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 for groundwater (hereinafter referred to as NYSDEC groundwater standards). Concentrations of chemical constituents that exceed the SCGs are bracketed on the data tables.

The following terminology and descriptions were used to describe the visual and olfactory observations made during the field investigation, as well as to describe the nature of the observed materials.

- **Nonaqueous phase liquid (NAPL):** NAPL is a liquid that does not readily dissolve in water and can exist as a separate fluid phase. Tar and oil released in a soil/water environment will behave as NAPLs. NAPLs are subdivided into two types, those that are lighter than water (light nonaqueous phase liquid or LNAPL) and those with a density greater than water (dense nonaqueous phase liquid or DNAPL). Being lighter than water, LNAPLs will float on water. A common example of an LNAPL would be gasoline or oil floating on water. DNAPLs, being denser than water, would tend to sink through water. Though examples of DNAPLs in everyday life are not very common, an analogy to a DNAPL in water would be an oil and vinegar salad dressing where the vinegar represents the water. When the oil and vinegar mixture is shaken, it is momentarily mixed as an emulsion. However, after settling, the oil being lighter than the water/vinegar remains at the top of the container whereas the vinegar settles to the bottom.

- **Saturated:** The entire pore space of the soil matrix for a given soil sample was filled with a NAPL. The characteristics of the observed NAPL were used in the description (i.e., tar-saturated or petroleum-saturated).

- **Blebs:** Observed discrete sphericals or pockets of NAPL within a soil or groundwater sample. The characteristics of the observed NAPL were used in the description (i.e., tar blebs or petroleum blebs).

- **Stained:** The soil sample exhibited a discoloration not associated with natural processes. The color of the observed stain was used and if the characteristics of the staining material were discernible, they were also noted (i.e., tar-stained or petroleum-stained).

- **Sheen:** The iridescence observed within a soil sample or the surface of a groundwater sample created by the presence of small quantities of NAPL.

- **Odor:** If an odor was present, it was described based on its relative intensity and characteristics. Relative odor intensity was described using terms such as strong, moderate and faint. Descriptive terms such as tar-like, naphthalene-like or petroleum-like odors were also used when such determinations could be made.

- **Coal Tar:** Coal Tar is a byproduct of the manufactured gas process and is typically comprised of a broad spectrum of hydrocarbon compounds including BTEX compounds, PAHs and phenols. Coal tar can be encountered in a solid, semi-solid or liquid state. Similar to petroleum, coal tar does not readily dissolve in water and will exist as a NAPL when released in a soil/water environment.

BTEX compounds were the principal VOCs detected in samples and are the common VOCs associated with coal tar. SVOCs were also detected at the site with PAHs being the common subset of SVOCs in coal tar. For purposes of this report, PAHs include the compounds listed below.

- 2-Methylnaphthalene
- Benzo(b)fluoranthene
- Fluorene
- Acenaphthene
- Benzo(g,h,i)perylene
- Indeno(1,2,3-cd)pyrene
- Acenaphthylene
- Benzo(k)fluoranthene
- Naphthalene
- Anthracene
- Chrysene
- Phenanthrene
- Benzo(a)anthracene
- Dibenzo(a,h)anthracene
- Pyrene
- Benzo(a)pyrene
- Fluoranthene
- Dibenzofuran

Of these PAHs, the following are considered carcinogenic by USEPA.

- Benzo(a)anthracene
- Dibenzo(a,h)anthracene
- Benzo(a)pyrene
- Benzo(k)fluoranthene
- Indeno(1,2,3-cd)pyrene
- Benzo(b)fluoranthene
- Chrysene

4.2 Subsurface Soil

4.2.1 Tax Lot 1

Provided in Appendix C are the analytical results for subsurface soil samples. VOC results are summarized in Table 4, SVOC results are summarized in Table 5, and TAL metals and cyanide results are summarized in Table 6.

Volatile Organic Compounds (VOCs)

All of the subsurface soil samples selected for chemical analysis from the 11 soil boring locations advanced within Tax Lot 1 exhibited detectable levels of VOCs. In general, the highest total VOC concentrations were detected in samples that exhibited naphthalene and hydrocarbon-like odors, sheens and black tar staining. Additionally, these samples typically exhibited PID measurements in excess of 100 ppm. A review of the VOC data presented on Table 4 in Appendix C indicates that total VOCs exceed their respective RSCOs in 10 out of 22 samples. In almost all of the subsurface soil samples exhibiting detectable levels of VOCs, BTEX compounds were most predominant. Total xylene and benzene are the most frequently detected VOC compounds above their respective RSCO with 13 out of 22 samples and 10 out of 22 samples, respectively; whereas, toluene and ethylbenzene each exceed their RSCOs in only 8 out of 22 samples. Additionally, methylene chloride and 2-butanone each exceed their RSCOs in 5 out of 22 samples and acetone exceeded in 4 out of 22 samples. However, methylene chloride, 2-butanone and acetone are common laboratory contaminants and are not typically associated with MGP residuals, and therefore, it can be assumed that they are not attributable to site contamination.

Table 4-1 summarizes data related to subsurface soil samples collected from locations which exceeded RSCOs for total VOCs along with the approximate location of each sample in relation to former MGP structures/features. The table also includes PID measurements and indicates whether any physical evidence of saturated NAPL was noted in the samples.

TABLE 4-1
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY

TAX LOT 1 SUBSURFACE SOIL SAMPLES EXHIBITING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS THAT EXCEED NYSDEC SOIL CLEANUP OBJECTIVES*

Sample ID (Boring and Sample Depth)	Total VOC Concentration (mg/kg)	Location (in Relation to Former MGP Structure/Feature)	PID (ppm)	Evidence of NAPL at Saturated Conditions Noted in Sample
SB-24 (36-38)	5,930	Along eastern sidewalk of 12th Avenue, within northern most former coal pocket.	111	Yes
SB-24 (30-32)	4,020	Along eastern sidewalk of 12th Avenue, within northern most former coal pocket.	68.6	Yes
SB-19 (20-24)	1,267	Northern tip of stone dust walkway, within former MGP office area.	129	No
SB-23 (20-24)	579	Along eastern sidewalk of 12th Avenue, within former south coal pockets.	132	Yes
SB-18 (9-13)	177.4	Within the dog walk compound, along the eastern edge of the former Purifying House.	51	No
SB-08 (12-16)	91.8	Southern tip of stone dust walkway, within former Purifying House.	313	No
SB-24 (34-36)	76.4	Along eastern sidewalk of 12th Avenue, within northern most former coal pocket.	27.5	Yes
SB-26 (9-13)	62	Along southern sidewalk of 42nd Street, within northern most former condenser area.	130	No
SB-26 (16-19)	31.5	Along southern sidewalk of 42nd Street, within northern most former condenser area.	56	No
SB-22 (12-16)	18.6	Within the loading dock, within the vicinity of the former south coal pockets.	7.6	No

Note:
* Based on samples collected as part of the Site Characterization Study investigation.

Additionally, Figure 4-1 presents total VOC and total SVOC concentrations in subsurface soil within Tax Lot 1.

As shown in Table 4-1 the first, second and seventh highest total VOC concentrations of 5,930 mg/kg, 4,020 mg/kg and 76.4 mg/kg were detected at in borehole SB-24 in soil samples collected from 36-38 feet, 30-32 feet and 34-36 feet, respectively. In SB-24 (36-38 feet) and SB-24 (30-32 feet), methylene chloride, benzene, toluene, ethylbenzene and total xylene compounds exceeded their respective RSCOs, whereas SB-24 (34-36 feet), exceeded for toluene, ethylbenzene and total xylene. As shown on Figure 2-1, soil boring SB-24 was completed along the eastern sidewalk of 12th Avenue within the northernmost former coal pocket. While the greatest total VOC concentration was detected in the sample collected from the 36 to 38-foot interval, it is believed that the sample may have actually been impacted by a DNAPL source from the 30 to 32-foot interval due to the fact that the borehole appeared to be filling with a mobile DNAPL after drilling beyond 32 feet at SB-24. Therefore, the VOC concentrations detected at the 36 to 38-foot interval are likely biased high and do not accurately represent "true" VOC concentrations at this depth. Due to the infiltration of DNAPL into the borehole annulus, the borehole was terminated and grouted with a cement bentonite slurry. Further advancement was ceased to avoid vertical mobilization of DNAPL within the boring and penetrating the clay unit. The subsurface soil recovered from SB-24 at 30 to 32 feet bgs exhibited evidence of DNAPL at saturated levels, strong naphthalene-like odors, black tar staining and PID measurements of up to 68.6 ppm.

The third highest total VOC concentration of 1,267 mg/kg was detected in soil sample SB-19 (20-24 feet). Benzene, toluene, ethylbenzene and total xylene compounds exceeded their respective RSCO in this sample. This sample was collected from soil boring SB-19 located on the northern tip of the stone dust walkway within the landscaped area and within the boundary of the office building associated with the former MGP. The subsurface soil recovered at 20 to 24 feet bgs exhibited evidence of strong naphthalene-like odors, black tar staining and PID measurements of up to 129 ppm. However, VOC concentrations decreased with increasing depth at SB-19 with a total VOC concentration of 0.874 mg/kg observed in the sample collected at 24 to 26.2 feet bgs.

LEGEND:

- SB-01 ● SOIL BORING LOCATION
- TEST PIT LOCATION AND APPROXIMATE BOUNDARY
- MONITORING WELL LOCATION
- PREVIOUSLY INSTALLED WELL LOCATIONS SAMPLED AS PART OF THE SCS (LANGAN ENGINEERING WELLS)
- BLOCK 1089 — TAX BLOCK NUMBER
- (1) — TAX NUMBER FOR PARCELS WITHIN FORMER MGP
- TAX LOT BOUNDARY
- — X — FENCE
- FORMER MGP STRUCTURES
- BOUNDARY OF SITE CHARACTERIZATION STUDY AREA

SOIL BORING SAMPLES

SB-08		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
12 - 16	**91.80**	**1,835.70**
28 - 30	6.16	20 044

SB-20		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
12 - 16	0 052	56.50
16 - 20	3 318	15.059

SB-23		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
20 - 24	**579.00**	**6,658.40**
52 - 54 5	**1.44**	570.96

SB-26		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
9 - 13	**62.00**	**1,684.91**
16 - 19	**31.50**	**10,286.00**

SB-18		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
9 - 13	**177.40**	**1,844.20**
23 - 25	0.203	1.241

SB-21		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
12 - 16	0.063	218.40
36 - 38.9	0 047	33.233

SB-24		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
30 - 32	**4,020.00**	**167,800.00**
34 - 36	**76.40**	41 84
36 - 38	**5,930.00**	**264,460.00**

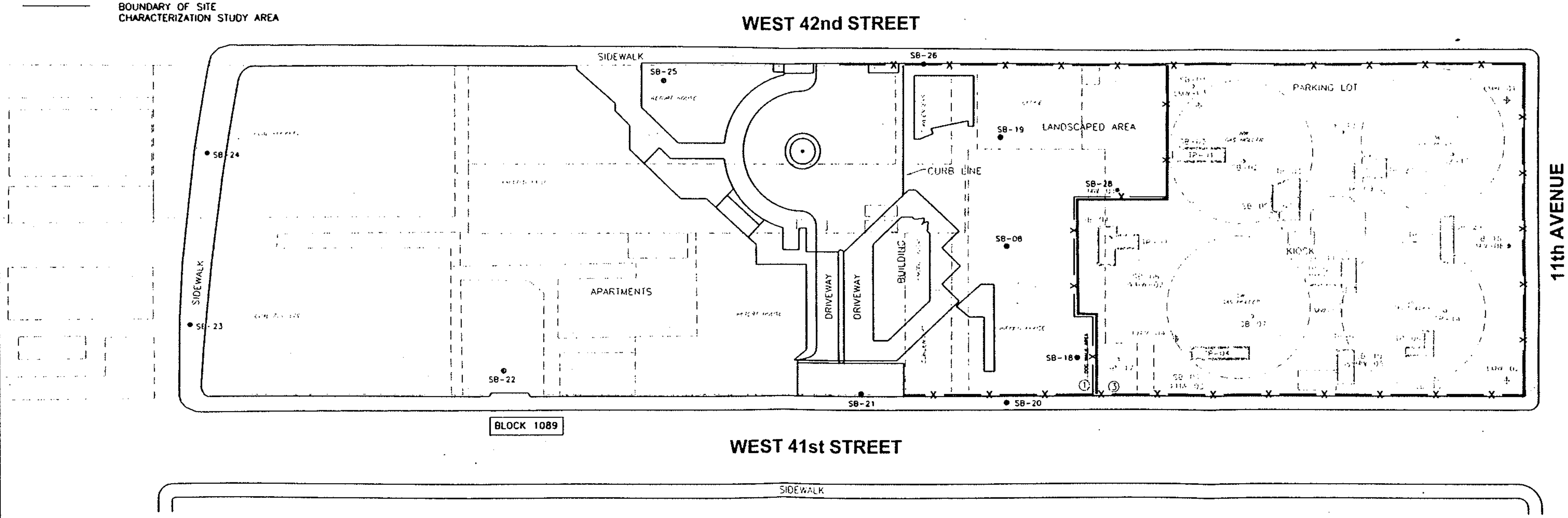
SB-28		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
11 - 13	0.147	0.056

SB-19		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
20 - 24	**1,267.00**	**5,189.80**
24 - 26.2	0.874	53.72

SB-22		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
12 - 16	**18.60**	173.166
36 - 44	1.222	3.982

SB-25		
Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
12 - 16	7 14	**769.10**
24 - 28	7 26	4.948

NOTE:
SHADED BOXES INDICATE TOTAL VOC AND TOTAL SVOC CONCENTRATIONS THAT EXCEED THE NYSDEC TAGM 4046 APPENDIX A RECOMMENDED SOIL CLEANUP OBJECTIVES OF 10 mg/Kg and 500 mg/Kg, RESPECTIVELY.



SOURCE: MAP PROVIDED BY CONSOLIDATED EDISON. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON INTERPRETATION OF SANBORN MAPS AND DRAWINGS PROVIDED BY CONSOLIDATED EDISON CONTAINED WITHIN THE WEST 42nd STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT BY PARSONS, DATED AUGUST 2002 AND THE RIVER PLACE PHASE II, 42nd. STREET AND ELEVENTH AVENUE, GEOTECHNICAL ENGINEERING STUDY BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C., DATED JULY 2000.

0 60
SCALE IN FEET

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

TOTAL VOC AND TOTAL SVOC SUBSURFACE SOIL ANALYTICAL DATA FOR TAX LOT 1

FIGURE 4-1

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The fourth highest total VOC concentration of 579 mg/kg was detected in soil sample SB-23 (20-24 feet). Benzene, toluene, ethylbenzene and total xylene compounds exceeded their respective RSCO in this sample. This sample was collected from soil boring SB-23 located along the eastern sidewalk of 12th Avenue within the southernmost former coal pocket. The subsurface soil recovered at 20 to 24 feet bgs exhibited a strong hydrocarbon-like odor, black tar staining and PID measurements up to 132 ppm. However, VOC concentrations decreased with increasing depth at SB-23 with a total VOC concentration of 1.436 mg/kg observed in the sample collected at 52 to 54.5 feet bgs.

The fifth and sixth highest total VOC concentrations of 177.4 mg/kg and 91.8 mg/kg were detected in soil samples SB-18 (9-13 feet) and SB-08 (12-16 feet), respectively. In SB-18 (9-13 feet), benzene, toluene, ethylbenzene and total xylene compounds exceeded their respective RSCOs, whereas SB-08 (12-16 feet) exceeded for methylene chloride, toluene, ethylbenzene and total xylene. Soil borings SB-18 and SB-08 were completed within the vicinity of the former Purifying House. The referenced soil samples exhibited strong naphthalene-like odors and PID measurements up to 177.4 ppm. However, VOC concentrations decreased with increasing depth with total VOC concentrations of 0.203 mg/kg and 6.16 mg/kg observed in soil samples SB-18 (23-25 feet) and SB-08 (28-30 feet), respectively.

The eighth and ninth highest total VOC concentrations of 62 mg/kg and 31.5 mg/kg were detected in borehole SB-26 from (9-13 feet) and (16-19 feet), respectively. In SB-26 (9-13 feet), ethylbenzene and total xylene compounds exceeded their respective RSCOs, whereas SB-26 (16-19 feet), exceeded for benzene, toluene and total xylene. Soil boring SB-26 was completed along the southern sidewalk of 42nd street, within the vicinity of the northernmost former condenser. The subsurface soil observed in this boring exhibited strong naphthalene-like and hydrocarbon-like odors, black tar staining, a sheen and PID measurements up to 130 ppm. It is worthy to note that the 16-19 foot sample was collected below the water table and just above the bedrock due to the fact that bedrock is relatively shallow in this area of Tax Lot 1.

The tenth highest total VOC concentration of 18.6 mg/kg was detected in soil sample SB-22 (12-16 feet). In SB-22 (12-16 feet), benzene and total xylene compounds exceeded their respective RSCOs. Soil boring SB-22 was completed within the apartment building's loading dock, within the vicinity of the southernmost former coal pockets. The referenced soil sample exhibited strong naphthalene-like odors, black tar staining, a sheen and PID measurements up to 7.6 ppm. However, VOC concentrations decreased with increasing depth with a total VOC concentration of 1.222 mg/kg observed in soil sample SB-22 (36-44 feet).

As illustrated by Figure 4-1, the highest VOC concentrations detected in subsurface soil within Tax Lot 1 were generally observed in samples collected from a depth of 9 to 24 feet bgs and within the Fill Unit, which is described in Section 3.2.1. However, at most locations, VOC concentrations decrease rapidly below this depth. This is likely due to the confining ability of the Clay Unit (described in Section 3.2.2), which directly underlies the Fill Unit. Exceptions to this general trend include borings SB-23 and SB-24 where elevated VOC concentrations were observed at depths of up to 38 feet, and within the Clay Unit.

Semi-Volatile Organic Compounds (SVOCs)

All of the subsurface soil samples selected for chemical analysis from the 11 soil boring locations advanced within Tax Lot 1 exhibited detectable levels of SVOCs. In general, the highest total SVOCs were detected in samples that exhibited naphthalene/hydrocarbon-like odors, sheens and black tar staining. In almost all of the subsurface soil samples exhibiting detectable levels of SVOCs, PAH compounds were most predominant. A review of the SVOC concentrations presented on Table 5 in Appendix C indicates that the following SVOCs were the most frequent compounds to exceed their respective RSCO: benzo(a)pyrene (17 out of 22 samples), dibenzo(a,h)anthracene (16 out of 22 samples), benzo(b)fluoranthene (16 out of 22 samples), benzo(a)anthracene (15 out of 22 samples), chrysene (15 out of 22 samples) and naphthalene (13 out of 22 samples).

Table 4-2 summarizes data related to subsurface soil samples collected from locations, which exceeded RSCOs for total SVOCs along with the approximate location of each sample in relation to former MGP structures/features. The table also includes PID measurements and indicates whether any physical evidence of saturated NAPL was noted in the samples. Additionally, Figure 4-1 presents total VOC and total SVOC concentrations in subsurface soil within Tax Lot 1.

As shown on Table 4-2 and Figure 4-1, the maximum total SVOC concentration observed in subsurface soil within Tax Lot 1 was 264,460 mg/kg detected in soil sample SB-24 (36-38 feet). More than 20 percent (or 56,000 mg/kg out of 264,460 mg/kg) of the total SVOC concentration in this sample was comprised of naphthalene. The second highest total SVOC concentration of 167,800 mg/kg was detected within the same borehole from 30-32 feet bgs. In both samples, 18 out of 64 SVOC compounds analyzed exceeded their respective RSCO, all of which being PAHs. As discussed previously, soil boring SB-24 was completed along the eastern sidewalk of 12th Avenue within the northernmost former coal pocket. It is believed that subsurface soil sample SB-24 (36-38 feet) was impacted by a DNAPL source from the 30 to 32-foot interval. Therefore, while this sample exhibits the greatest total SVOC concentration within Tax Lot 1, it is likely biased high due to the infiltration of the DNAPL and does not represent "true" total SVOC concentrations at this depth. The subsurface soil recovered from SB-24 at 30 to 32 feet bgs exhibited evidence of DNAPL, strong naphthalene-like odors, black tar staining and PID measurements of up to 68.6 ppm.

The third highest total SVOC concentration of 10,286 mg/kg was detected in subsurface soil sample SB-26 (16-19 feet). Seventeen out of 64 compounds analyzed exceeded their respective RSCO in this sample, all of which being PAHs. Soil boring SB-26 was completed along the southern sidewalk of 42nd Street, within the vicinity of the northernmost former condenser. The subsurface soil recovered at 16 to 19 feet bgs exhibited strong naphthalene-like and hydrocarbon-like odors, black tar staining, a sheen and PID measurements of up to 56 ppm. It is worthy to note that this sample was collected below the water table and just above bedrock due to the fact that bedrock is relatively shallow in this area of Tax Lot 1.

TABLE 4-2
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY

TAX LOT 1 SUBSURFACE SOIL SAMPLES EXHIBITING TOTAL SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS THAT EXCEED NYSDEC SOIL CLEANUP OBJECTIVES*

Sample ID (Boring and Sample Depth)	Total SVOC Concentration (mg/kg)	Location (in Relation to Former MGP Structure/Feature)	PID (ppm)	Evidence of NAPL at Saturated Conditions Noted in Sample
SB-24 (36-38)	264,460	Along eastern sidewalk of 12th Avenue, within northern most former coal pocket.	111	Yes
SB-24 (30-32)	167,800	Along eastern sidewalk of 12th Avenue, within northern most former coal pocket.	68.6	Yes
SB-26 (16-19)	10,286	Along southern sidewalk of 42nd Street, within northern most former condenser area.	56	No
SB-23 (20-24)	6,658.40	Along eastern sidewalk of 12th Avenue, within southern most former coal pocket.	132	No
SB-19 (20-24)	5,189.80	Northern tip of stone dust walkway, within former MGP office area.	129	No
SB-18 (9-13)	1,844.20	Within the dog walk compound, along the eastern edge of the former Purifying House.	51	No
SB-08 (12-16)	1,835.70	Southern tip of stone dust walkway, within former Purifying House.	313	No
SB-26 (9-13)	1,684.91	Along southern sidewalk of 42nd Street, within northern most former condenser area.	130	No
SB-25 (12-16)	769.1	Along southern sidewalk of 42nd Street, within northern most former Retort House.	14.5	No
SB-23 (52-54.5)	570.96	Along eastern sidewalk of 12th Avenue, within southern most former coal pocket.	41.1	Yes

Note:
* Based on samples collected as part of the Site Characterization Study investigation.

The fourth highest total SVOC concentration of 6,658.4 mg/kg was detected in subsurface soil sample SB-23 (20-24 feet). Eighteen out of 64 SVOC compounds analyzed exceeded their respective RSCO in this sample, all of which being PAHs. Soil boring SB-23 was completed along the eastern sidewalk of 12th Avenue, within the southernmost former coal pocket. The subsurface soil recovered at 20 to 24 feet bgs in this sample exhibited strong hydrocarbon-like odors, black tar staining and PID measurements of up to 132 ppm, and was collected at or just above the Clay Unit. However, SVOC concentrations decreased with increasing depth at this location with a total SVOC concentration of 570.96 mg/kg observed in the sample collected at 52-54.4 feet bgs.

The fifth highest total SVOC concentration of 5,189.8 mg/kg was detected in soil sample SB-19 (20-24 feet). Eighteen out of 64 SVOC compounds analyzed exceeded their respective RSCO in this sample, all of which being PAHs. Soil boring SB-19 was completed on the northern tip of the stone-dust walkway, within the former MGP office area. The subsurface soil recovered at 20 to 24 feet bgs exhibited strong naphthalene-like odors, black tar staining, blebs, sheen and PID measurements of up to 129 ppm, and was collected at or just above the Clay Unit. However, SVOC concentrations decreased rapidly with increasing depth with a total SVOC concentration of 53.72 mg/kg observed in the sample collected at 24-26.2 feet bgs.

As illustrated by Figure 4-1 and consistent with the distribution of VOCs, the highest SVOC concentrations detected in subsurface soil within Tax Lot 1 were observed in samples collected from a depth of 9 to 24 feet bgs, and within the Fill Unit. However, at most locations, SVOC concentrations decrease rapidly below this depth. This rapid decrease in SVOC concentrations is likely due to the confining ability of the underlying Clay Unit. Exceptions to this general trend include borings SB-23 and SB-24 where elevated SVOC concentrations were observed to a depth of up to 38 feet, and within the Clay Unit.

TAL Metals and Cyanide

TAL metals detected in subsurface soil samples selected for chemical analysis from Tax Lot 1 have been compared to RSCOs and are provided in Appendix C on Table 6. Total cyanide

was observed at detectable concentrations in 14 out of the 22 subsurface soil samples. The ranges of TAL metal and total cyanide concentrations in the subsurface soil samples on Tax Lot 1 are summarized in Table 4-3.

As shown on Table 4-3, the highest concentrations of lead, mercury and total cyanide were found in sample SB-08 (12-16 feet). Soil boring SB-08 was advanced in the central portion of the landscaped area in the vicinity of the former Purifying House. Soil recovered at this boring from 12 to 16 feet bgs consisted of a black tar stained sand with a sheen and a strong naphthalene-like odor. TAL metals that were most frequently detected in excess of RSCOs included iron (21 out of 22 soil samples collected), zinc (20 out of 22 soil samples collected) and chromium (19 out of 22 soil samples collected).

4.2.2 Tax Lot 3

Provided in Appendix C are the analytical results for subsurface soil samples. VOC results are summarized in Table 1 for test pits and Table 4 for soil borings. SVOC results are summarized in Table 2 for test pits and Table 5 for soil borings. TAL metals and cyanide results are summarized in Table 3 for test pits and Table 6 for soil borings.

Volatile Organic Compounds (VOCs)

All of the subsurface soil samples selected for chemical analysis from the 18 soil boring locations and 9 test pit locations advanced within Tax Lot 3 exhibited detectable levels of VOCs. In general, the highest total VOC concentrations were detected in samples that exhibited naphthalene/hydrocarbon-like odors, sheens and black tar staining. Additionally, these samples typically exhibited PID measurements in excess of 100 ppm. A review of VOC data presented on Table 1 and Table 4 in Appendix C indicates that total VOCs exceed their respective RSCOs in

TABLE 4-3
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY

TAX LOT 1 SUBSURFACE SOIL SAMPLES EXHIBITING TAL METALS AND TOTAL CYANIDE CONCENTRATIONS THAT EXCEED NYSDEC SOIL CLEANUP OBJECTIVES*

Constituents with RSCO Exceedances	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives (mg/kg)	Concentration Range	Frequency of Exceeding Soil Cleanup Objectives	Sample Exhibiting Maximum Concentration
Arsenic	7.5 or SB	2.1 to 24.2 mg/kg	9 of 22	SB-22 (12-16)
Beryllium	0.16 or SB	ND to 0.96 mg/kg	15 of 22	SB-18 (23-25)
Cadmium	10[1]	ND to 5.1 mg/kg	8 of 22	SB-24 (30-32)
Chromium	50[1]	0.86 to 65.8 mg/kg	19 of 22	SB-24 (30-32)
Copper	25 or SB	0.94 to 99.1 mg/kg	10 of 22	SB-22 (12-16)
Iron	2,000 or SB	987 to 92,900 mg/kg	21 of 22	SB-24 (30-32)
Lead	400	2.9 to 841 mg/kg	2 of 22	SB-08 (12-16)
Mercury	0.1	ND to 3.2 mg/kg	12 of 22	SB-08 (12-16)
Nickel	13 or SB	0.79 to 24.8 mg/kg	17 of 22	SB-18 (23-25)
Selenium	2 or SB	ND to 6.8 mg/kg	19 of 22	SB-22 (12-16)
Zinc	20 or SB	4.2 to 136 mg/kg	20 of 22	SB-22 (12-16)
Total Cyanide	----	ND to 126 mg/kg	NA	SB-08 (12-16)

Notes:
* Based on samples collected as part of the Site Characterization Study investigation.
SB: Site background
----: not established
[1]: As per proposed 4/95 NYSDEC TAGM
NA: Not applicable

11 out of 39 samples. In almost all of the subsurface soil samples exhibiting detectable levels of VOCs, BTEX compounds were most predominant. Benzene and total xylene are the most frequently detected VOC compounds above their respective RSCO. Benzene exceeded the RSCOs in 10 out of 39 samples and total xylene in 9 out of 39 samples; whereas, both toluene and ethylbenzene exceed their RSCOs in only 4 out of 39 soil samples. Additionally, methylene chloride exceeded its RSCO in 3 out of 39 samples. However, methylene chloride is a common laboratory contaminant and is not typically associated with MGP residuals and, therefore, it can be assumed that it is not attributable to site contamination.

Table 4-4 summarizes data related to subsurface soil samples collected from locations, which exceeded RSCOs for total VOCs along with the approximate location of each sample in relation to former MGP structures/features. The table also includes PID measurements and indicates whether any physical evidence of saturated NAPL was noted in the samples. Additionally, Figure 4-2 presents total VOC and total SVOC concentrations in subsurface soil within Tax Lot 3.

As shown in Table 4-4, the first and fifth highest total VOC concentrations of 865 mg/kg and 74.3 mg/kg were detected in soil samples SB-29 (19-23 feet) and SB-16 (13-15 feet), respectively. Toluene, ethylbenzene and total xylene exceeded RSCOs in SB-29 (19-23 feet); whereas, in SB-16 (13-15 feet), only ethylbenzene exceeded its respective RSCO. Soil borings SB-29 and SB-16 were completed along the eastern edge of Tax Lot 3, within the vicinity of the former northeast (NE) and SE gas holders. Each subsurface soil sample exhibited strong naphthalene/hydrocarbon-like odors, black tar staining and PID measurements up to 801 ppm. However, VOC concentrations decreased with increasing depth with total VOC concentrations of 0.032 mg/kg and 0.304 mg/kg observed in soil samples SB-29 (39-41 feet) and SB-16 (25-27 feet), respectively.

The second, third and fifth highest total VOC concentrations of 410.7 mg/kg, 242.4 mg/kg and 35.1 mg/kg were detected in soil samples SB-02 (17-19 feet), SB-05 (18-19.5 feet) and SB-03 (17-19 feet), respectively. In SB-02 (17-19 feet), benzene and total xylene exceeded RSCOs, whereas SB-03 (17-19 feet), exceeded for benzene, toluene

TABLE 4-4
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY

TAX LOT 3 SUBSURFACE SOIL SAMPLES EXHIBITING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS THAT EXCEED NYSDEC SOIL CLEANUP OBJECTIVES*

Sample ID (Boring and Sample Depth)	Total VOC Concentration (mg/kg)	Location (in Relation to Former MGP Structure/Feature)	PID (ppm)	Evidence of NAPL at Saturated Conditions Noted in Sample
SB-29 (19-23)	865	Along eastern edge of the site, in-between the northeast and southeast former MGP gas holders.	801	No
SB-02 (17-19)	410.7	Within former northwest gas holder.	800	No
SB-05 (18-19.5)	242.4	Within former northwest gas holder.	299	No
SB-13 (19-21.4)	78.3	Within former southeast gas holder.	1186	No
SB-16 (13-15)	74.3	Along eastern edge of the site, sidegradient of the northeast and southeast former MGP gas holders.	104	No
SB-27 (29-31)	36.9	Within former northeast gas holder.	85	No
SB-03 (17-19)	35.1	Within former northwest gas holder.	1440	No
SB-15 (7-9)	28.468	Within former northeast gas holder.	1787	No
SB-27 (18-20)	27.5	Within former northeast gas holder.	145	No
TP-08 (10.5-11)	17	Along eastern edge of the site, in-between the northeast and southeast former MGP gas holders.	99	No
SB-14 (17-19)	12.626	Within former southeast gas holder.	70	No

Note:
* Based on samples collected as part of the Site Characterization Study investigation.

TEST PIT AND SOIL BORING SAMPLES

LEGEND

- SB-01 ● SOIL BORING LOCATION
- TP-01 TEST PIT LOCATION AND APPROXIMATE BOUNDARY
- MW-1 ⊗ MONITORING WELL LOCATION
- LMW-01 ⊕ PREVIOUSLY INSTALLED WELL LOCATIONS SAMPLED AS PART OF THE SCS (LANGAN ENGINEERING WELLS)
- BLOCK 1089 TAX BLOCK NUMBER
- ① TAX NUMBER FOR PARCELS WITHIN FORMER MGP
- TAX LOT BOUNDARY
- —— X —— FENCE
- FORMER MGP STRUCTURES
- BOUNDARY OF SITE CHARACTERIZATION STUDY AREA

TP-01

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
5 - 5.5	0.014	35.51 -

TP-02

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
9 - 9.5	3.9	12,010

TP-03

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
3.5 - 4	0.015	50.3

TP-04

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
8 - 8.5	0.151	8,012

TP-05

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
11 - 11.5	0.292	98,345

TP-06

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
9.5 - 10	0.03	1,497

TP-07

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
10 - 10.5	0.128	4

TP-08

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
10.5 - 11	16.96	92,847

TP-09

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
10 - 10.5	0.006	5,203

SB-01

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
22 - 26	0.804	60.17
28 - 32	0.019	29.19

SB-02

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
17 - 19	411	3,256
29 - 31	0.066	0.341

SB-03

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
17 - 19	36	1,648

SB-04

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
10 - 18	0.068	33.443

SB-05

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
18 - 19.5	242	7,502

SB-06

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
9 - 11	0.094	1.71

SB-07

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
27 - 29	0.907	5.316
33 - 35	0.04	87.053

SB-09

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
11 - 15	0.053	8.696
31 - 33.5	0.104	4.9

SB-10

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
20 - 24	0.261	0.92
26 - 28	0.06	0.276

SB-11

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
10 - 12	0.016	1.9

SB-12

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
21 - 23	2.65	45.217
27 - 28.8	0.792	1.01

SB-13

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
19 - 21.4	78	34,262

SB-14

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
17 - 19	13	31.452
30 - 32	0.017	0.13

SB-15

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
7.9	28	3,697
13 - 15	0.033	1.1

SB-16

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
13 - 15	74	53.45
25 - 27	0.304	2.297

SB-17

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
9 - 13	0.408	884
21 - 23	0.028	0.808

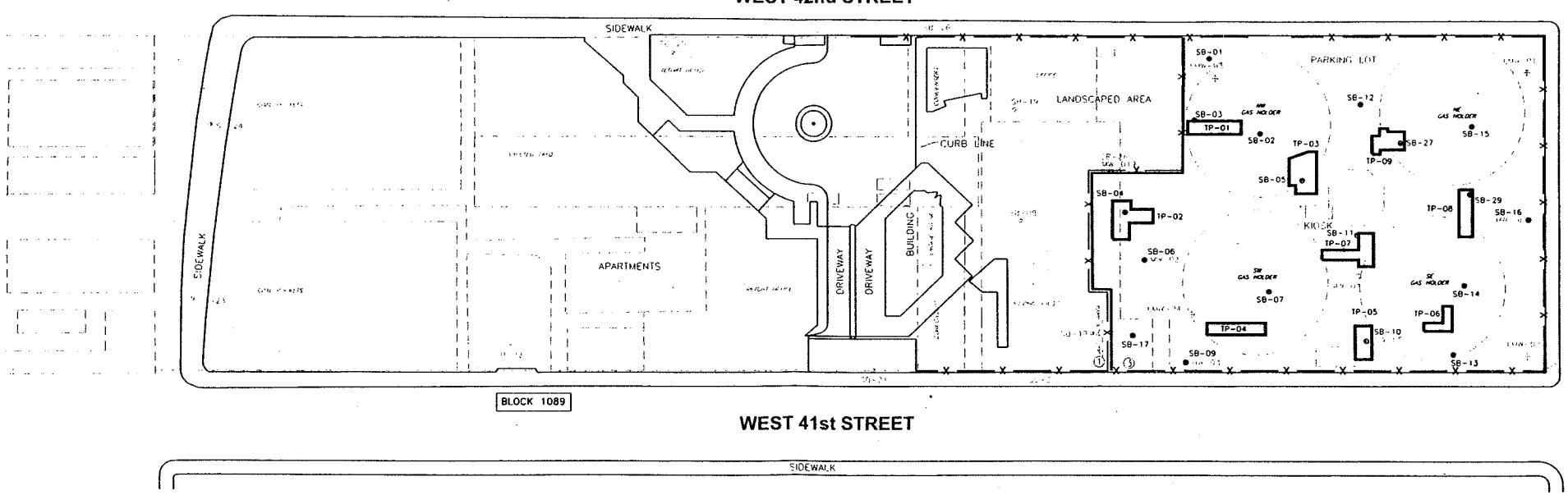
SB-27

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
18 - 20	28	832
29 - 31	37	69,327

SB-29

Depth Feet	Total VOC mg/kg	Total SVOC mg/kg
19 - 23	965	259.09
39 - 41	0.032	1.13

NOTE:
SHADED BOXES INDICATE TOTAL VOC AND TOTAL SVOC CONCENTRATIONS THAT EXCEED THE NYSDEC TAGM 4046 APPENDIX A RECOMMENDED SOIL CLEANUP OBJECTIVES OF 10 mg/Kg and 500 mg/Kg, RESPECTIVELY.



SOURCE: MAP PROVIDED BY CONSOLIDATED EDISON. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON INTERPRETATION OF SANBORN MAPS AND DRAWINGS PROVIDED BY CONSOLIDATED EDISON CONTAINED WITHIN THE WEST 42nd STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT BY PARSONS, DATED AUGUST 2002 AND THE RIVER PLACE PHASE II, 42nd. STREET AND ELEVENTH AVENUE, GEOTECHNICAL ENGINEERING STUDY BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C., DATED JULY 2000.

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Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

TOTAL VOC AND TOTAL SVOC SUBSURFACE SOIL ANALYTICAL DATA FOR TAX LOT 3

FIGURE 4-2

and total xylene and SB-05 (18-19.5 feet), exceeded for all four BTEX compounds. Soil borings SB-02, SB-03 and SB-05 were completed within the former northwest (NW) gas holder and the three referenced soil samples were collected directly above the former gas holder foundation. Each soil sample exhibited a slight to moderate naphthalene-like odor, black tar staining and PID measurements up to 1,440 ppm. However, no VOC compounds exceeded their respective RSCOs in soil sample SB-02 (29-31 feet) collected below the holder foundation.

The fourth highest total VOC concentration of 78.3 mg/kg was detected in soil sample SB-13 (19-21.4 feet). In SB-13 (19-21.4 feet), benzene, toluene and total xylene exceeded RSCOs. Soil boring SB-13 was completed within the former southeast gas holder and the referenced soil samples were collected directly above the former gas holder foundation. This soil sample exhibited a slight naphthalene-like odor, black tar staining and PID measurements up to 1,186 ppm.

The sixth, eighth, ninth and tenth highest total VOC concentrations of 36.9 mg/kg, 28.468 mg/kg, 27.5 mg/kg and 17 mg/kg were detected in soil samples SB-27 (29-31 feet), SB-15 (7-9 feet), SB-27 (18-20 feet) and TP-08 (10.5-11 feet), respectively. In SB-27 (29-31 feet), toluene, ethylbenzene and total xylene compounds exceeded their respective RSCOs; whereas, SB-27 (18-20 feet) and TP-08 (10.5-11 feet) exceeded for only total xylene. Although SB-15 (7-9 feet) exhibited detectable levels of VOCs, no compounds exceeded their respective RSCOs. The referenced soil borings were completed within the northeast former gas holder. The referenced soil samples exhibited strong naphthalene-like and hydrocarbon-like odors, a sheen and PID measurements up to 1,787 ppm.

The eleventh highest total VOC concentration of 12.6 mg/kg was detected in soil sample SB-14 (17-19 feet). In SB-14 (17-19 feet), benzene and total xylene compounds exceeded their respective RSCOs. Soil boring SB-14 was completed within the southeast former gas holder. The subsurface soil observed in this boring exhibited slight to strong naphthalene-like odor and PID measurements up to 12.6 ppm. However, VOC concentrations decreased with increasing depth with a total VOC concentration of 0.017 mg/kg observed in soil sample SB-14 (30-32 feet).

As shown on Figure 4-2, the highest VOC concentrations were detected in the Fill Unit at depths ranging from 17 to 23 feet bgs, and within and adjacent to the former gas holders. Furthermore, the samples exhibiting the highest VOC concentrations were collected from immediately above the former holder bottom foundations or, in the case of SB-29 (19-23 feet), immediately outside of the former holder bottoms. However, below a depth of 25 feet, VOC concentrations appear to decrease rapidly, which is likely due to the confining ability of the Clay Unit underlying the Fill Unit.

Figure 4-2 illustrates that the majority of subsurface soil samples selected for laboratory analysis at depths shallower that 16 feet bgs exhibit total VOC concentrations ranging from non-detectable to less than 1.0 mg/kg. Two exceptions to this general observation include TP-08 (10.5-11 feet) and SB-16 (13-15 feet), which exhibited total VOC concentrations of 22.86 and 74.3 mg/kg, respectively.

Semi-Volatile Organic Compounds (SVOCs)

All of the subsurface soil samples selected for chemical analysis from the 18 soil boring locations and 9 test pit locations advanced within Tax Lot 3 exhibited detectable levels of SVOCs. In general, the highest total SVOCs were detected in samples that exhibited naphthalene/hydrocarbon-like odors, sheens and black tar staining. In almost all of the subsurface soil samples exhibiting detectable levels of SVOCs, PAH compounds were most predominant. A review of the SVOC concentrations presented on Table 2 and 5 in Appendix C indicates the following SVOCs were the most frequent compounds to exceed their respective RSCO: benzo(a)pyrene (25 out of 39 samples), benzo(a)anthracene (20 out of 39 samples), chrysene (18 out of 39 samples), naphthalene (14 out of 39 samples), benzo(b)fluoranthene (11 out of 39 samples), dibenzo(a,h anthracene (9 out of 39 samples) and benzo(k)fluoranthene (9 out of 39 samples).

Table 4-5 summarizes data related to subsurface soil samples collected from locations which exceeded RSCOs for total SVOCs along with the approximate location of each sample in

TABLE 4-5
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY

TAX LOT 3 SUBSURFACE SOIL SAMPLES EXHIBITING TOTAL SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS THAT EXCEED NYSDEC SOIL CLEANUP OBJECTIVES*

Sample ID (Boring and Sample Depth)	Total SVOC Concentration (mg/kg)	Location (in Relation to Former MGP Structure/Feature)	PID (ppm)	Evidence of NAPL at Saturated Conditions Noted in Sample
TP-02 (9-9.5)	12,010	Within former Purifying House foundation walls.	11.9	No
SB-05 (18-19.5)	7,502	Within former northwest gas holder.	299	No
SB-02 (17-19)	3,255.9	Within former northwest gas holder.	800	No
SB-03 (17-19)	1,597.5	Within former northwest gas holder.	1440	No
SB-27 (18-20)	832.1	Within former northeast gas holder.	145	No
SB-17 (9-13)	583.6	Along the western edge of the site, in the vicinity of the Former Purifying House.	5.4	No

Note:
* Based on samples collected as part of the Site Characterization Study investigation.

relation to former MGP structures/features. The table also includes PID measurements and indicates whether any physical evidence of saturated NAPL was noted in the samples. Additionally, Figure 4-2 presents total VOC and total SVOC concentrations in subsurface soil within Tax Lot 3.

As shown on Table 4-5, the highest and sixth highest total SVOC concentrations of 12,010 mg/kg and 583.6 mg/kg were detected in soil samples TP-02 (9-9.5 feet) and SB-17 (9-13 feet), respectively. Eighteen out of 64 SVOC compounds analyzed exceeded their respective RSCO in sample TP-02 (9-9.5 feet), all of which being PAHs; whereas, SB-17 (9-13 feet) exhibited exceedances for 11 out of the 64 SVOC compounds analyzed. The sample collected from test pit TP-02 was from soil situated between the two parallel eastern former Purifying House walls as described in Section 3.2.1. Similarly, soil sample SB-17 (9-13 feet) was collected within the southeastern wall of the former Purifying House. Both subsurface soil samples exhibited slight to moderate naphthalene/hydrocarbon-like odors, black tar staining and PID measurements up to 11.9 ppm. However, SVOC concentrations appear to decrease with increasing depth with a total SVOC concentration of 33.443 mg/kg observed in adjacent soil boring SB-04 at a depth of 10 to 16 feet bgs and a total SVOC concentration of 0.806 mg/kg observed in soil boring SB-17 at a depth of 21 to 23 feet bgs.

The second, third and fourth highest total SVOC concentrations of 7,502 mg/kg, 3,255.9 mg/kg and 1,597.5 mg/kg were detected in soil samples SB-05 (18-19.5 feet), SB-02 (17-19 feet) and SB-03 (17-19 feet), respectively. SB-05 (18-19.5 feet) exhibited exceedances of RSCOs for 13 out of the 64 SVOC compounds analyzed; whereas, SB-02 (17-19 feet), exhibited exceedances for 9 out of the 64 SVOC compounds analyzed and SB-03 (17-19 feet) for 11 out of the 64 SVOC compounds analyzed. These three soil borings were completed within the former NW gas holder. All three subsurface soil samples were collected directly above the former gas holder foundation and exhibited a slight to moderate naphthalene-like odor, black tar staining and PID measurements up to 1,440 ppm. However, SVOC compounds appear to decrease with increasing depth with a total SVOC concentration of 0.341 mg/kg observed in soil sample SB-02 (29-31 feet) collected below the holder foundation.

The fifth highest total SVOC concentration of 832.081 mg/kg was detected in subsurface soil sample SB-27 (18-20 feet). Naphthalene, 2-Methylnaphthalene and benzo(a)pyrene were the only SVOC compounds to exceed their respective RSCOs in this sample. Soil boring SB-27 was completed within the former NE gas holder. SB-27 (18-20 feet) was collected directly above the former gas holder foundation and exhibited a strong naphthalene-like odor and PID measurements up to 145 ppm. However, SVOC concentrations appear to decrease with increasing depth with a total SVOC concentration of 89.327 mg/kg observed at a depth of 29 to 31 feet bgs.

As shown on Figure 4-2 and consistent with the VOC results, the SVOC data indicates that the highest SVOC concentrations were generally observed in samples collected from the Fill Unit at depths ranging from 17 to 23 feet and within and adjacent to the former gas holder foundations on Tax Lot 3. Additionally, SVOC data from test pit location TP-02 indicates that elevated SVOC concentrations were also observed within the vicinity of the former Purifying House at a depth of 9 to 10 feet bgs. As with VOC, SVOC concentrations generally decreased in subsurface soil with increasing depth even in the areas where the highest levels of SVOCs were detected.

TAL Metals and Cyanide

TAL metals detected in subsurface soil samples on Tax Lot 3 were compared to RSCOs and have been provided on Table 3 for test pits and Table 6 for soil borings in Appendix C. Total cyanide was observed at detectable concentrations in 28 out of the 39 subsurface soil samples selected for analysis. The ranges of TAL metal and total cyanide concentrations in the subsurface soil samples are summarized in Table 4-6.

As shown on Table 4-6, the highest concentrations of mercury were detected in samples SB-04 (10-16 feet) and TP-02 (9-9.5 feet), at 1.8 mg/kg and 22 mg/kg, respectively. Both SB-04 and TP-02 were advanced along the easternmost wall of the Purifying House. Soil recovered from 9 to 16 feet bgs consisted of a black stained sand with sheens and strong naphthalene-like odors. In addition, the two referenced samples exhibited lead at 390 mg/kg and 247 mg/kg.

TABLE 4-6
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY

TAX LOT 3 SUBSURFACE SOIL SAMPLES EXHIBITING TAL METALS AND TOTAL CYANIDE CONCENTRATIONS THAT EXCEED NYSDEC SOIL CLEANUP OBJECTIVES*

Constituents with RSCO Exceedances	NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives (mg/kg)	Concentration Range	Frequency of Exceeding Soil Cleanup Objectives	Sample Exhibiting Maximum Concentration
Arsenic	7.5 or SB	ND to 35.6 mg/kg	5 of 39	TP-02 (9-9.5)
Beryllium	0.16 or SB	ND to 1.8 mg/kg	37 of 39	SB-01 (22-26)
Chromium	50[1]	9.8 to 79.1 mg/kg	29 of 39	SB-07 (33-35)
Copper	25 or SB	8.5 to 77.5 mg/kg	17 of 39	TP-01 (5-5.5)
Iron	2,000 or SB	7,560 to 94,900 mg/kg	39 of 39	TP-02 (9-9.5)
Mercury	0.1	ND to 22.2 mg/kg	23 of 39	TP-02 (9-9.5)
Nickel	13 or SB	0.79 to 27.3 mg/kg	27 of 39	TP-03 (3.5-4)
Vanadium	150 or SB	13 to 197 mg/kg	2 of 39	SB-07 (33-35)
Zinc	20 or SB	22.0 to 220 mg/kg	39 of 39	TP-01 (5-5.5)
Total Cyanide	----	ND to 1,580 mg/kg	NA	SB-17 (9-13)

Notes:
* Based on samples collected as part of the Site Characterization Study investigation.
SB: Site background
----: not established
[1]: As per proposed 4/95 NYSDEC TAGM
NA: Not applicable

However, these concentrations are below the lead RSCO of 400 mg/kg. TAL metals that were most frequently detected in excess of RSCOs included iron (39 out of 39 soil samples collected), zinc (39 out of 39 soil samples collected) and beryllium (37 out of 39 soil samples collected). A maximum total cyanide concentration of 1,580 mg/kg was detected in subsurface soil sample SB-17 (9 to 13 feet). Soil boring SB-17 was completed approximately 20 feet east of the former Purifying House. Total cyanide compounds are commonly found in purifier or oxide box wastes generated through the purification of the manufactured gas.

4.3 Groundwater

Groundwater quality within Tax Lot 3 was characterized through the collection and analysis of groundwater samples collected from 4 existing groundwater monitoring wells and 6 newly installed groundwater monitoring wells. All new and existing monitoring wells were sampled in October 2003.

VOC and SVOC results for groundwater samples collected from groundwater monitoring wells are summarized in Appendix C on Table 7 and Table 8, respectively. TAL metals and total cyanide results are presented in Table 9.

The following discussion presents the findings of the groundwater sampling completed as part of the SCS field investigation.

Volatile Organic Compounds (VOCs)

All 10 groundwater samples collected from the groundwater monitoring wells exhibited detectable levels of VOCs. In almost all of the groundwater samples exhibiting detectable levels of VOCs, BTEX compounds were the most predominant compounds detected with BTEX comprising approximately 80% of the total VOC in all samples. A review of the VOC data presented on Table 7 in Appendix C indicates benzene and ethylbenzene are the most frequently detected VOC compounds above their respective NYSDEC groundwater standard, with 9 out of 10 samples and 6 out of 10 samples, respectively; whereas, total xylene and isopropylbenzene

each exceed their standards in 5 out of 10 samples. Additionally, toluene, 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene each exceeded their standards in 4 out of 10 samples; whereas, n-propylbenzene exceeded its standard in 3 out of 10 samples. Methyl tert-butyl ether exceeded its standard in 2 out of 10 samples; whereas, 1,2 dichloroethane, styrene, sec-butylbeneze and 4-isopropyltoluene each exceeded their standards in only 1 out of 10 samples.

Table 4-7 summarizes total VOC concentrations of the groundwater samples along with the approximate locations of these samples in relation to former MGP structures/features. The table also indicates whether any physical evidence of NAPL was noted in these samples. In addition, Figure 4-3 summarizes VOC and SVOC compounds that exceed NYSDEC groundwater standards at each monitoring well.

As indicated in Table 4-7, the highest levels of VOC in groundwater were detected along the western edge of Tax Lot 3 in the vicinity of the former Purifying House and gas holders. In general, the highest VOC concentrations were detected in the samples collected from the existing groundwater monitoring wells LMW-03 and LMW-04 that were installed within the former gas holders and screened just above the bedrock unit. None of the groundwater samples exhibited evidence of a separate phase layer of NAPL; however, each well, with the exception of MW-01 and MW-02, exhibited naphthalene-like odors. Table 4-7 indicates that there were three groundwater samples that exhibited total VOC concentrations in excess of 1,000 ug/l, and that each of these samples were collected within the vicinity of the westernmost former gas holders. In addition, the groundwater sample collected from MW-06 also exhibited a total VOC concentration of 4,068 mg/kg. MW-06 is located on the eastern boundary of Tax Lot 3 sidegradient of the easternmost former gas holders.

The maximum total VOC concentration of 11,980 ug/l was detected in the groundwater sample collected from existing groundwater monitoring well LMW-03, located in the northwest corner of Tax Lot 3. This well was previously installed during the geotechnical engineering study within the NW former gas holder. The well was screened just above the bedrock from 22

TABLE 4-7

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

WEST 42ND STREET FORMER MGP SITE

SITE CHARACTERIZATION STUDY

TOTAL VOC AND TOTAL SVOC CONCENTRATIONS IN GROUNDWATER SAMPLES*

Well ID	Total VOC Concentration (ug/l)	Total SVOC Concentration (ug/l)	Location (in Relation to Former MGP Structure/Feature)	Well Screen Interval (feet bgs)	Evidence of NAPL Noted in Sample
LMW-01	104	41	Upgradient of the former northeast gas holder.	30-40	No
LMW-02	11	33	Downgradient of the former southeast gas holder.	Information not Available	No
LMW-03	11,980	5,279	Within the former northwest gas holder.	22-32	No
LMW-04	10,577	743	Within the former southwest gas holder.	25-35	No
MW-01	41	ND	In vicinity of former Purifying House and MGP process area on Tax Lot 1.	7-17	No
MW-02	1,943	247	In vicinity of former Purifying House and MGP process area on Tax Lot 3.	7-17	No
MW-03	224	16	Downgradient of the former southwest gas holder.	7-17	No
MW-04	635	51	In the central vicinity of former gas holders.	7-17	No
MW-05	143	3	In southside of Tax Lot 3, downgradient of former gas holders.	7-17	No
MW-06	4,068	2,921	In eastside of Tax Lot 3, sidegradient of former gas holders.	7-17	No

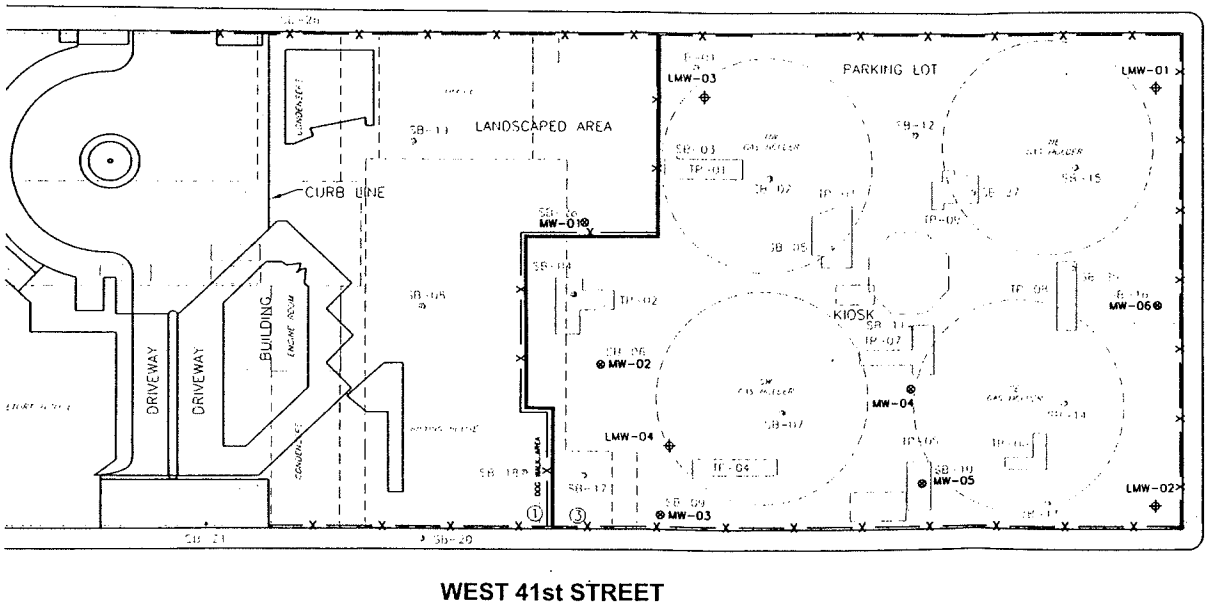
Note:

* Based on samples collected as part of the Site Characterization Study investigation.

ND: Not Detected.

LEGEND:

- SOIL BORING LOCATION
- TEST PIT LOCATION AND APPROXIMATE BOUNDARY
- MW-1 ● MONITORING WELL LOCATION
- LMW-02 ◆ PREVIOUSLY INSTALLED WELL LOCATIONS SAMPLED AS PART OF THE SCS (LANGAN ENGINEERING WELLS)
- BLOCK 1089 TAX BLOCK NUMBER
- (1) TAX NUMBER FOR PARCELS WITHIN FORMER MGP
- TAX LOT BOUNDARY
- —— X —— FENCE
- FORMER MGP STRUCTURES
- BOUNDARY OF SITE CHARACTERIZATION STUDY AREA



MONITORING WELL SAMPLES

	LMW-01		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	MTBE	17	10
	Benzene	37	1
	Ethylbenzene	10	5
	Total Xylenes	12	5
	Total VOCs	104	10,000
SVOCs	*Naphthalene*	*51*	*10*
	Total SVOCs	*51*	500,000

	LMW-02		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Total VOCs	11	10,000
SVOCs	*1,2,4-Trichlorobenzene*	*16*	*5*
	Total SVOCs	*55*	500,000

	LMW-03		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Benzene	870	1
	Toluene	470	5
	Ethylbenzene	650	5
	Total Xylenes	3,600	5
	Styrene	28	5
	Isopropylbenzene	420	5
	n-Propylbenzene	180	5
	1,3,5-Trimethylbenzene	1,400	5
	1,2,4-Trimethylbenzene	3,400	5
	sec-Butylbenzene	6	5
	4-Isopropyltoluene	16	5
	Total VOCs	11,980	10,000
SVOCs	*Naphthalene*	*3,800*	*10*
	2-methylnaphthalene	*53*	*20*
	Fluorene	*52*	*50*
	Phenanthrene	*140*	*50*
	Fluoranthene	*97*	*50*
	Pyrene	*100*	*50*
	Benzo (a) anthracene	*44*	*0.002*
	Chrysene	*49*	*0.002*
	bis(2-Ethylhexyl)phthalate	*25*	*5*
	Benzo(b)fluoranthene	*45*	*0.002*
	Benzo(k)fluoranthene	*19*	*0.002*
	Benzo(a)pyrene	*46*	*ND*
	Indeno(1,2,3-cd)pyrene	*37*	*0.002*
	Total SVOCs	*3,279*	500,000

	LMW-04		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Benzene	10,000	1
	1,2-Dichloroethane	89	0.6
	Toluene	53	5
	Ethylbenzene	210	5
	Total Xylenes	140	5
	Isopropylbenzene	31	5
	n-Propylbenzene	7	5
	1,3,5-Trimethylbenzene	9	5
	1,2,4-Trimethylbenzene	27	5
	Total VOCs	10,577	10,000
SVOCs	*Phenol*	*40*	*1*
	Naphthalene	*620*	*10*
	Total SVOCs	*733*	500,000

	MW-01		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Benzene	39	1
	Total VOCs	41	10,000
SVOCs	*Total SVOCs*	*ND*	500,000

	MW-02		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	MTBE	13	10
	Benzene	1,600	1
	Toluene	12	5
	Ethylbenzene	120	5
	Total Xylenes	140	5
	Isopropylbenzene	10	5
	1,3,5-Trimethylbenzene	10	5
	1,2,4-Trimethylbenzene	35	5
	Total VOCs	1,897	10,000
SVOCs	*Phenol*	*22*	*1*
	Naphthalene	*220*	*10*
	Total SVOCs	*247*	500,000

	MW-03		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Benzene	220	1
	Total VOCs	224	10,000
SVOCs	*Phenol*	*11*	*1*
	Total SVOCs	*16*	500,000

	MW-04		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Benzene	620	1
	Isopropylbenzene	7	5
	Total VOCs	634	10,000
SVOCs	*Phenol*	*8*	*1*
	Naphthalene	*23*	*10*
	Total SVOCs	*51*	500,000

	MW-05		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Benzene	120	1
	Ethylbenzene	8	5
	Total VOCs	143	10,000
SVOCs	*Total SVOCs*	*3*	500,000

	MW-06		
	Constituent	Concentration ug/l	Standard ug/l
VOCs	Benzene	1,600	1
	Toluene	28	5
	Ethylbenzene	1,700	5
	Total Xylenes	350	5
	Isopropylbenzene	120	5
	n-Propylbenzene	24	5
	1,3,5-Trimethylbenzene	32	5
	1,2,4-Trimethylbenzene	200	5
	Total VOCs	3,810	10,000
SVOCs	*2,4-Dimethylphenol*	*43*	*1*
	Naphthalene	*2,800*	*10*
	Total SVOCs	*2,921*	500,000

NOTE:
CONCENTRATIONS SHOWN FOR INDIVIDUAL COMPOUNDS THAT EXCEED NYSDEC GROUNDWATER STANDARDS. IN addition, CONCENTRATIONS OF TOTAL VOCs AND TOTAL SVOCs SHOWN FOR ALL GROUNDWATER SAMPLES.

SOURCE: MAP PROVIDED BY CONSOLIDATED EDISON. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON INTERPRETATION OF SANBORN MAPS AND DRAWINGS PROVIDED BY CONSOLIDATED EDISON CONTAINED WITHIN THE WEST 42nd STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT BY PARSONS, DATED AUGUST 2002 AND THE RIVER PLACE PHASE II, 42nd. STREET AND ELEVENTH AVENUE, GEOTECHNICAL ENGINEERING STUDY BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C., DATED JULY 2000.

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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

ANALYTICAL GROUNDWATER DATA

FIGURE 4-3

to 32 feet bgs. Groundwater recovered from LMW-03 exhibited a slight sheen and a strong naphthalene-like odor.

The second highest total VOC concentration of 10,577 ug/l was detected in the groundwater sample collected from existing groundwater monitoring well LMW-04, located in the southwest corner of Tax Lot 3 and within the former southwest (SW) gas holder. Note that benzene was detected at a concentration of 10,000 ug/l in this sample, which equates to over 94 percent of the total VOC concentration. Such a predominance of benzene in groundwater at a former MGP site is not typical and, therefore, may be considered anomalous. This well was installed during a previous geotechnical engineering study completed in July 2000 within the former SW gas holder. The well was screened just above the bedrock from 25 to 35 feet bgs. Groundwater recovered from LMW-04 exhibited a moderate naphthalene-like odor.

The third highest total VOC concentration of 4,068 ug/l was detected in the groundwater sample collected from newly installed groundwater monitoring well MW-06, located along the eastern boundary of Tax Lot 3 sidegradient of the former gas holders. The well was screened at the groundwater interface from 7 to 17 feet bgs. Groundwater recovered from MW-06 exhibited a moderate naphthalene-like odor.

The fourth highest total VOC concentration of 1,943 ug/l was detected in the groundwater sample collected from newly installed groundwater monitoring well MW-02, located between the SW former gas holder and the former Purifying House. The well was screened at the groundwater interface from 7 to 17 feet bgs. Groundwater recovered from MW-02 exhibited a slight naphthalene-like odor.

As shown on Figure 4-3, methyl tertiary-butyl ether (MTBE) was also detected at concentrations that exceeded the NYSDEC groundwater standard of 10 ug/l for MTBE in groundwater monitoring wells LMW-01 and MW-02. MTBE was detected at a concentration of 17 ug/l from the groundwater sample collected from LMW-01, located within the northeast corner of Tax Lot 3, directly downgradient of the adjacent Exxon/Mobil service station. MTBE was detected at a concentration of 13 ug/l from the groundwater sample collected from MW-02,

located along the western boundary of Tax Lot 3 east of the former Purifying House. MTBE is not associated with MGP-related constituents and was introduced as an additive to gasoline in 1979 with widespread use starting in the mid-1980s. As discussed in Section 1.4, the Exxon/Mobil station located immediately upgradient of Tax Lot 3 is an active NYSDEC petroleum spill site.

As previously stated and as shown on Figure 4-3, other VOCs detected in the collected groundwater samples at concentrations exceeding NYSDEC groundwater standards, other than BTEX compounds, included 1,2-dichloroethane, styrene, isopropyl benzene, n-propylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, sec-butyl benzene and 4-isopropyl toluene. However, these compounds were also observed in samples that exhibited elevated concentrations of BTEX compounds.

Semi-Volatile Organic Compounds (VOCs)

Nine out of 10 groundwater samples collected from the groundwater monitoring wells exhibited detectable levels of SVOCs. In almost all of the groundwater samples exhibiting detectable levels of SVOCs, PAHs were the most predominant compounds with BTEX comprising approximately 89% of the total SVOC in all samples. A review of the SVOC data presented on Table 8 in Appendix C indicates that naphthalene is the most frequently detected SVOC above its respective NYSDEC groundwater standard with 6 out of 10 samples exceeding the standard of 10 ug./l. Additionally, phenol exceeded its standard in 3 out of 10 samples; whereas, bis(2-ethylhexyl)phthalate exceeded its standard in 2 out of 10 samples. 1,2,4-trichlorobenzene, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene and 2,4-dimethylphenol each exceeded their standards in only 1 out of 10 samples.

Table 4-7 summarizes on-site groundwater samples that exhibited the highest SVOC concentrations along with the approximate locations of these samples in relation to former MGP structures/features. The table also indicates any physical evidence of NAPL was noted in these

samples. In addition, Figure 4-3 summarizes all VOC or SVOC compounds that exceed NYSDEC groundwater standards at each monitoring well location.

As indicated in Table 4-7 and consistent with the distribution of VOCs in groundwater, the highest levels of SVOCs in groundwater were detected along the western boundary of Tax Lot 3, just east of the former Purifying House. Additionally, elevated levels of SVOCs were also detected in the sample collected from newly installed groundwater monitoring well MW-06, located along the eastern boundary of the Tax Lot 3 sidegradient of the former gas holders.

The highest total SVOC concentration of 5,279 ug/l was detected in the groundwater sample collected from existing groundwater monitoring well LMW-03, located in the northwest corner of Tax Lot 3. Groundwater recovered from LMW-03 exhibited a slight sheen and a strong naphthalene-like odor. In addition, the predominant SVOC in the groundwater sample was naphthalene detected at a concentration of 3,800 ug/l or 72% of the total SVOC concentration. Overall, 13 out of the 64 SVOC compounds exceeded their respective NYSDEC groundwater standards in the sample collected from LMW-03.

The second highest total SVOC concentration of 2,921 ug/l was detected in the groundwater sample collected from newly installed groundwater monitoring well MW-06 located along the eastern boundary of Tax Lot 3 and sidegradient of the former gas holders. Groundwater recovered from MW-06 exhibited a moderate naphthalene-like odor. In addition, the predominant SVOC in the groundwater sample was naphthalene at a concentration of 2,800 ug/l or 95.8 % of the total SVOC concentration.

The third highest total SVOC concentration of 743 ug/l was detected in the groundwater sample collected from existing groundwater monitoring well LMW-04 located in the southwest corner of Tax Lot 3. Groundwater recovered from LMW-04 exhibited a slight sheen and a strong naphthalene-like odor. In addition, the predominant SVOC in the groundwater sample was naphthalene at a concentration of 620 ug/l or 83% of the total SVOC concentration.

The fourth highest total SVOC concentration of 247 ug/l was detected in the groundwater sample collected from newly installed groundwater monitoring well MW-02 located along the western boundary of Tax Lot 3 and directly east of the former Purifying House. Groundwater recovered from MW-02 exhibited a slight naphthalene-like odor. In addition, the predominant SVOC in the groundwater sample was naphthalene at a concentration of 220 ug/l or 89% of the total SVOC concentration.

As previously stated, SVOCs, other than PAH compounds, detected in the groundwater samples included phenol, 1,2,4-trichlorobenzene, bis(2-Ethylhexyl)phthalate and 2,4-dimethylphenol. Generally, however, these compounds were observed in samples that also exhibited elevated concentrations of PAH compounds.

As discussed in Section 3.0, groundwater appears to flow in a southerly direction within Tax Lot 3. Based on this flow direction, monitoring wells LMW-01 and LMW-03 would be considered upgradient, and wells MW-03, MW-05 and LMW-02 downgradient, with respect to the former MGP structures located within this portion of the site. As discussed above, upgradient well LMW-03 exhibited relatively high concentrations of VOC and SVOCs, whereas the listed downgradient wells exhibit significantly lower concentrations of these same chemical constituents. In addition, LMW-01 exhibited the gasoline additive MTBE in excess of the NYSDEC groundwater standard of 10 ug/l for this compound. The presence of MTBE at LMW-01 is likely attributable to the documented petroleum contamination associated with the Exxon/Mobil service station located upgradient of Tax Lot 3 on the corner of West 42nd Street and 11th Avenue.

While LMW-03 is located upgradient of the majority of former MGP structures, the well appears to have been installed through the foundation of the former NW gas holder and screened below the holder foundation from 30 to 40 feet bgs. Although no documentation could be provided as to the construction of this well, it is possible that the well was not constructed with a surface casing set into the holder foundation. Without this protective casing, monitoring well LMW-03 may be serving as a pathway for the downward migration of tar and related contaminants from within the gas holder, and into the underlying Clay Unit and bedrock unit. As

a result, the relatively high concentrations of VOC and SVOCs detected at this well could actually be associated with the tar-impacted soil that has been observed inside the former NW gas holder during the completed soil boring program. Similarly, LMW-04 appears to have been installed through the SW former gas holder and screened below the holder foundation between 30 to 40 feet below grade. LMW-04 also exhibits elevated concentrations of VOC and SVOCs. Therefore, LMW-04 could also be serving as a pathway for MGP-related compounds to be introduced to the underlying Clay Unit and bedrock.

TAL Metals and Cyanide

Metals analysis of groundwater samples collected from existing and newly installed monitoring wells located on Tax Lot 3 have been compared to NYSDEC groundwater standards and have been provided in Appendix C on Table 9. The ranges of TAL metal and total cyanide concentrations above SCG in the groundwater samples are summarized in Table 4-8.

As shown in Table 4-8, the highest concentrations of arsenic, barium, iron, manganese and sodium were found in the groundwater sample collected from existing monitoring well LMW-01 located in the northeast portion of Tax Lot 3 upgradient of the former gas holders. The well was screened just above the bedrock from 30 to 40 feet bgs. TAL metals that were most frequently detected in excess of NYSDEC groundwater standards included iron (10 out of 10 groundwater samples collected), manganese (9 out of 10 groundwater samples collected) and sodium (9 out of 10 groundwater samples collected). However, the elevated concentrations of these metals could be associated with a wide range of sources other than the former MGP. Total cyanide concentrations in four groundwater samples including MW-02 (270 ug/l), MW-04 (282 ug/l), LMW-03 (207 ug/l) and LMW-04 (275 ug/l) exceeded NYSDEC groundwater standards of 200 ug/l. Total cyanide compounds are commonly found in purifier or oxide box wastes which are generated through the purification of the manufactured gas.

TABLE 4-8
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET FORMER MGP SITE
SITE CHARACTERIZATION STUDY

TAX LOT 3 GROUNDWATER MONITORING WELL SAMPLES EXHIBITING TAL METALS AND TOTAL CYANIDE CONCENTRATIONS THAT EXCEED NYSDEC GROUNDWATER STANDARDS*

Constituents with NYSDEC Groundwater Standard Exceedances	NYSDEC Class GA Groundwater Standard or Guidance Value (ug/l)	Concentration Range	Frequency of Exceeding NYSDEC Groundwater Standard	Sample Exhibiting Maximum Concentration
Arsenic	25 ST	ND to 651 ug/l	1 of 10	LMW-01
Barium	1,000 ST	46.8 to 1,420 ug/l	1 of 10	LMW-01
Iron	300 ST^	827 to 22,500 ug/l	10 of 10	LMW-01
Lead	25 ST	ND to 51.7 ug/l	2 of 10	MW-03
Magnesium	35,000 GV	2,350 to 67,300 ug/l	6 of 10	MW-06
Manganese	300 ST^	213 to 2,750 ug/l	9 of 10	LMW-01
Sodium	20,000 ST	5,030 to 404,000 ug/l	9 of 10	LMW-01
Total Cyanide	200 ST	ND to 282 ug/l	4 of 10	MW-04

Notes:
* Based on samples collected as part of the Site Characterization Study investigation.
ST: Standard
GV: Guidance Value
^: Standard for the sum of Iron and Manganese is 500 ug/l.

4.4 Extent of MGP-Related Impacts

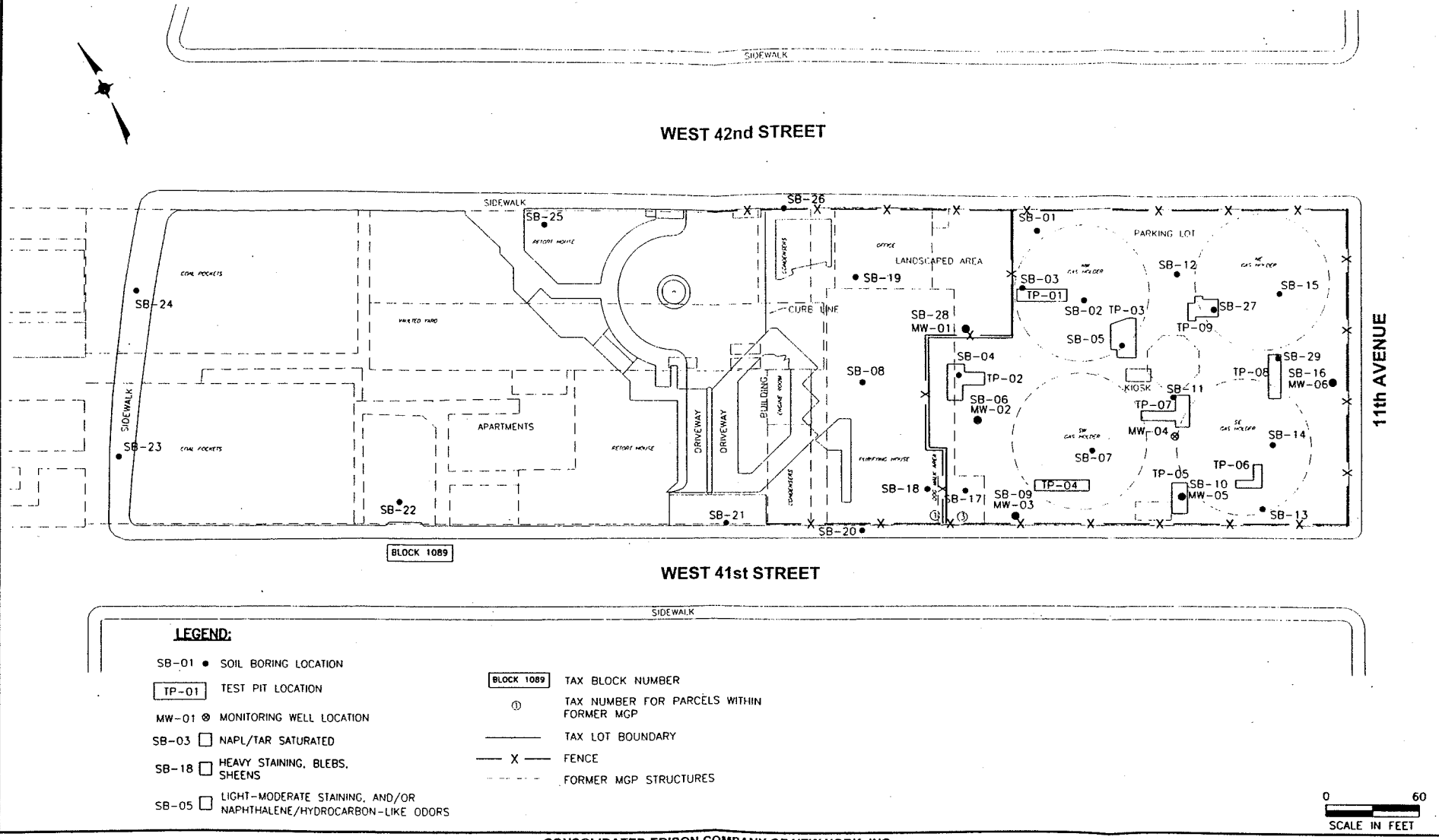
Figures 4-4 through 4-6 graphically depict the locations of soil borings and test pits completed as part of this investigation where evidence of MGP related impacts were noted in subsurface soil, including: NAPL or tar saturated conditions; heavy staining, blebs or sheens; or light to moderate staining and/or naphthalene/hydrocarbon-like odors. Figures 4-4 through 4-6 also graphically illustrate where these conditions were encountered if one or more soil samples exhibited these physical conditions in the shallow (0 to 10 feet bgs), intermediate (10 to 20 feet bgs) and deep (greater than 20 feet bgs) soil zones, respectively. In addition, Figures 4-7 through 4-12 graphically depict this same information vertically in geologic cross sections that traverse the site from West 42nd Street to West 41st Street and 11th Avenue and 12th Avenue.

Shallow Soil

Tax Lot 1

As indicated by Figure 4-4 and the geologic cross sections on Figures 4-7, 4-11 and 4-12, NAPL and/or tar saturated conditions were not observed in shallow subsurface soil (0 to 10 feet bgs) within Tax Lot 1. In addition, no evidence of MGP impacts was observed in shallow soil above a depth of 4 feet. However, several samples recovered below a depth of 7 feet from four borings located on Tax Lot 1 exhibited heavy staining and/or blebs and sheens including:

- SB-18 and SB-19 located within the landscaped area, in the vicinity of the former Purifying House;
- SB-22 located within the loading dock, in the vicinity of the former Retort House; and
- SB-26 located on the south sidewalk of West 42nd Street, in the vicinity of the northernmost former condenser.



CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL (0-10 FEET)

FIGURE 4-4

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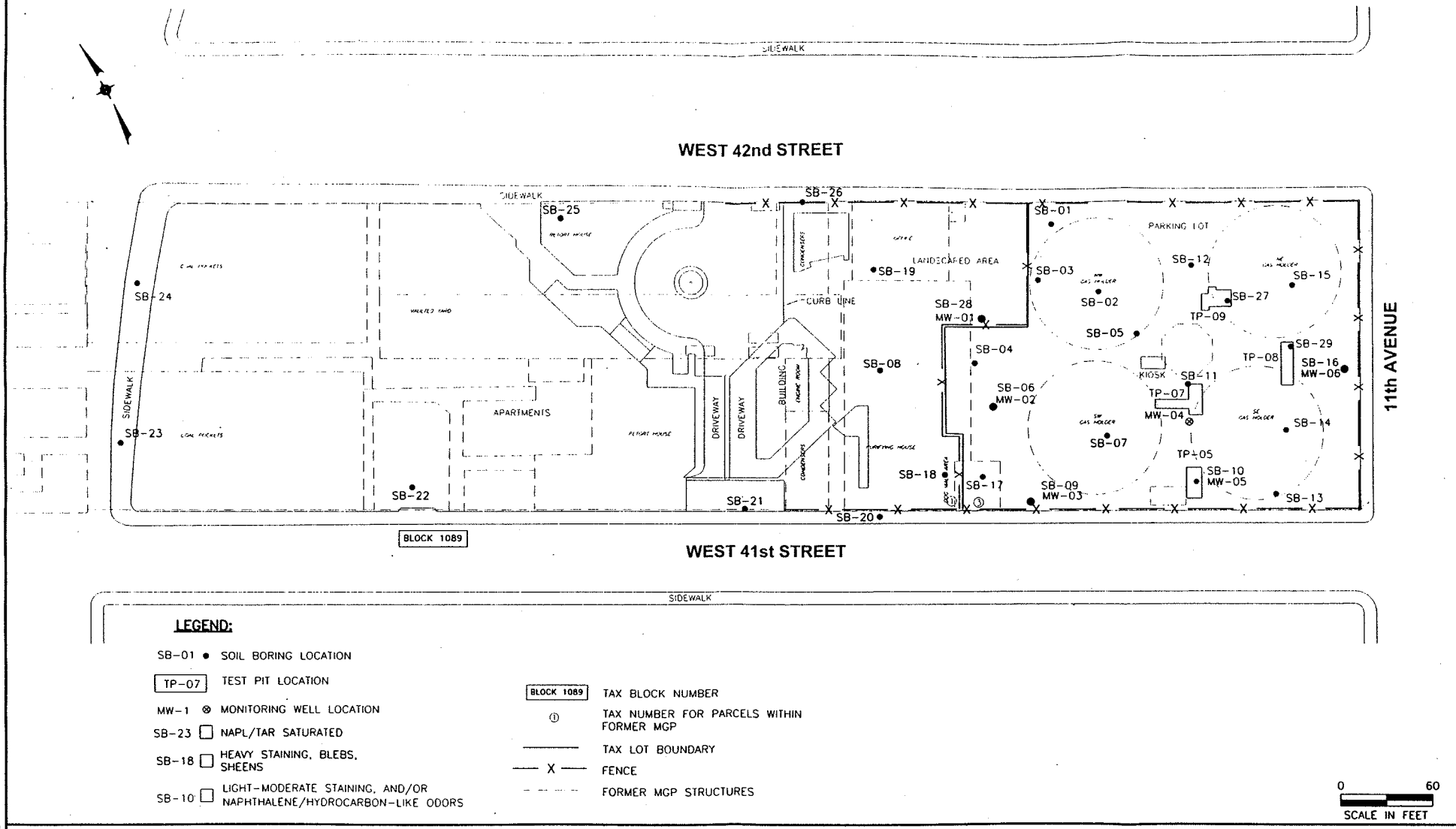

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL (10-20 FEET)

Dvirka and Bartilucci CONSULTING ENGINEERS
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FIGURE 4-5

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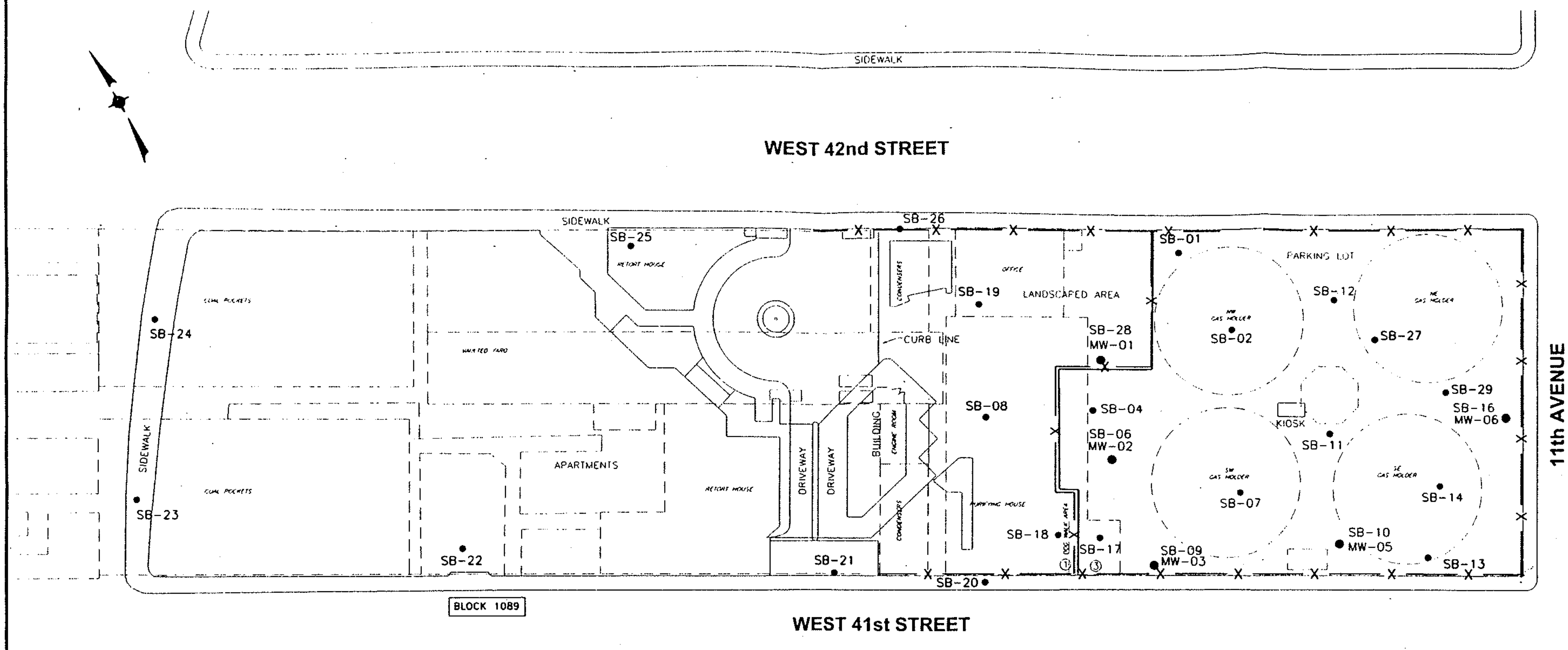

LEGEND:

SB-01 ● SOIL BORING LOCATION

MW-01 ⊗ MONITORING WELL LOCATION

SB-23 ☐ NAPL/TAR SATURATED

SB-22 ☐ HEAVY STAINING, BLEBS, SHEENS

SB-02 ☐ LIGHT-MODERATE STAINING, AND/OR NAPHTHALENE/HYDROCARBON-LIKE ODORS

BLOCK 1089 TAX BLOCK NUMBER

① TAX NUMBER FOR PARCELS WITHIN FORMER MGP

——— TAX LOT BOUNDARY

— X — FENCE

· · · · FORMER MGP STRUCTURES

0 60 SCALE IN FEET

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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL (> 20 FEET)

FIGURE 4-6

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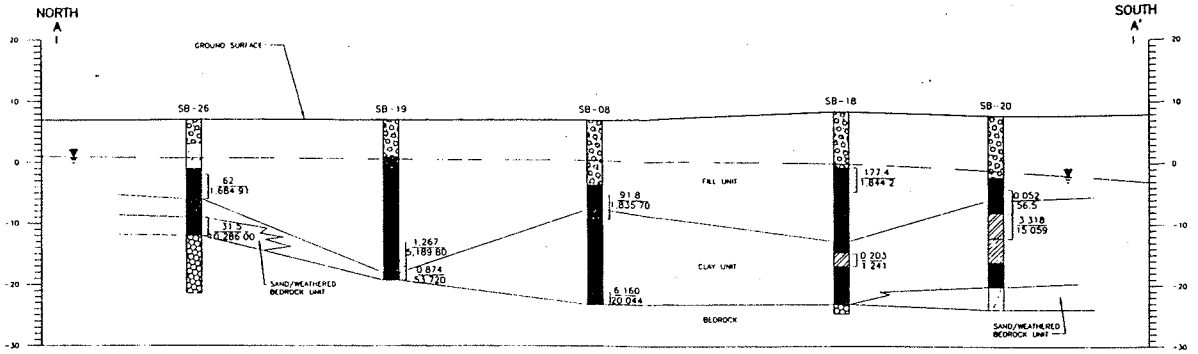


LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED
- NAPL/TAR SATURATED
- HEAVY STAINING, BLEBS, SHEENS
- LIGHT-MODERATE STAINING, AND/OR NAPHTHALENE/HYDROCARBON-LIKE ODORS

SOIL BORING

WELL SCREEN FOR MONITORING WELL

GROUND SURFACE

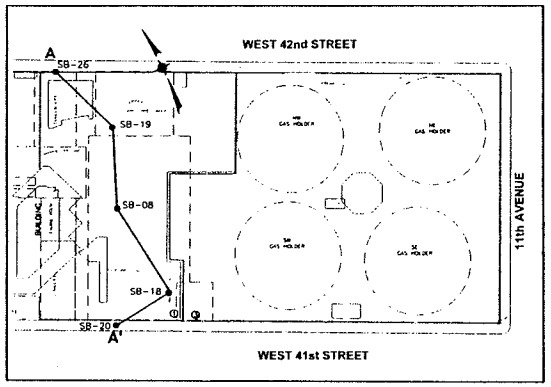
STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED

ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL DASHED WHERE INFERRED

$\frac{62}{1,684.91}$ $\frac{\text{TOTAL VOC (mg/kg)}}{\text{TOTAL SVOC (mg/kg)}}$ SOIL

20'

0 40'



KEY MAP
SHOWING CROSS-SECTION LINE

SCALE: 1"=100'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL-DEPICTED VERTICALLY IN NORTH-SOUTH GEOLOGIC CROSS SECTION A-A'

Dvirka and Bartilucci CONSULTING ENGINEERS
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FIGURE 4-7

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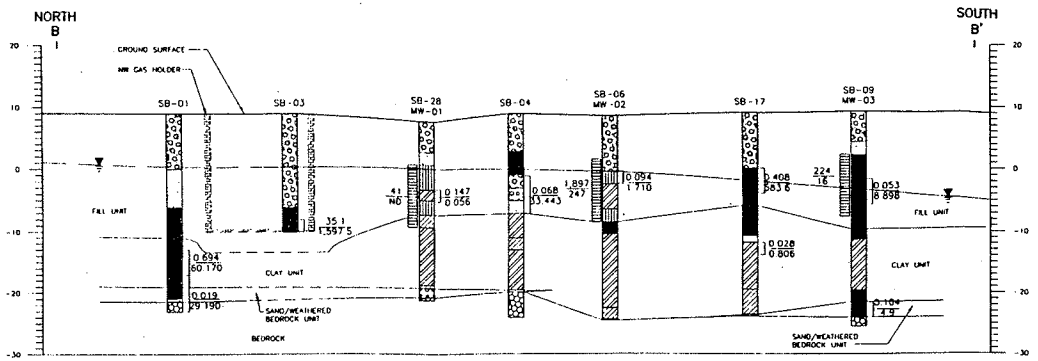


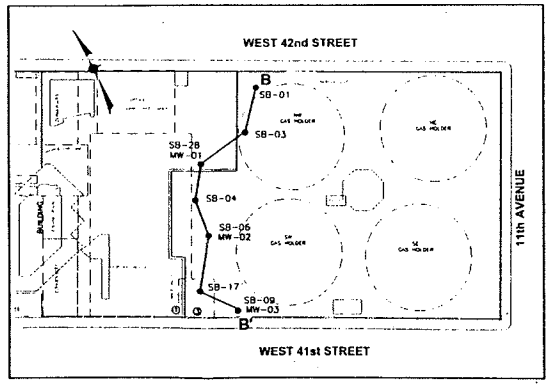
LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED TO COARSE SANDS TO FINE, MED TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED
- NAPL/TAR SATURATED
- HEAVY STAINING, BLEBS, SHEENS
- LIGHT-MODERATE STAINING, AND/OR NAPHTHALENE/HYDROCARBON-LIKE ODORS
- SOIL BORING
- WELL SCREEN FOR MONITORING WELL
- GROUND SURFACE
- STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED
- ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL DASHED WHERE INFERRED

41 / ND — TOTAL VOC (ug/L) / TOTAL SVOC (ug/L) GROUNDWATER

0.147 / 0.056 — TOTAL VOC (mg/kg) / TOTAL SVOC (mg/kg) SOIL

20' 0 40'



KEY MAP
SHOWING CROSS-SECTION LINE

SCALE: 1"=100'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL-DEPICTED VERTICALLY IN NORTH-SOUTH GEOLOGIC CROSS SECTION B-B'

FIGURE 4-8

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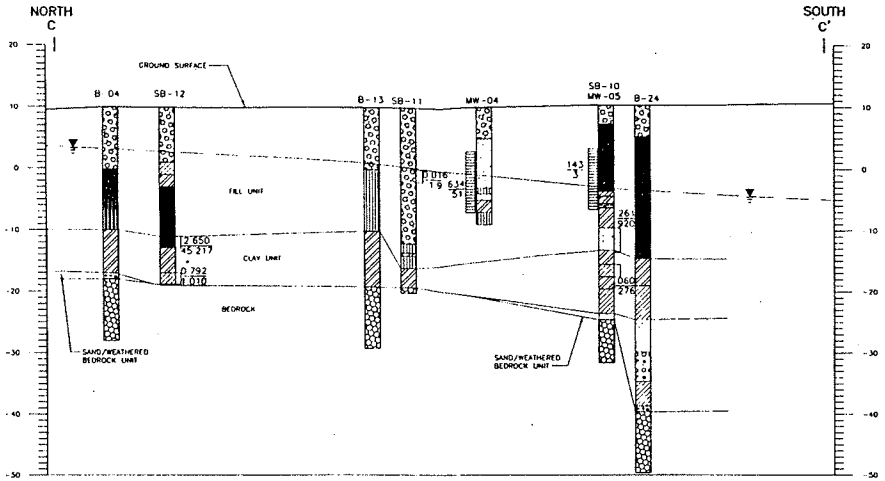


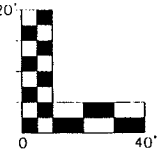
LEGEND

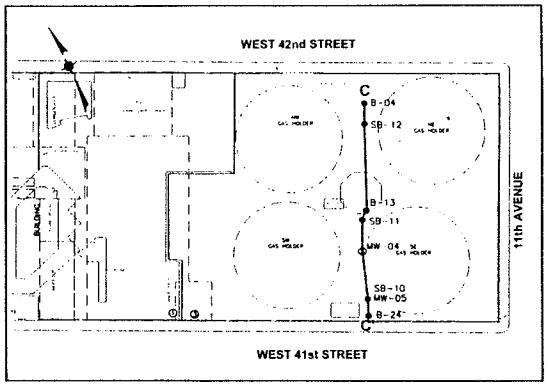
- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED
- NAPL/TAR SATURATED
- HEAVY STAINING, BLEBS, SHEENS
- LIGHT-MODERATE STAINING, AND/OR NAPHTHALENE/HYDROCARBON-LIKE ODORS

- SOIL BORING
- WELL SCREEN FOR MONITORING WELL
- GROUND SURFACE
- STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED
- ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL DASHED WHERE INFERRED

634 / 51 — TOTAL VOC (ug/L) / TOTAL SVOC (ug/L) GROUNDWATER

2,650 / 45,217 — TOTAL VOC (mg/kg) / TOTAL SVOC (mg/kg) SOIL





KEY MAP
SHOWING CROSS-SECTION LINE

SCALE: 1"=100'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL-DEPICTED VERTICALLY IN NORTH-SOUTH GEOLOGIC CROSS SECTION C-C'

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES P.C.

FIGURE 4-9

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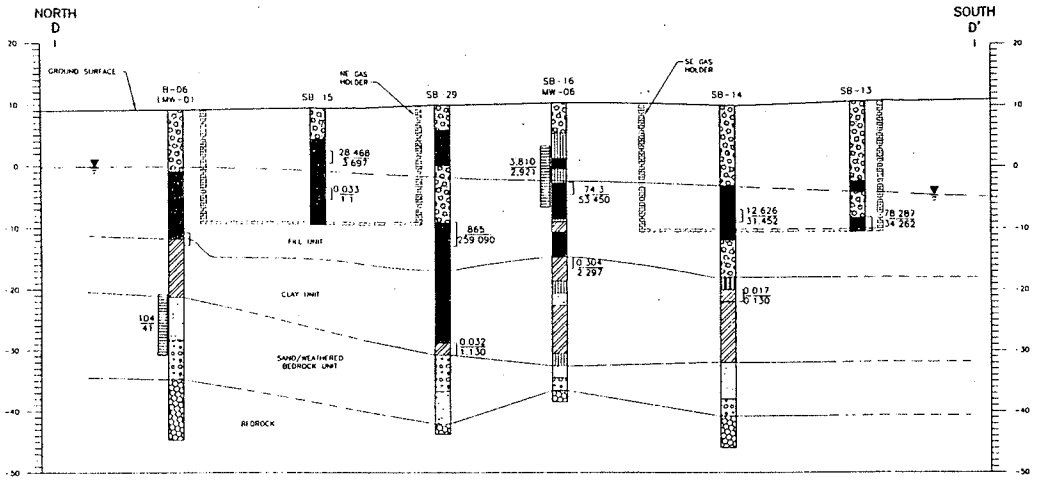


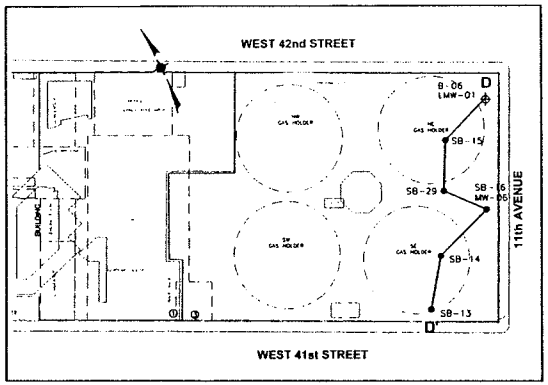
LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS, TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED
- NAPL/TAR SATURATED
- HEAVY STAINING, BLEBS, SHEENS
- LIGHT-MODERATE STAINING, AND/OR NAPHTHALENE/HYDROCARBON-LIKE ODORS
- SOIL BORING
- WELL SCREEN FOR MONITORING WELL
- GROUND SURFACE
- STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED
- ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL, DASHED WHERE INFERRED

3,810 / 2,921 TOTAL VOC (ug/L) / TOTAL SVOC (ug/L) GROUNDWATER

78,287 / 34,262 TOTAL VOC (mg/kg) / TOTAL SVOC (mg/kg) SOIL

20' 0 40'



KEY MAP
SHOWING CROSS-SECTION LINE

SCALE: 1"=100'

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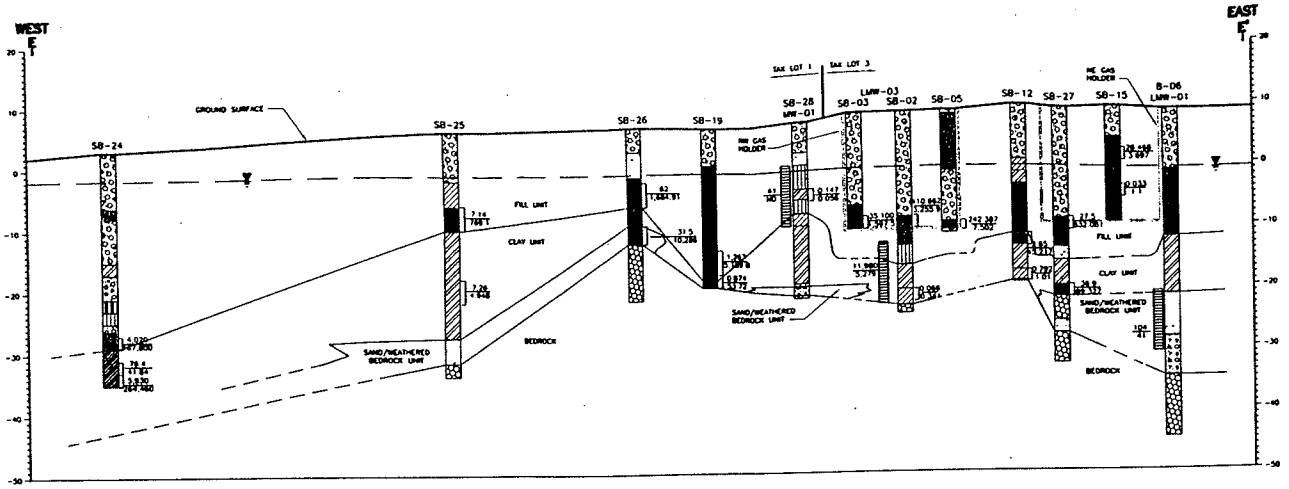
Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL-DEPICTED VERTICALLY IN NORTH-SOUTH GEOLOGIC CROSS SECTION D-D'

FIGURE 4-10



LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED. TO COARSE SANDS TO FINE, MED. TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED
- NAPL/TAR SATURATED
- HEAVY STAINING, BLEBS, SHEENS
- LIGHT-MODERATE STAINING, AND/OR NAPHTHALENE/HYDROCARBON-LIKE ODORS

41 / ND — TOTAL VOC (ug/L) / TOTAL SVOC (ug/L) GROUNDWATER

0.147 / 0.056 — TOTAL VOC (mg/kg) / TOTAL SVOC (mg/kg) SOIL

SOIL BORING

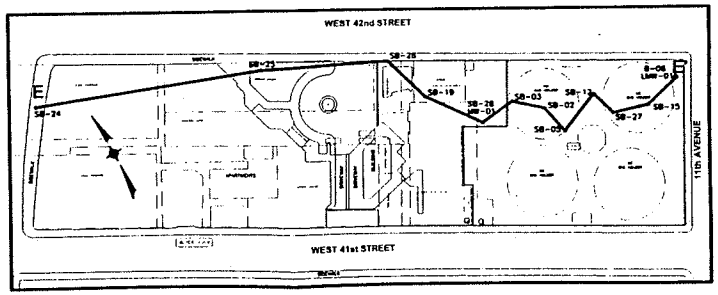
WELL SCREEN FOR MONITORING WELL

GROUND SURFACE

STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED

ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL, DASHED WHERE INFERRED

20' 0 100'



KEY MAP
SHOWING CROSS-SECTION LINE

SCALE:1"=150'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL-DEPICTED VERTICALLY IN EAST-WEST GEOLOGIC CROSS SECTION E-E'

FIGURE 4-11

Dvirka and Bartilucci CONSULTING ENGINEERS
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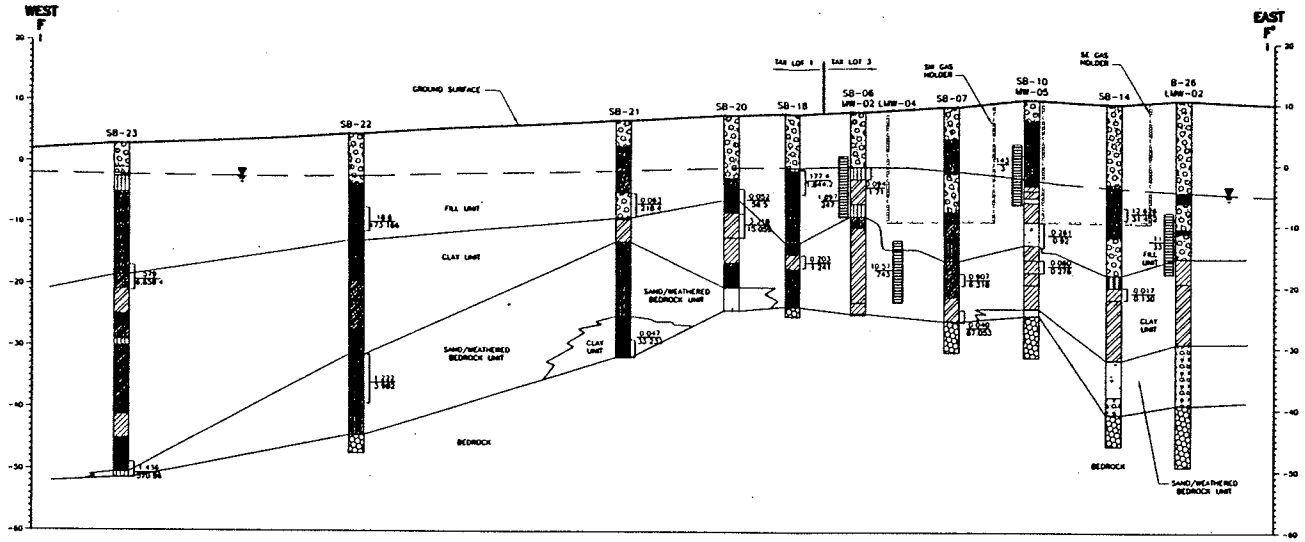


LEGEND

- FILL AND/OR TOPSOIL
- FINE, MED TO COARSE SANDS TO FINE, MED TO COARSE SANDS WITH GRAVEL
- SILT TO CLAY RICH SILT
- SILTY SAND TO SILT WITH SAND
- CLAY
- CLAY WITH SAND
- GRAVEL, GRAVEL WITH SAND
- BEDROCK
- MATERIAL NOT LOGGED
- NAPL/TAR SATURATED
- HEAVY STAINING, BLEBS, SHEENS
- LIGHT-MODERATE STAINING, AND/OR NAPHTHALENE/HYDROCARBON-LIKE ODORS

1,897 / 247 TOTAL VOC (ug/L) / TOTAL SVOC (ug/L) GROUNDWATER

1,436 / 570.96 TOTAL VOC (mg/kg) / TOTAL SVOC (mg/kg) SOIL

SOIL BORING

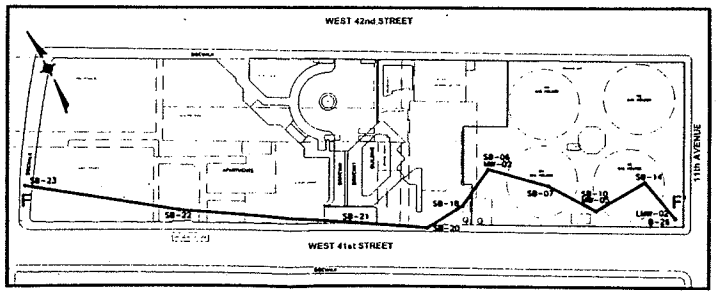
WELL SCREEN FOR MONITORING WELL

GROUND SURFACE

STRATAGRAPHIC CONTACT, DASHED WHERE INFERRED

ELEVATION OF WATER TABLE GIVEN IN FEET ABOVE MEAN SEA LEVEL DASHED WHERE INFERRED

20' 0 100'



KEY MAP
SHOWING CROSS-SECTION LINE
SCALE:1"=150'

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42nd STREET FORMER MANUFACTURED GAS PLANT SITE

FIELD OBSERVATIONS OF SUBSURFACE SOIL-DEPICTED VERTICALLY IN EAST-WEST GEOLOGIC CROSS SECTION F-F'

FIGURE 4-12

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

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At boring SB-08 completed in the landscaped area, little to no evidence of MGP impacts were noted in recovered soil samples collected above a depth of 10 feet bgs. Furthermore, soil samples recovered from SB-28, also completed in the landscaped area, exhibited little to no evidence of MGP impacts to a depth of 29 feet where the boring was terminated.

Tax Lot 3

As shown on the provided figures, NAPL/tar saturated conditions were not observed in the shallow zone within Tax Lot 3. In addition, no evidence of MGP impacts was noted in shallow soil above a depth of 5 feet with the exception of light soil staining observed at SB-05 located in the NW former gas holder and naphthalene-like odors at TP-08 located in the SE former gas holder. Below 5 feet, light to moderate soil staining and/or odors were noted within the former Purifying House (TP-02) and the SW former gas holder (TP-04 and SB-07). Additionally, a sheen was noted at TP-06 located in the SE former gas holder. Finally, shallow subsurface soil at SB-15 exhibited strong hydrocarbon odors. However, soil boring SB-15 was completed downgradient of the Exxon/Mobil service station, which is a known NYSDEC petroleum spill site.

Finally, the shallow soil zone within the central portion of Tax Lot 3, as indicated by soil recovered from TP-07, SB-11 and MW-04, did not exhibit evidence of MGP impacts.

Intermediate Soil

Tax Lot 1

Figure 4-2 and the geologic cross section on Figure 4-12 indicate that soil boring SB-23, completed within the southernmost former coal pocket along 12th Avenue, exhibited NAPL/tar saturated conditions at intervals within the intermediate soil zone (10 to 20 feet bgs). The review of the cross sections provided on Figures 4-7, 4-11 and 4-12 illustrate that MGP-related impacts are most prevalent below a depth of 10 feet within Tax Lot 1 which places the majority of the impacted soil below the water table within this portion of the former MGP. MGP impacts were

not observed within the intermediate soil zone in Tax Lot 1 at soil boring SB-28 located within the landscaped area. SB-24, located on 12th Avenue, exhibited only a very slight naphthalene-like odor at 10 to 11 feet bgs in the intermediate soil zone.

Tax Lot 3

As illustrated by Figure 4-2 and the geologic cross sections on Figures 4-8 through 4-12, areas of staining and/or odors were observed throughout Tax Lot 3 in the intermediate soil zone, including within and in the vicinity of all four former gas holders. However, NAPL/tar saturated conditions were not observed within the intermediate soil zone. Note that the former holder foundation bottoms are situated within the lower limit of the intermediate soil zone. In general, soil recovered immediately above the former holder foundation bottoms exhibited light to heavy tar staining, sheens and hydrocarbon and/or naphthalene-like odors. In addition, similar conditions were observed at SB-16, located between and to the east of the NE and SE former gas holders.

Deep Soil

Tax Lot 1

The review of the cross sections provided on Figures 4-7, 4-11 and 4-12 indicate that MGP impacts are not present in subsurface soil within the deep soil zone (greater than 20 feet bgs) at soil borings SB-25 and SB-26 both located along the southern sidewalk of West 42nd Street and SB-28 located within the landscaped area. It is important to note that bedrock was encountered at 20 feet during the completion of SB-26. Subsurface soil samples collected from the remaining borings completed at Tax Lot 1 exhibited evidence of MGP impacts within the deep zone with soil staining and/or odors observed as deep as the bedrock/soil interface at SB-18, SB-19, SB-21, SB-22 and SB-23. Soil borings SB-18, SB-19 and SB-21 are located in areas where the Clay Unit is relatively thin or absent.

Similar to the intermediate soil zone, NAPL/tar was observed at saturated conditions in the deep soil zone at SB-23. Furthermore, soil staining, sheens and odors were observed intermittently throughout the Clay Unit at this boring. In addition, NAPL/tar was observed at saturated conditions in the deep zone at SB-24; however, as detailed in Section 4.2.1, this boring was terminated at 38 feet in order to avoid the vertical migration of this mobile NAPL/tar.

Tax Lot 3

Note that the deep soil zone within Tax Lot 3 generally includes soil below the foundations of the former gas holders. Soil samples recovered from borings completed in Tax Lot 3 indicate MGP impacts are present within the deep soil zone below and adjacent to all former gas holders; however, NAPL/tar was not encountered at saturated levels. The most significant impacts appear to be present within the vicinity of the NW and NE former gas holders with a hydrocarbon-like odor and sheen observed to 30 feet bgs at SB-01 (located immediately northwest of the NW former holder) and a sheen and moderate naphthalene-like odor observed to a depth of 31 feet bgs at SB-27 (located within the NE former holder). At both locations, evidence of MGP impacts penetrates the Clay Unit. In addition, evidence of MGP impacts including hydrocarbon/naphthalene-like odors were observed below the SW former gas holder up to a depth of 31 feet bgs at SB-07. The SE former gas holder exhibited the least amount of MGP impacts within the deep soil zone with soil staining and odors observed to only 22 feet bgs at SB-14 immediately below the holder foundation bottom.

In general, while MGP impacts were observed in the deep soil zone within Tax Lot 3, these impacts do not appear to exceed 25 feet in depth and do not penetrate the Clay Unit at most boring locations. However, at several boring locations including SB-01, SB-07, SB-09 and SB-29, evidence of impact, including sheens and odors have been observed up to 39 feet bgs.

Finally, the deep soil zone within the central portion of Tax Lot 3, as indicated by soil samples recovered from SB-11, did not exhibit evidence of MGP impacts.

4.5 Historical Map Research Investigation

On November 20, 2003, D&B conducted a historical map research investigation to help further identify the location and extent of the former naphthalene and light oil tanks formerly located adjacent to the Hudson River bulkhead and associated with the former MGP site. Various experts on New York City history were consulted. Based on historian Ann Buttenwieser's recommendation, the research investigation began at City Hall Library located at 31 Chambers Street, New York, New York. Mrs. Buttenwieser recommended consulting the references entitled, "Department of Docks and Ferries," which are produced annually. Map years between 1901-1936 were searched; however, information related to the site and its associated naphtha/oil tanks located near Pier 81 could not be obtained. Similarly, City Hall Library's historical map files were searched; however, no relevant information regarding the site could be obtained.

Additionally, D&B visited the New York Public Library located on the corner of Fifth Avenue and 42nd Street in Manhattan, as per the recommendations of geographer Jack Eichenbaum. In the Map Department (Room 117), D&B reviewed and copied hardcopy and microfilm versions of historical maps dating from 1890-1974. In all, 5 Sanborn maps (1890-1930), 10 Bromley maps (1897-1974) and 1 Hyde map (1913) were obtained, and are provided in Appendix E.

After careful review of these historical maps, it was noted that the naphtha/oil tanks located adjacent to Pier 81 appeared on the 1926 Bromley map but were not present on the 1930 Bromley map. In addition, it was observed that the shoreline had not changed significantly within this time period (1926-1930). Based on the review of these historical maps, it is apparent that the former naphtha and oil tanks were located on-shore and not on Pier 81. Given that the shoreline appears to have changed little since the former MGP was in operation, it can be concluded that the foundations for these tanks may be present between the western side of 12th Avenue and the present day Hudson River bulkhead beneath the parking lot of commercial waterfront operations.

In addition, it appears that the naphtha/oil tanks were removed between the years 1926 and 1930. This corresponds to Parsons Site History Report, which states that "The PCS report for 1925 indicates the MGP was no longer in operation, suggesting the change in ownership corresponded with the end of the MGP's use/life." The Parsons report also states that the MGP was demolished in the 1920's; however, the report does not mention the fate of the naphtha/oil tanks.

4.6 Human Health Exposure Assessment

The purpose of this exposure assessment is to determine how and when an individual might be exposed to contaminants of potential concern associated with the West 42nd Street former MGP site. A contaminant of potential concern (COPC) is any chemical detected in a medium, which could produce adverse health effects under the right conditions of dose and exposure. For exposure to occur, there must be a complete "pathway of exposure" where a person can come into contact with contaminants of potential concern. For a pathway to be complete, there must be: 1) a source or medium containing the COPC; 2) a location where human contact could take place (i.e., an exposure point); and 3) a feasible means for the COPC to enter into the person's body. The person who could come into contact with the COPC at an exposure point is called a "receptor." The ways in which the COPC can enter the body are called "routes of exposure." Ingestion (by mouth), dermal (contact with skin) and inhalation (breathing into the lungs) are the routes of exposure considered in this and other human health risk assessments. Consistent with the New York State Department of Health (NYSDOH) and other regulatory agencies, this assessment considers both current and potential future exposures.

As with any exposure assessment, this assessment is not intended to predict disease outcome, but rather, is meant to be used as a tool to make decisions regarding the need for remediation or the institution of precautionary measures, such as limiting the affected area to non-residual land uses. Given the available information for this site, and keeping the purpose of the assessment in mind, the following evaluation for the West 42nd Street former MGP site is qualitative, with an emphasis on exposure assessment. Consistent with the presentation of the environmental data in Section 4.0, the exposure assessment is presented by medium of interest.

4.6.1 Surface Soil

Surface soil samples were not collected as part of the SCS due to the fact that Tax Lots 1 and 3 are currently paved with concrete or asphalt and the majority of Tax Lot 1 is currently occupied by an apartment building. While a portion of Tax Lot 1 contains a landscaped area with areas of grass sod and flower beds, the top several feet of soil used to construct these areas reportedly consists of fill from an off-site location brought in for construction. Therefore, exposure to surface soil containing site related contaminants is not expected under current site conditions.

According to information provided by the current site owner, there are plans to construct an apartment building on Tax Lot 3 in the near future. Therefore, appropriate health and safety measures will be implemented during construction activities to prevent the exposure of on-site workers to contaminants that may be present in surface soil. In addition, windblown dust and soil vapors will be controlled during the excavation activities in order to eliminate the potential exposure of off-site receptors to MGP contaminants.

However, no significant exposures to surface soils via direct contact are expected after the construction of the apartment complex due to the fact that the redevelopment plans for Tax Lot 3 reportedly call for the coverage of the majority of the property by an apartment building, which will prevent soil contact. In landscaped areas, which will not be covered by buildings, the upper 2 feet of surficial soils will reportedly be removed and replaced with 2 feet of clean soil.

4.6.2 Subsurface Soil

Subsurface soil samples were collected for chemical analysis from test pits and soil borings. The locations of these samples are shown on Figure 2-1, provided in Section 2.0. Thirty-four out of 61 of the subsurface soil samples contained VOCs (predominantly BTEX) at levels exceeding RSCOs. RSCOs for SVOCs (predominantly PAHs) were exceeded in 46 of the

61 subsurface soil samples analyzed for SVOCs. Metals and total cyanide were also detected at concentrations above RSCOs in numerous subsurface soil samples.

Based on the current site setting of Tax Lots 1 and 3, exposure to contaminated subsurface soil would not be expected for most on-site and off-site receptors. The only significant potential for exposure to the subsurface soil contaminants under current conditions is for utility/construction workers who may need to complete on-site excavations associated with the installation or repair of subsurface utilities. During excavation activities, workers could be exposed to subsurface soil contaminants through several routes of exposure, including dermal contact and inhalation.

As discussed previously, there are plans to construct an apartment building on Tax Lot 3 in the near future. The proposed building design includes the construction of a below grade garage and foundation footings that will require soil excavation to a depth of up to 15 feet below grade. As a result, excavation of subsurface soil containing relatively high concentrations of VOCs, SVOCs, metals and cyanide will be required. Therefore, appropriate health and safety measures will be implemented to prevent the exposure of on-site workers to contaminated subsurface soil during excavation and foundation construction activities. In addition, due to the proximity of the site to city sidewalks and streets, wind-blown dust and vapors will be controlled during excavation activities in order to eliminate the potential exposure of off-site receptors to MGP contaminants.

4.6.3 Groundwater

Note that as discussed in Section 2.4, the investigation of groundwater quality as part of the SCS was limited to Tax Lot 3 and, therefore, the evaluation of exposure pathways for this environmental media is limited to this portion of the site.

Groundwater sampling conducted at Tax Lot 3 has shown that site groundwater is contaminated with VOCs, SVOCs, metals and cyanide in excess of NYSDEC groundwater standards. However, under current conditions, exposure to this contaminant source is not

expected given the fact that groundwater is not used for any potable or nonpotable uses. Under current site conditions, utility/construction workers may need to complete on-site excavations in order to repair or install subsurface utilities, however, on-site groundwater is approximately 8 to 14 feet below grade at Tax Lot 3 and, therefore, it is unlikely that groundwater would be encountered under these types of activities.

On-site groundwater represents a potential source of contamination to the Hudson River through discharge of groundwater to the river. As discussed in Section 1.4, the Hudson River is classified as a Class I saline surface water within the vicinity of the former MGP site and, as such, is not considered a potential source of potable water supply. Therefore, potential exposures to humans would likely be limited to recreational use of the river, primarily for boating in this reach of the Hudson River. Thus, the potential for substantial human exposure to contaminants from the site via surface water is extremely limited.

While under current conditions exposure to contaminated groundwater is not expected, the planned construction of the apartment building will require excavation below the water table. Similar to subsurface soil, on-site groundwater represents a significant contaminant source in which on-site workers could be exposed through direct dermal contact, as well as inhalation of contaminants that may volatilize from the groundwater; therefore, appropriate health and safety measures will be implemented. In addition, due to the proximity of Tax Lot 3 to city sidewalks and streets, volatilized groundwater will be controlled during excavation activities in order to eliminate the potential exposure of off-site receptors to MGP contaminants.

The construction of the apartment building within Tax Lot 3 calls for the construction of a parking garage that will be located partially below the water table. Therefore, there is a potential for contaminated groundwater or for gaseous contaminants that have volatilized from the groundwater to seep into this area after building construction. However, according to the property owner, the design of the foundation includes the installation of a vapor control/ waterproofing system to prevent this potential exposure pathway from occurring throughout the expected life of the building.

4.6.4 Air

Under current conditions, inhalation of contaminants released to the air through the volatilization of these compounds from subsurface soil and groundwater is a potential exposure pathway for on-site receptors located on Tax Lot 1 due to the fact that this property is currently used for residential purposes. However, an assessment of indoor and outdoor air was conducted at the apartment building located on Tax Lot 1 (in April of 2003) to ascertain whether air quality within the apartment buildings was being adversely affected by the subsurface contamination identified within Tax Lot 1. The report for this assessment is provided in Appendix F and was prepared by RETEC Group, Inc. (RETEC) under contract with Con Edison.

After an initial inspection of the building by RETEC, a total of three indoor air samples were collected from the ground floor of the building. Four air samples were collected from outside of the building for comparison purposes. Results indicated that the air quality was not impacted by subsurface intrusion of vapors emanating from any MGP-related material. Compounds detected in the indoor air samples were present in concentrations within the range of typical background levels for indoor air quality or were comparable to the results of the outdoor air samples.

Two compounds were detected at concentrations above the typical range for background residential indoor air (above the 95th percentile): acetone and bromomethane. These compounds were also detected in the outdoor (ambient) samples at similar concentrations. The concentrations of these compounds were detected at relatively low concentrations and at least two orders of magnitude below Occupational Safety and Health Administration (OSHA) worker guidance Permissible Exposure Limits (PELs), and below American Conference of Governmental Industrial Hygienists - Threshold Limit Values (ACGIH-TLV).

RETC concluded in the assessment that the quality of the air sampled within the apartment building at Tax Lot 3 is generally within the range expected for indoor air, and that the indoor air quality does not appear to be impacted by subsurface intrusion of vapors emanating from any MGP-related subsurface contamination. Similar exposure conditions can be assumed to be encountered at the future apartment building to be constructed on Tax Lot 3.

5.0 CONCLUSIONS AND RECOMMENDATIONS

This section presents a discussion of the conclusions and recommendations associated with the nature and extent of chemical constituents present at the West 42nd Street former MGP site, based on the findings of the Site Characterization Study field investigation, as well as the human health exposure assessment. Where appropriate, additional investigation activities are recommended to further delineate the nature and extent of known chemical constituents.

5.1 Tax Lot 1 - Field Investigation

Subsurface Soil

- A total of 11 subsurface soil borings were advanced on Tax Lot 1 and 22 soil samples were selected for chemical analysis. All of the subsurface soil samples selected for chemical analysis exhibited detectable levels of VOCs with the maximum total VOC concentration of 5,930 mg/kg observed in soil sample SB-24 (36-38 feet) collected along the east side of 12th Avenue immediately adjacent to the northernmost former coal pocket. SB-24 exhibited evidence of mobile tar/NAPL. As with total VOC concentrations, all of the subsurface soil samples selected for chemical analysis exhibited detectable levels of SVOCs with the maximum total SVOC concentration of 264,460 mg/kg also observed in soil sample SB-24 (36-38 feet).

- Fourteen out of 22 subsurface soil samples selected for analysis exhibited detectable levels of total cyanide. The maximum cyanide concentration of 126 mg/kg was detected in sample SB-08 (12-16 feet). Subsurface soil sample SB-08 (12-16 feet) also exhibited elevated levels of lead and mercury at concentrations of 841 and 3.2 mg/kg, respectively. Soil boring SB-08 was completed within the central portion of the landscaped area within the vicinity of the former Purifying House and exhibited a sheen and strong naphthalene-like odor.

- In general, MGP impacts were not observed in shallow subsurface soil of less than 4 feet in depth. The most significant MGP impacts, including the highest VOCs, SVOCs and metal concentrations were most prevalent in the Fill Unit below a depth of 10 feet, which places the majority of the impacted soil below the water table. However, at most locations, contaminant concentrations decrease rapidly below a depth of 24 feet. This rapid decrease in contaminant concentrations is likely due to the confining ability of the underlying Clay Unit. Exceptions to this general trend include borings SB-23 and SB-24 where NAPL/tar at saturated conditions was observed to a depth of up to 38 feet and within the Clay Unit.

- The Bedrock Unit within Tax Lot 1 was not observed to be impacted by MGP residuals.

Human Health Exposure Assessment

- Based on existing conditions and use of the site, exposure to MGP contaminants would not be expected for most on-site and off-site receptors. Currently Tax Lot 1 contains a large apartment building and the remaining land is either paved or landscaped. An assessment of indoor and outdoor air quality at Tax Lot 1 concluded that air quality is not being impacted by MGP-related subsurface contamination present at the site.

- The only potential for future exposure to MGP contamination at Tax Lot 1 is associated with utility/construction workers who may be involved with on-site excavations in support of the installation or repair of subsurface utilities within or in the vicinity of Tax Lot 1. However, health and safety measures will be implemented during these activities, to prevent exposure to subsurface soil contaminants.

Recommendations

Based on the findings described above, additional field investigation is recommended within the vicinity of Tax Lot 1, including:

- Findings of this investigation indicate that a number of potential MGP contaminant source areas are possibly located west of Tax Lot 1, including two former oil tanks and eight former naphtha storage tanks. Therefore, soil borings are recommended in this area to further delineate the western portion of the former MGP across 12th Avenue. Furthermore, additional information is needed to define the nature and extent of MGP residuals identified at soil borings SB-24 and SB-23 that were completed along the eastern sidewalk of 12th Avenue. Therefore, additional soil borings are recommended in this area.

- Installation of shallow (water table) monitoring wells are recommended within the vicinity of Tax Lot 1 in order to determine the nature and extent of chemical constituents in groundwater, determine groundwater flow direction and provide information about possible impacts to the Hudson River. In addition, deep groundwater monitoring wells screened at or near the Bedrock Unit may be warranted to assess the extent of mobile tar/NAPL in the vicinity of 12th Avenue.

The above recommendations can be undertaken independent of the construction activities currently planned for Tax Lot 3. Therefore, the development of Tax Lot 3 will not be delayed by this additional field investigation. Remedial actions for Tax Lot 1 and areas located to the west, if warranted, will be considered pending the outcome of the recommended investigations.

5.2 Tax Lot 3 - Field Investigation

Subsurface Soil

- A total of 18 soil borings and 9 test pits were advanced within Tax Lot 3 with a total of 39 subsurface soil samples selected for chemical analysis. All of the subsurface soil samples selected for chemical analysis exhibited detectable levels of VOCs with the maximum total VOC concentration of 865 mg/kg observed in soil sample SB-29 (19-23 feet) collected along the eastern edge of the site, between the northeast and southeast former MGP gas holders. All of the subsurface soil samples selected for chemical analysis exhibited detectable levels of SVOC compounds with the maximum total SVOC concentration of 12,010 mg/kg observed in soil sample TP-02 (9-9.5 feet) collected within the former Purifying House foundation walls.

- Twenty-nine out of 39 subsurface soil samples selected for analysis exhibited detectable levels of total cyanide. The maximum total cyanide concentration of 1,580 mg/kg was detected in sample SB-17 (9-13 feet). Soil boring SB-17 was completed along the western portion of Tax Lot 3 within the vicinity of the former Purifying House.

- Evidence of tar/NAPL at saturated levels was not observed in subsurface soil within Tax Lot 3. In general, MGP impacts were not observed in shallow subsurface soil of less than 5 feet in depth throughout the majority of Tax Lot 3.

- The most significant MGP impacts were observed in the Fill Unit at depths ranging from 17 to 23 feet bgs, and within and immediately adjacent to the former gas holders. Furthermore, the samples exhibiting the highest VOC concentrations were collected from immediately above the former holder bottom foundations or, in the case of SB-29, immediately outside of the former holder bottoms. Soil below and adjacent to the NW and NE former gas holders exhibited sheens and odors to a depth of up to 31 feet bgs. In addition, evidence of MGP impacts, including light to moderate odors, were observed below the SW former gas holder up to a depth of 31 feet bgs. The SE former gas holder exhibited the least amount of MGP impacts with only light to moderate staining and odors observed to 22 feet bgs.

- At most boring locations, MGP residuals do not appear to penetrate the Clay Unit within Tax Lot 3, indicating that it serves as an effective confining unit limiting the

vertical migration of these contaminants. However, at several locations, including SB-01, SB-07, SB-09 and SB-29, evidence of MGP residuals were encountered within the Clay Unit. The MGP residuals and associated chemical constituents are able to penetrate the Clay Unit due to one or more of the following factors:

  - In several areas, the Clay Unit is relatively thin or absent.

  - The Clay Unit has been shown to contain silty sand lenses that can increase the vertical permeability of the Clay Unit where present.

  - In areas where NAPL/tar may have existed at saturated levels, the mobility of this material may have been sufficient to penetrate the Clay Unit.

- The Bedrock Unit was not observed to be impacted by MGP residuals within Tax Lot 3.

Groundwater

- Depth to groundwater within Tax Lot 3 ranges from 8 to 14 feet below grade, with groundwater generally flowing to the south.

- Measurable separate-phase NAPL was not detected in any of the monitoring wells; however, moderate to strong naphthalene-like odors were encountered in all the wells with the exceptions of MW-01 and MW-02. In addition, LMW-03 exhibited evidence of a slight sheen. Based on boring log information, LMW-03 appears to be located within the former NW gas holder.

- The highest total VOC and total SVOC concentrations in on-site groundwater were detected in samples collected from monitoring LMW-03 and LMW-04. As discussed above, the sample collected from LMW-03 exhibited a slight sheen and appears to be located within the former NW gas holder. Similarly, LMW-04 appears to be located within the former SW gas holder and both wells are screened well below the water table immediately above the Bedrock Unit. As discussed above, the most significant soil impacts were observed to a depth of 23 feet, well above the Bedrock Unit. Therefore, it is possible that LMW-03 and LMW-04 are serving as vertical migration pathways for contaminants within and below the former gas holders. As a result, the high concentrations of VOCs and SVOCs detected in these wells may actually be associated with the MGP impacted soil that has been identified within and below the former gas holders and not representative of true groundwater quality above the Bedrock Unit. Furthermore, LMW-03 appears to be partially screened with the relatively permeable sand/weathered Bedrock Unit and there is the potential for contaminants entering this well screen to spread horizontally into this geologic unit. However, LMW-04 appears to be fully screened in the relatively impermeable Clay Unit and horizontal migration would not be expected at this well.

- The third highest total VOC concentration and the second highest total SVOC concentration identified in on-site groundwater were detected in the groundwater sample collected from MW-06 screened at the water table between the easternmost former gas holders. In addition, based on a southerly direction of groundwater flow, MW-06 is located downgradient of an Exxon/Mobil Service Station, a known NYSDEC petroleum spill site.

- MTBE, a common gasoline additive, was detected at concentrations that exceeded NYSDEC Class GA Groundwater Standards at monitoring wells LMW-01 and MW-02. LMW-01 is located within the northeast corner of Tax Lot 3, directly downgradient of an Exxon/Mobil Service Station. Based on the review of NYSDEC records, there have been at least three petroleum spills that have occurred at this service station. In 2003, a subsurface investigation conducted at the service station on behalf of the ExxonMobil Refining and Supply Company identified up to 3 feet of free-phase petroleum in on-site monitoring wells, and an off-site BTEX groundwater plume migrating in a southerly direction towards Tax Lot 3. In addition, strong petroleum-like odors were detected emanating from the borehole during the completion of soil boring SB-15, also located downgradient of the service station. This information indicates that on-site groundwater, as well as soil vapor, is being impacted by a petroleum contaminant plume migrating from the Exxon/Mobil Service Station.

- Analysis of samples collected from the groundwater monitoring wells indicates exceedances of NYSDEC Class GA Groundwater Standards for metal concentrations within all on-site wells. Elevated cyanide concentrations were encountered in MW-02, MW-04, LMW-03 and LMW-04 with a maximum cyanide concentration of 282 ug/l observed at monitoring well MW-04 located within the central portion of Tax Lot 3.

Human Health Exposure Assessment

- Based on current conditions and use of the site, exposure to MGP contaminants would not be expected for most on-site and off-site receptors. Currently Tax Lot 3 is entirely paved and, therefore, direct exposure to subsurface contaminants would not be expected under normal conditions.

- While groundwater exhibited VOCs, SVOCs, cyanide and metals in excess of NYSDEC Class GA Groundwater Standards, direct exposure to contaminated groundwater is not expected since groundwater is not used for potable or non-potable uses. Groundwater within Tax Lot 3 represents a potential contaminant source to the Hudson River. While the Hudson River is not used as a potable water source in the vicinity of the site, it is used for recreational purposes. Therefore, there is a limited potential for the exposure of off-site receptors to site-related contaminants via a surface water exposure pathway.

- There are plans to construct an apartment building on Tax Lot 3 in the near future. Figure 5-1 provides the approximate "footprint" of the proposed apartment building along with the limits of an associated below grade parking garage and basement area. The proposed below grade garage and foundation footings will require soil excavation to a depth of up to 15 feet below grade. As a result, excavation of subsurface soil and groundwater containing relatively high concentrations of VOCs, SVOCs, metals and cyanide will be required. Therefore, appropriate health and safety measures will be implemented during excavation and foundation construction activities to prevent the exposure of on-site workers to contaminated subsurface soil and groundwater. In addition, windblown dust and soil vapors will be controlled during the excavation activities in order to eliminate the potential exposure of off-site receptors to MGP contaminants.

- As shown on Figure 5-1, the design of the apartment building within Tax Lot 3 calls for the construction of a parking garage that will be located partially below the water table. Therefore, in order to prevent contaminated groundwater or volatilized contaminants from seeping into this area, the design of the foundation includes the installation of a vapor control/waterproofing system.

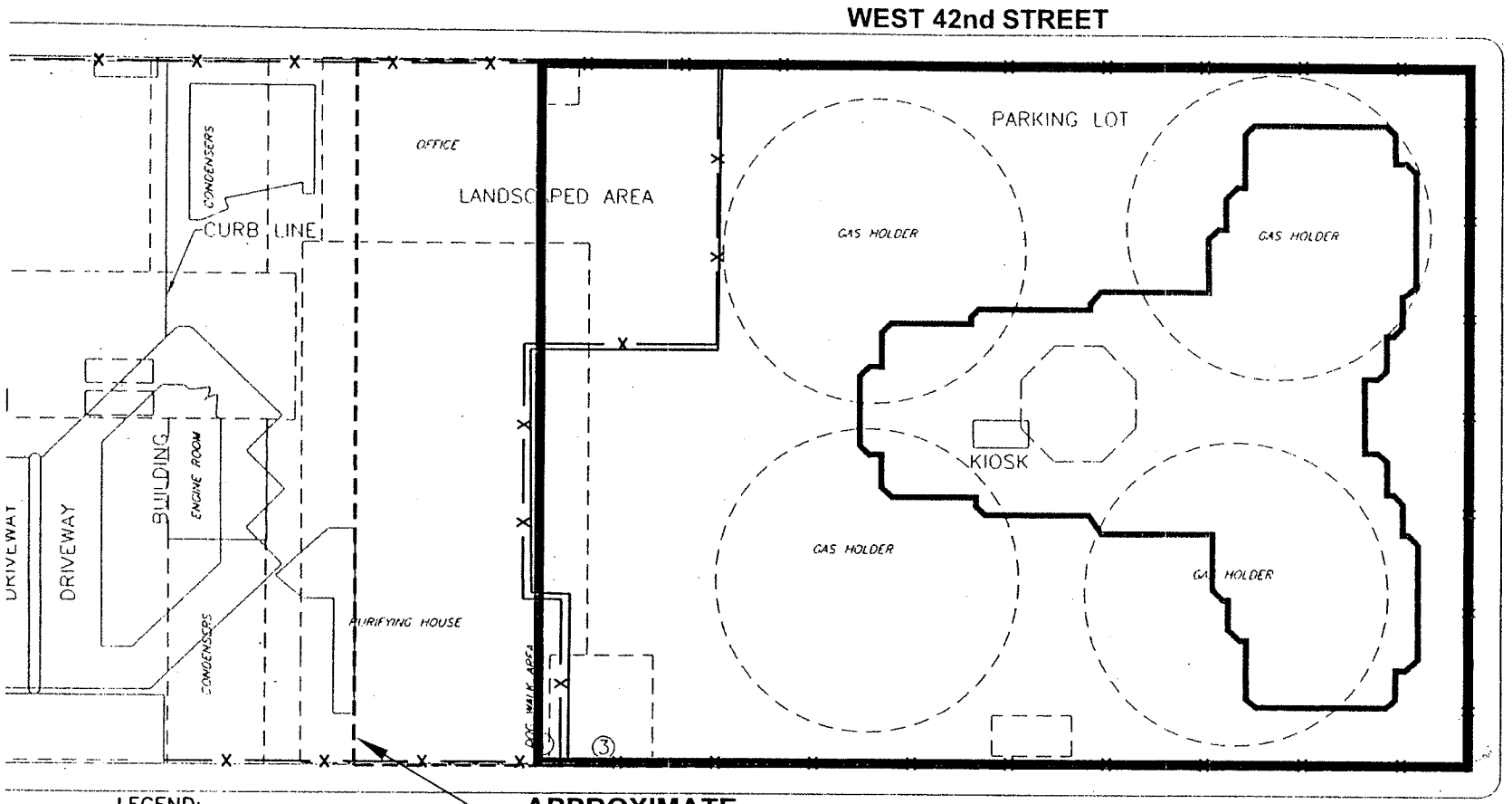
Recommendations

- Based on available soil and groundwater data and information on well construction, it appears that existing wells LMW-03 and LMW-04 could be serving as a pathway for MGP-related contaminants to vertically migrate from within and below the former holder foundations and into the underlying Clay and sand/weathered Bedrock Units. Therefore, it is recommended that these wells be abandoned in accordance with NYSDEC protocols by overdrilling the well casing and screen and sealing off the bore hole annulus with a cement bentonite grout mixture prior to construction of the new building.

- In addition, although the remedial action has not yet been determined, the construction of the apartment building on Tax Lot 3 should include:

  - A health and safety plan designed to prevent exposure of construction workers and off-site receptors to MGP-contaminated material during construction of the new apartment building. A soil management plan to ensure that, as part of the construction, all MGP-contaminated materials are characterized, handled, staged, transported and disposed in accordance with all relevant federal, state and local regulations.

  - A dewatering management plan to ensure MGP-impacted groundwater generated during dewatering operations as part of the building construction is characterized, treated and discharged in accordance with all relevant federal, state and local regulations.



SOURCE: MAP PROVIDED BY CONSOLIDATED EDISON. APPROXIMATE LOCATIONS OF FORMER MGP STRUCTURES BASED ON INTERPRETATION OF SANBORN MAPS AND DRAWINGS PROVIDED BY CONSOLIDATED EDISON CONTAINED WITHIN THE WEST 42nd STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT BY PARSONS, DATED AUGUST 2002 AND THE RIVER PLACE PHASE II, 42nd STREET AND ELEVENTH AVENUE, GEOTECHNICAL ENGINEERING STUDY BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, P.C., DATED JULY 2000. REFERENCED CELL PLAN BY COSTAS KONDYLIS AND PARTNERS, LLP, ARCHITECTS, FOUNDATION PLAN, DRAWING NO. FS-100, FS-300

SCALE: 1"=50'

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
WEST 42ND STREET
FORMER MANUFACTURED GAS PLANT SITE

PROPOSED TAX LOT 3 CONSTRUCTION FOOT PRINT FOR APARTMENT BUILDING

FIGURE 5-1

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- Support piles for the building will be installed using methods that will minimize the potential for downward migration of MGP contamination.

- Integration of a vapor control/waterproofing system into the construction of the new apartment building.

The development of Tax Lot 3 can be conducted independent of the recommended field investigations to be completed in the vicinity of Tax Lot 1.

6.0 REFERENCES

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12. Woodward-Clyde Associates, L.P., *Results of Environmental Investigations and Plan for Additional Investigations,* September 19, 1995, Prepared for Silverstein 42nd Associates, L.P.

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APPENDIX A

FIELD PROGRAM TEST PIT/BORING LOGS AND WELL COMPLETION REPORTS

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Site Id: TP-01

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/14/03 - 08/14/03

Total Depth: 8.00'

Elevation: 8.99'

Datum: Mean Sea Level

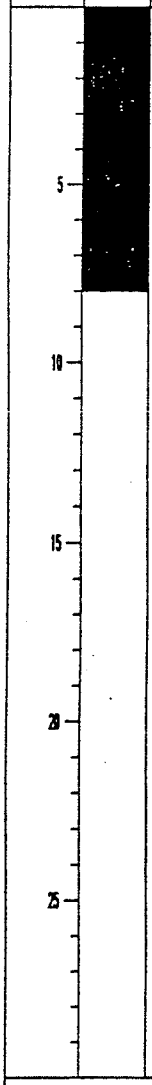
Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Remarks: Sample selected for analysis from 5-5.5'.
Total surface area of test pit = 120 sq ft.



Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
		0-2'	0.0 ppm		0.1' asphalt, to 0.75' reinforced concrete Dark brown-black, med-coarse sandy FILL, concrete, brick, some mica schist cobbles, loose, moist
		2-4'	0.0 ppm		Same as above
5		4-6'	0.0 ppm		
		6-8'	0.0 ppm		Same as above, wet - water encountered throughout at 8'
					Base of test pit - 8 ft.
					Note: No structures encountered within test pit. Water encountered at 8' below grade was murky but exhibited no sheen or NAPL. 8" pipe encountered in eastern end of test pit running north-south at 4' below grade. Soil sample was collected at approximately 5' below grade from stained material along southern wall of test pit.

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Site Id: TP-02

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/12/03 - 08/13/03

Total Depth: 10.00'

Remarks: Sample selected for analysis from 9-9.5'.
Total surface area of test pit = 334 sq ft.

Elevation: 8.66'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
5		0-2'	0.0 ppm		0.25' asphalt
		2-4'	0.0 ppm		Dk brown, med-coarse sandy FILL w/some cobbles, crushed brick/concrete, loose, moist
		4-6'	0.0 ppm		Dk brown, med-coarse sandy FILL w/some cobbles, brick, abandoned pipe, trace wood, loose, moist
		6-8'	0.0 ppm		Dk brown, sandy clayey FILL, some brick, wood, some black staining, slight hydrocarbon-like odor, loose-dense, moist
10		8-10'	11.9 ppm		Dk brown-black, coarse sandy clayey FILL, some wood, black staining, slight hydrocarbon-like odor, dense, moist-wet
					Base of test pit - 10 ft.
15					Note: Two brick walls running north-south encountered at 4' and 6' below grade approximately 5' apart. A concrete foundation was encountered between the two walls at 9.8' below grade. Dark water with a slight sheen was encountered on the concrete. A soil sample was collected on top of the concrete foundation. A 12" pipe was encountered at 3.5' below grade about 6-12" east of brick wall. I-beam located at far eastern end of excavation.
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Site Id: TP-03

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/19/03 – 08/19/03

Total Depth: 10.00'

Elevation: 9.31'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Remarks: Sample selected for analysis from 3.5–4'.
Total surface area of test pit = 326.5 sq ft.

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
		0–2'	0.0 ppm		0.25' asphalt, to 0.5' reinforced concrete
		2–4'	0.0 ppm		Lt brown, med sandy FILL, trace pebbles and asphalt, loose, moist
		4–6'	0.0 ppm		Same as above, trace brick, light gray staining
5		6–8'	0.0 ppm		Same as above
		8–10'	0.0 ppm		Same as above, large boulders, cut rock w/cemented brick
					Same as above, wet
10					Base of test pit – 10 ft.
15					Note: 9" thick concrete slab encountered at 3.5' below grade at northern end of the test pit approximately 12' north of the kiosk. Soil not impacted above or below the slab. 5" thick concrete wall encountered at western wall of test pit 2' below grade. Water encountered at approximately approximately 10' feet below grade. Soil sample collected at 3.5–4' below grade from above the slab.
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Site Id: TP-04

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/13/03 - 08/18/03

Total Depth: 10.00'

Elevation: 9.35'

Datum: Mean Sea Level

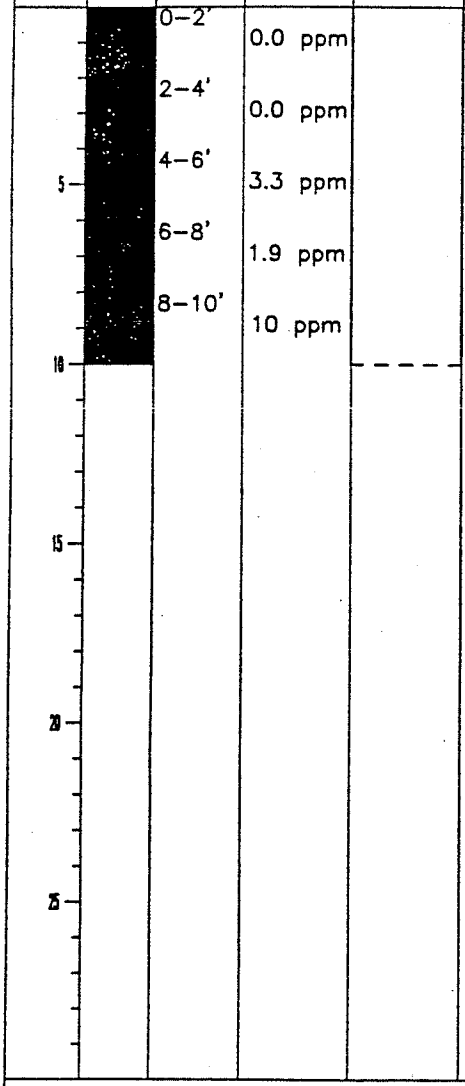
Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Remarks: Sample selected for analysis from 8-8.5'.
Total surface area of test pit = 245 sq ft.



Material Description

0.1' asphalt, to 0.5' concrete
Dk brown-black, med-coarse sandy FILL, some brick, concrete, wood and mica schist boulders, slight hydrocarbon-like odor, loose, moist
Same as above, strong hydrocarbon-like odor, wet

Dk brown-black, m-c sandy FILL, scattered wood, brick conglomerate, some concrete and mica schist boulders, strong HC-like odor, loose, wet
Dk brown-black, m-c sandy FILL, wood, some brick, concrete and mica schist boulders, some staining, strong hydrocarbon-like odor, loose, wet
Base of test pit - 10 ft.

Note: A pipe with wires was encountered at approximately 2.8' below grade. A 2x8' board was encountered at 4' below grade at easternmost end of test pit and exhibited a strong hydrocarbon-like odor and a PID reading of 191 ppm. Murky water encountered at eastern end of test pit at 8-10' below grade with no sheen or NAPL. Soil sample collected at 8-8.5' below grade from stained soil around wood debris at eastern end of test pit.

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Site Id: TP-05

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/20/03 - 08/20/03

Total Depth: 11.50'

Remarks: Sample selected for analysis from 11-11.5'.
Total surface area of test pit = 200 sq ft.

Elevation: 10.27'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
5		0-2'	0.0 ppm		0.7' concrete
		2-4'	3.0 ppm		Brown, m-c sandy FILL, trace concrete, brick, pebbles, loose, moist
		4-6'	4.0 ppm		Same as above, weak naphthalene-like odor, dense
		6-8'	8.0 ppm		Same as above
		8-10'	11 ppm		Same as above
10		10-11.5'	12 ppm		Same as above
					Base of test pit - 11.5 ft.
15					Note: Wall comprised of wood sheeting encountered at easternmost end of test pit. Naphthalene-like odor from excavation and soil pile.
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Site Id: TP-06

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/21/03 - 08/22/03

Total Depth: 10.00'

Elevation: 10.62'

Datum: Mean Sea Level

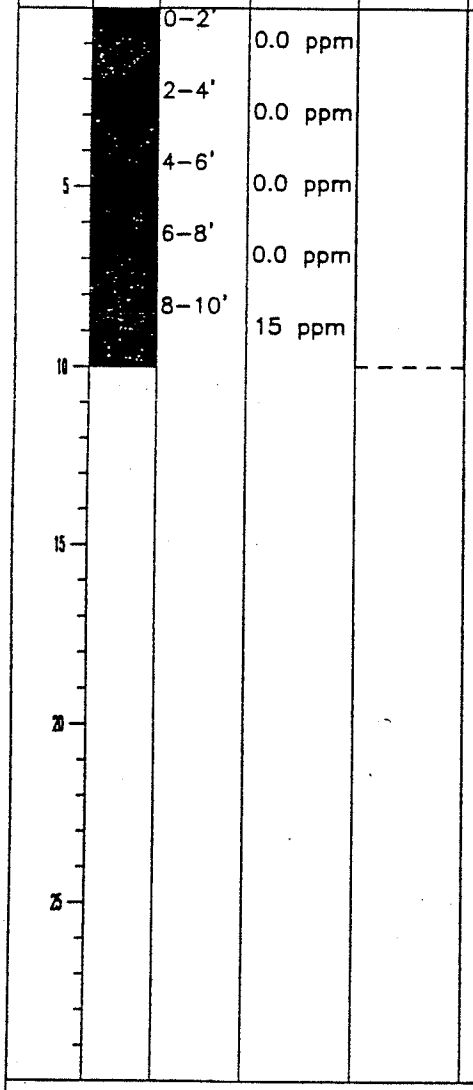
Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Remarks: Sample selected for analysis from 9.5-10'.
Total surface area of test pit = 140 sq ft.



Material Description

0.1' asphalt, to 0.5' concrete
Br-bk, m-c sandy FILL, trace brick, concrete, pebbles, loose, moist-dry
Brown, medium-coarse sandy FILL, some brick, trace concrete and pebbles, loose, moist
Same as above
Same as above

Black, medium-coarse sandy silty FILL, trace brick, concrete and boulders, slight hydrocarbon-like odor, slight sheen on water, dense, wet
Base of test pit - 10 ft.

Note: Horizontal brick wall encountered throughout southwest portion of test pit at 2' below grade. Wall assumed to be top of collapsed holder wall. Steel pipe encountered at southern end of test pit, east of brick wall.

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Site Id: TP-07

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/19/03 - 08/20/03

Total Depth: 10.50'

Remarks: Sample selected for analysis from 10-10.5'.
Total surface area of test pit = 312 sq ft.

Elevation: 9.58'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
5		0-2'	0.0 ppm		0.25' asphalt Brown, medium-coarse sandy FILL, some brick, concrete, pebbles and boulders, brick layer at 1-2', loose, moist
		2-4'	0.0 ppm		Same as above, no brick layer
		4-6'	0.0 ppm		Black, medium-coarse sandy FILL, peat, some clay and organic material, some brick, pebbles, loose-dense, moist-wet
		6-8'	0.0 ppm		Same as above, wet
10		8-10.5'	0.0 ppm		Base of test pit - 10.5 ft.
15					Note: Brick wall encountered at southern end of test pit running from northeast to southwest with an apparent southeast bend. A concrete foundation was encountered south and above the brick wall. 12" metal pipe located just outside the brick wall, vertical in direction. Top was removed and pipe was observed to be filled with water. An observation sample of the water indicated a strong naphthalene-like odor, however, little to no sheen and no NAPL was observed. Soil sample was collected at 10-10.5' below grade next to the brick wall.
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Site Id: TP-08

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/21/03 - 08/21/03

Total Depth: 11.00'

Remarks: Sample selected for analysis from 10.5-11'.
Total surface area of test pit = 224 sq ft.

Elevation: 10.31'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
		0-2'	0.0 ppm		0.7' concrete Br, med-coarse sandy FILL, trace brick, boulders, concrete, loose, moist
		2-4'	0.0 ppm		Same as above, pipe debris
		4-6'	82.9 ppm		Brown-gray, med-coarse sandy FILL, trace brick, boulders, concrete, staining, strong naphthalene-like odor, loose-dense, wet
5		6-8'	36.5 ppm		Brown-gray, silty fine-coarse sandy FILL, trace brick, boulders, concrete staining, strong naphthalene-like odor, loose-dense, wet
		8-10'	85.5 ppm		Same as above
10		10-11'	99 ppm		Same as above Base of test pit - 11 ft.
15					Note: Concrete wall along western boundary of test pit was encountered 1' below grade. A brick wall was located in the central portion of the test pit up to 3' below grade running east-west. 4" steel pipe encountered 2.5' below grade at both northernmost and southermost ends of test pit.
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Site Id: TP-09

Location: West 42nd Street

Purpose: Test Pit

Date(s): 08/19/03 - 08/19/03

Total Depth: 10.50'

Remarks: Sample selected for analysis from 10-10.5'
Total surface area of test pit = 224.5 sq ft.

Elevation: 9.47'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Backhoe

Contractor: Brookside

Borehole Dia.: 0.00in

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
5		0-2'	0.0 ppm		0.7' concrete
		2-4'	0.0 ppm		Brown-black, medium-coarse sandy FILL, some brick, concrete and boulders, loose, moist
		4-6'	0.0 ppm		Same as above, murky water rushed into excavation
		6-8'	0.0 ppm		Same as above, wet from water within excavation
		8-10.5'	0.0 ppm		Same as above
10					Base of test pit - 10.5'
15					Note: No structures found within test pit.
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Site Id: SB-01

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/02/03 - 09/02/03

Total Depth: 32.00'

Elevation: 8.99'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-32'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 22-26' and 26-32'. Unable to obtain PID readings due to heavy precipitation.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.8' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'		18 8 8 7		Brown, fine-medium sandy FILL, trace brick fragments, wet
		7-9'		9 8 6 7		Same as above
		9-11'		7 7 9 5		Brown, medium-coarse SAND, trace schist fragments, wet
10		11-13'		13 6 3 3		Same as above from 11-11.5', to brown-black, medium-coarse SAND, some schist fragments, loose, wet
		13-15'		WH WH 1 1		Brown-black, medium-coarse SAND, some schist fragments, loose, wet
15		15-17'		3 2 2 9		Same as above, slight hydrocarbon-like odor in tip of spoon
		17-19'		9 >100		Black, coarse GRAVEL, schist fragments, some coarse sand, strong hydrocarbon-like odor, wet
						No recovery (boulder from 19-20')
20		20-22'		32 30 17 11		Black, silty CLAY, some wood and peat, slight hydrocarbon-like odor, dense, wet
		22-24'		17 11 8 6		Black, silty CLAY, some peat, trace wood, slight hydrocarbon-like odor, dense, wet
25		24-26'		WH 1 1 2		Black, silty CLAY, slight sheen, slight hydrocarbon-like odor, dense, wet
		26-28'				Gray, CLAY, slight hydrocarbon-like odor, dense, wet
		28-30'		12 12 21 71		Brown, coarse SAND, some rock fragments, slight hydrocarbon-like odor, loose, wet

Location: West 42nd Street	Site Id: SB-01
Purpose: Soil Boring	Total Depth: 32.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		30-32'		6 8 >100		Brown, coarse SAND, some schist, loose, wet (bedrock at 30.4') Base of boring – 30.4 ft.

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Site Id: SB-02

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/03/03 - 09/22/03

Total Depth: 33.00'

Elevation: 8.93'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: HA from 0-5' HSA from 5-19' MR 19-33'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 17-19' and 29-31'. Unable to obtain PID readings due to heavy precipitation.
WH:Weight of Hammer HA:Hand Auger
HSA: Hollow Stem Auger MR:Mud Rotary

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.2' asphalt, to 0.75' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'		6 4 24 10		Dark brown, coarse sandy FILL, trace brick fragments, loose, moist
		7-9'		8 14 11 9		Same as above, trace mica-schist fragments
10		9-11'		1 2 1 2		Dark brown, medium sandy FILL, loose, moist
		11-13'		2 6 4 4		Same as above, wet
		13-15'		3 3 2 2		Black, fine sandy FILL, some brick, dense, wet
15		15-17'		2 2 4 2		Same as above
		17-19'	800 ppm	WH WH 2 49		Black, silty FILL w/fine sand, trace concrete, slight-moderate naphthalene-like odor, dense, wet (gas holder foundation at 19')
20		20-22'	92.2 ppm	4 9 25 50		Gray-black, coarse SAND, some silt, some wood, strong naphthalene-like odor, dense, wet
		23-25'		WH 1 2 1		No recovery
25		25-27'	0.2 ppm	WH		Gray, CLAY, dense, wet
		27-29'	0.0 ppm	WH WH 1 3		No recovery, trace shells on split spoon
		29-31'	0.0 ppm	9 12		Gray, fine SAND, some silty clay, loose, wet

Location: West 42nd Street	Site Id: SB-02
Purpose: Soil Boring	Total Depth: 33.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		31-33'	0.0 ppm	24 55 90 >100		Gray, coarse SAND and GRAVEL, some weathered bedrock, loose, wet (bedrock at 31.6') Base of boring - 31.6 ft.

Dvirka and Bartilucci
CONSULTING ENGINEERS
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Site Id: SB-03

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/04/03 – 09/05/03

Total Depth: 19.00'

Elevation: 8.93'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0–5' HSA from 5–19'

Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Sample selected for analysis at 17–19'. SB-03 was stopped at 19' (bottom of gas holder) as per work plan, but was continued as SB-28 downgradient and within the landscaped area. WH:Weight of Hammer

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
0		0–5'				0.8' reinforced concrete FILL, topsoil, brick, concrete
5		5–7'	0.0 ppm	3 3 3 3 3		Brown, medium–coarse sandy FILL, some mica, loose, moist
		7–9'	3.8 ppm	7 5 9 7 17		Brown, medium–coarse sandy FILL, some mica schist fragments, dense, moist
10		9–11'	0.0 ppm	10 6 7 14		Brown–gray, coarse sandy FILL, some mica schist fragments, dense, wet
		11–13'	0.0 ppm	4 4 5 2 2		Dark brown, coarse sandy FILL, trace pebbles, loose, wet
		13–15'	0.0 ppm	2 2 2 2 1		Dark brown, medium sandy FILL, mica fragments, loose, wet
15		15–17'	0.0 ppm	1 1 1 1 4		Gray–black, silty sandy FILL, strong hydrocarbon–like odor, loose, wet
		17–19'	1440 ppm	>50		Dk brown–gray, silty sandy FILL from 17–18.2', strong hydrocarbon–like odor, loose, to black, silty FILL w/fine sand, trace concrete in tip, slight–moderate naphthalene–like odor, dense, wet
20						Base of boring – 19 ft. (gas holder foundation at 19')
25						

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Site Id: SB-04

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/18/03 - 09/18/03

Total Depth: 32.90'

Elevation: 8.89'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Sample selected for analysis at 10-16'. Completed within TP-02. Moved 13' south of its original proposed location to have equidistant locations along the Purifier House east wall. WH:Weight of Hammer

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-10'	0.0 ppm			0.25' asphalt
			0.0 ppm			Dk brown, med-coarse sandy FILL w/some cobbles, crushed brick/concrete, loose, moist
5			0.0 ppm			Dk brown, med-coarse sandy FILL w/some cobbles, brick, abandoned pipe, trace wood, loose, moist
			0.0 ppm			Dk br, sandy clayey FILL, some brick, wood, some black staining, weak odor, loose-dense, moist
			11.9 ppm			Dk br-black, coarse sandy clayey FILL, some wood, black staining, weak odor, dense, moist-wet
		10-12'	0.1 ppm	1 1 2		Brown, coarse sandy FILL, some brick fragments, brick in tip of spoon, loose, wet
		12-14'	0.1 ppm	5 6 7 >100		Black, GRAVEL w/wood, loose, wet
		14-16'	0.0 ppm	8 7 6 7		Black, medium-coarse SAND, some wood, trace silt, dense, wet
15		16-18'	0.0 ppm	4 3 3 2		Gray-black, CLAY, some silt, dense, wet
		18-20'	0.0 ppm	WH WH 2 3		Same as above, trace seashells
		20-22'	0.2 ppm	WH WH 2 2		Gray, medium sandy CLAY, trace seashells, dense, wet
		22-24'	0.0 ppm	WH		Gray, silty CLAY, trace seashells, dense, wet
		24-26'	0.0 ppm	WH WH 3 3		Same as above
25		26-28'	0.0 ppm	WH		Same as above
		28-30'	0.0 ppm	WH >100		Same as above from 28-28.5', to gray-bk, coarse SAND w/mica schist fragments, loose, wet (bedrock at 28.8')

Location: West 42nd Street	Site Id: SB-04
Purpose: Soil Boring	Total Depth: 32.90'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
						Mica schist in rock core
						Base of boring – 32.9 ft.

Dvirka and Bartilucci CONSULTING ENGINEERS
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Site Id: SB-05

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/09/03 - 09/09/03

Total Depth: 20.00'

Elevation: 9.06'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Sample selected for analysis at 18-19.5'. SB-05 was moved from its original proposed location to within TP-03 in order to avoid the kiosk. Split spoon sampling started at 10'. WH:Weight of Hammer

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-10'	0.0 ppm			0.25' asphalt, to 0.5' reinforced concrete
			0.0 ppm			Lt brown, medium sandy FILL, trace pebbles and asphalt, loose, moist
			0.0 ppm			Same as above, trace brick, light gray staining
5			0.0 ppm			Same as above
			0.0 ppm			Same as above, large boulders, cut rock w/cemented brick
			0.0 ppm			Same as above, wet
10		10-12'	0.0 ppm	WH WH		Brown, coarse sandy FILL, trace mica, loose, wet
		12-14'	0.0 ppm	4 2 WH		Brown-black, coarse sandy FILL, trace schist, dense, wet
		14-16'	0.0 ppm	1 13 11 1		Brown, coarse-medium sandy FILL, loose, wet
15		16-18'	0.0 ppm	2 4 2 8		Same as above from 16-16.5', brick from 16.5-17', wet
		18-20'	299 ppm	48 21 18 3		Black, c sandy FILL, some brick, sheen, strong naphthalene-like, odor loose, wet (gas holder foundation at 19.5')
20				4 5 >100		Base of boring - 19.5 ft.
25						

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Site Id: SB-06

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/09/03 - 09/09/03

Total Depth: 33.00'

Elevation: 8.47'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-33'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Sample selected for analysis at 9-11'.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.25' asphalt, to 0.75' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.1 ppm	10 7 5 3		Light brown, fine-medium sandy FILL, trace concrete, loose, dry
		7-9'		4 4 6		No recovery
		9-11'	1.5 ppm	4 3 10		Black, silty SAND, dense, wet
10		11-13'	1.8 ppm	8 4 WH		Gray, CLAY, moderately plastic, moist
		13-15'	5.3 ppm	WH 7		Gray-black, CLAY, dense, moist
15		15-17'	2.5 ppm	1 3 4 6		Black, silty SAND, trace mica, wet
		17-19'	4.8 ppm	3 3 3 3		Black, silty CLAY, trace mica schist fragments, slight naphthalene-like odor, wet
		19-21'	3.5 ppm	WH 1 2		Black, silty CLAY from 19-20.8', loose, wet, to gray, CLAY from 20.8-21', dense, wet
20		21-23'	2.0 ppm	2 WH		Gray, CLAY, dense, wet
		23-25'	0.5 ppm	WH		Same as above
25		25-27'	0.2 ppm	WH		Same as above, trace seashells
		27-29'	0.1 ppm	WH		Same as above
		29-31'	0.2 ppm	WH		Gray, silty CLAY, moderately plastic, wet

Location: West 42nd Street	Site Id: SB-06
Purpose: Soil Boring	Total Depth: 33.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		31-33'	0.2 ppm	3 3 5 9 11 >50		Gray, sandy CLAY, some mica schist, loose, wet (bedrock at 32.8') Base of boring - 32.8 ft.

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Site Id: SB-07

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/03/03 - 09/04/03

Total Depth: 40.00'

Elevation: 9.22'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: HA from 0-5' HSA from 5-35' RC 35-40'

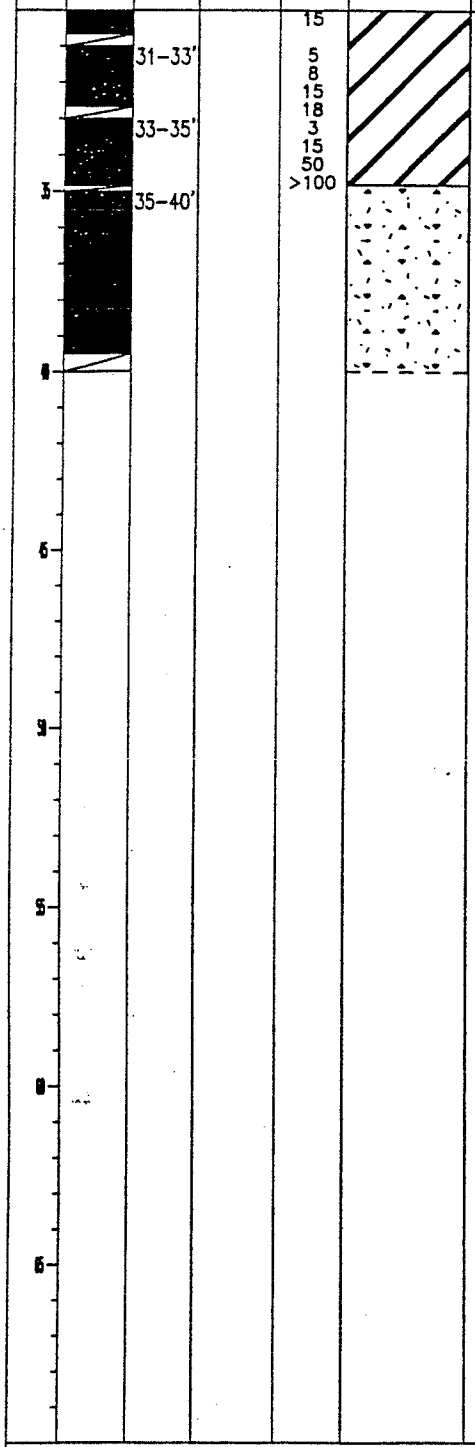
Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 27-29' and 33-35'. Unable to obtain PID readings throughout most of boring due to heavy precipitation.
WH:Weight of Hammer HA:Hand Auger
HSA:Hollow Stem Auger RC:NX Rock Core

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.5' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'		1 6 9		Black, silty FILL w/fine sand and clay, slight hydrocarbon-like odor, dense, wet
		7-9'		5 4 1		Black, silty FILL w/fine sand, slight hydrocarbon-like odor, dense, wet
		9-11'		4 6 4		Same as above, some schist fragments from 9.7-9.8'
10		11-13'		21 8 4 WH		Gray, silty clayey FILL, loose, wet
		13-15'		WH 2 4		Gray, silty FILL w/fine sand, loose, wet
15		15-17'		1 WH WH		Gray, silty FILL w/fine-coarse sand, loose, wet
		17-19'		3 2 1		Same as above, w/black tar-like band at bottom of split spoon (gas holder foundation at 18.5')
		19-21'		2 2 76		Gray, silty CLAY, strong hydrocarbon-like odor, dense, wet
20		21-23'	23 ppm	2 1 1 3 17		Gray, silty SAND, trace wood, slight-moderate naphthalene-like odor, dense, wet
		23-25'		18 5 6		No recovery
25		25-27'	38 ppm	1 1 2 1 WH		Gray, CLAY, trace wood, slight naphthalene-like odor, wet
		27-29'	41 ppm	WH 1 1 1 2		Gray, silty CLAY, trace wood, slight naphthalene-like odor, loose, wet
		29-31'		1 1 1/1' 1		Same as above

Location: West 42nd Street	Site Id: SB-07
Purpose: Soil Boring	Total Depth: 40.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in



Material Description

Gray, CLAY, trace wood, trace weathered bedrock, dense, wet

Gray, CLAY from 33–34.5', GRAVEL (mica schist fragments) from 34.5–34.8', dense, wet (bedrock at 34.8')

(NX Rock Core from 35–40')

Dark gray, mica schist from 35–35.8', to milky white, pegmatite from 35.8–39.5'

Base of boring – 39.5 ft.

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Site Id: SB-08

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 10/02/03 - 10/02/03

Total Depth: 30.00'

Elevation: 6.78'

Datum: Mean Sea Level

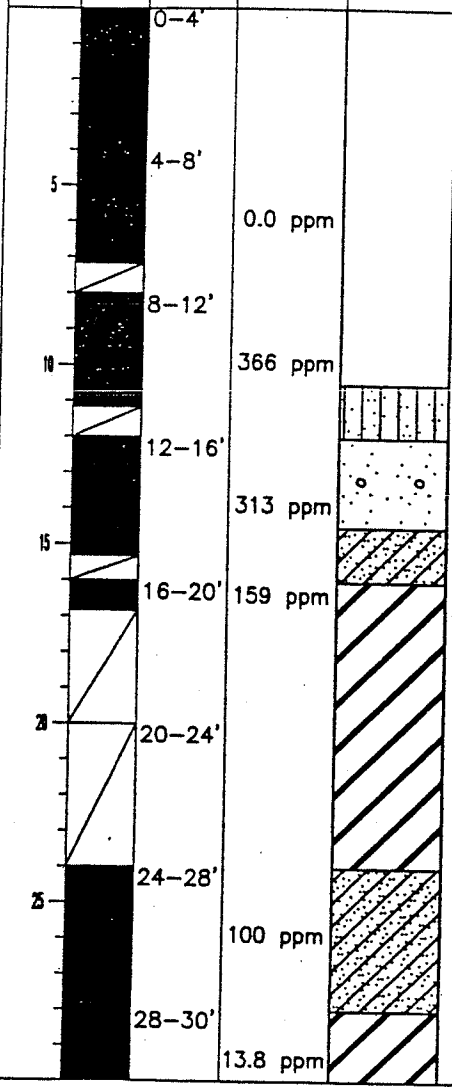
Logged By: K. Panella

Drilling Method: HA from 0-4' GP from 4-30'

Contractor: Jersey Boring

Borehole Dia.: 2.00in

Remarks: Samples selected for analysis at 12-16' and 28-30'. Moved from original location to the south tip of the walking path in the landscaped area.
WH:Weight of Hammer HA:Hand Auger
GP:Geoprobe



Material Description

FILL, topsoil, stone dust, brick, concrete

Light brown, medium-coarse sandy FILL, some brick, trace mica schist fragments, loose, moist

Same as above from 8-10.5', wet

Black, fine SAND, some silt, sheen, strong naphthalene and hydrocarbon-like odors, loose, wet

Black, coarse SAND from 12-14.5', some gravel, sheen, strong naphthalene-like odor, loose, wet

Black-gray, CLAY, some silty fine sand, moderate naphthalene-like odor, dense, wet

Black-gray, silty CLAY, slight sheen, moderate naphthalene-like odor, moderately plastic, wet

No recovery

Black-gray, silty SAND, some clay, slight sheen, mod naphthalene-like odor, wet

Gray, CLAY, tr silt and seashells, naph.-like odor, mod plastic, wet

Base of boring - 30 ft. (bedrock at 30')

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Site Id: SB-09

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/05/03 - 09/05/03

Total Depth: 35.00'

Elevation: 9.55'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-35'

Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Samples selected for analysis at 11-15' and 31-33.5'.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.75' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	8 6 4 4 7 6 5 3		Brown, medium SAND, some mica fragments, loose, dry
		7-9'	8.3 ppm			Dark brown-black, medium SAND, some mica fragments, slight hydrocarbon-like odor, dense, moist
10		9-11'	1.3 ppm	4 2 1 1 3 1 2 4		Black, silty fine SAND, slight hydrocarbon-like odor, dense, moist
		11-13'	3.5 ppm	12 11		Gray, silty fine SAND, slight hydrocarbon-like odor, dense, moist
		13-15'	2.2 ppm	4 3 1 2		Black, silty fine SAND from 13-13.5', mica fragments from 13.5-14', slight hydrocarbon-like odor, dense, wet
15		15-17'	1.6 ppm	18 23 3 14		Black, silty fine SAND, slight hydrocarbon-like odor, dense, wet
		17-19'	1.5 ppm	20 6		Same as above
		19-21'	2.5 ppm	3 2 4 3		Black-gray, CLAY, trace seashells, slight hydrocarbon-like odor, dense, wet
		21-23'	5.2 ppm	WH 1		Black-gray, CLAY, dense, wet
		23-25'	2.5 ppm	1 WH		Gray, CLAY, trace seashells, trace wood, dense, moist
25		25-27'	0.5 ppm	WH 2 2 2		Same as above
		27-29'	0.6 ppm	WH WH 1 1		Same as above, some seashells
		29-31'	4.7 ppm	WH WH		Gray, silty CLAY, slight hydrocarbon-like odor, dense, wet

Location: West 42nd Street	Site Id: SB-09
Purpose: Soil Boring	Total Depth: 35.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 6.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
5		31-33'	23.4 ppm	2 2 3 3 3 2		Gray, silty fine SAND, slight hydrocarbon-like odor, dense, wet
		33-35'	0.5 ppm			Same as above (bedrock at 33.5')
						Base of boring - 33.5 ft.
4						
5						
5						
5						
6						
6						

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Site Id: SB-10

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/11/03 - 09/11/03

Total Depth: 42.00'

Elevation: 10.38'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: HSA from 0-35' NX Rock Core from 35-42'

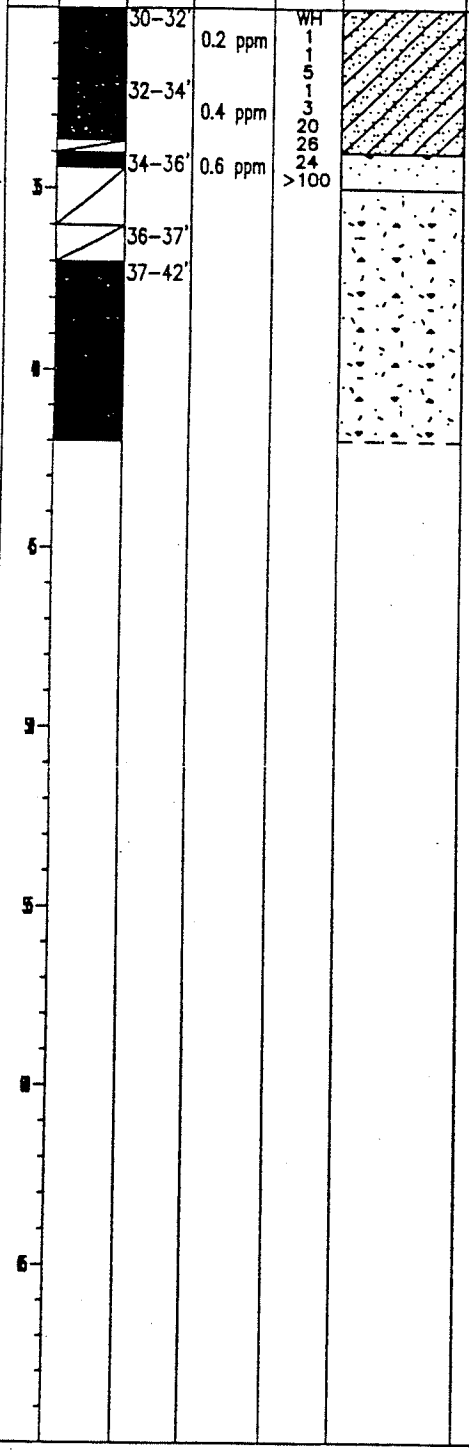
Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Samples selected for analysis at 20-24' and 26-28'. Moved 15' northeast of its original location to within TP-05 in order to avoid car lifts and hydraulic lines.
WH:Weight of Hammer HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-10'	0.0 ppm			0.7' concrete
						Brown, m-c sandy FILL, trace concrete, brick and pebbles, loose, moist
			3.0 ppm			Same as above, weak naphthalene-like odor, dense
			4.0 ppm			Same as above
5						
			8.0 ppm			Same as above
			11.0 ppm			
		10-12'	0.5 ppm	2		Black, silty fine SAND, slight naphthalene-like odor, loose, moist
			12.0 ppm	3 5 7		
		12-14'	1.5 ppm	WH 1 2		Brown-gray, silty CLAY from 12-12.8', moderately plastic, wet, to black, SILT w/coarse sand, slight naphthalene-like odor, loose, wet
		14-16'	4.1 ppm	1 2 1 1 1		Black, fine-medium sandy CLAY from 14-15.7', loose, wet, to gray, silty CLAY, dense, moist
15		16-18'	0.2 ppm	3 2 1 1		Black, coarse SAND and GRAVEL (schist fragments) from 16-16.75', loose, wet, to gray, silty CLAY, dense, moist
		18-20'	0.2 ppm	WH		Gray, CLAY, trace medium sand, trace organic material, dense, moist
		20-22'	6.4 ppm	WH 2 2 3		Gray, medium-coarse SAND, trace silt, trace organic material, loose, wet
		22-24'	6.2 ppm	WH WH 1 1		Gray, medium-coarse SAND from 22-23.7', loose, wet, to gray, silty CLAY, trace organic material, dense, moist
		24-26'	1.2 ppm	WH		Gray, CLAY, trace silt, trace organic material, dense, moist
25		26-28'	0.5 ppm	WH 1 1 2		Gray, CLAY, some silt and fine sand, some organic material, wood, dense, moist
		28-30'	0.5 ppm	WH		Gray, CLAY, trace silt and organic material, very dense, moist

Location: West 42nd Street	Site Id: SB-10
Purpose: Soil Boring	Total Depth: 42.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 6.25in



Material Description

Gray, CLAY, some fine sand, trace organic material, loose, wet
Gray, medium-coarse sandy CLAY, moderately plastic, wet

Gray, fine-medium SAND, some gravel, loose, wet
(bedrock at 35')
(NX Rock Core from 35-42')
Granite

Base of boring - 42 ft.

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Site Id: SB-11

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/10/03 - 09/17/03

Total Depth: 30.00'

Elevation: 9.71'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5'. HSA from 5-30'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Sample selected for analysis at 10-12'.
Moved 17.5' south of its original location to within TP-07 due to multiple refusals.
WH:Weight of Hammer HSA:Hollow Stem Auger
H2S:Hydrogen Sulfide

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-10'	0.0 ppm	3 3 3 3 4 2 2 2 5 8 11 6 3 2 1 1 2 1 3 4 11 20 40 20 30		0.25' asphalt Brown, med-coarse sandy FILL, some brick, concrete, pebbles and boulders, brick layer at 1-2', loose, moist
			0.0 ppm			Same as above, no brick layer
5			0.0 ppm			Black, medium-coarse sandy FILL, peat, some clay and organic material, some brick, pebbles, loose-dense, moist-wet
			0.0 ppm			Same as above, wet
			0.0 ppm			
10		10-12'	0.0 ppm			Brown-black, fine-medium sandy FILL, some clay, loose, wet
		12-14'				No recovery
		14-16'	0.5 ppm			Dark brown, silty FILL w/medium-coarse gravel, some mica schist, trace fine-coarse sand, loose, wet
15		16-18'	0.0 ppm			Dark brown-black, silty FILL w/medium-coarse sand, trace gravel, loose, wet
		18-20'	0.2 ppm			Dark brown, silty FILL w/medium-coarse gravel, some brick fragments, trace fine-coarse sand, loose, wet
20		20-22'	0.9 ppm			Dark brown, silty FILL w/medium-coarse sand, some fine-coarse gravel, some brick fragments, loose, wet
		22-24'	1.6 ppm	1 1 2 2		Dark brown-black, silty f-c SAND, silty CLAY from 23.5-24', trace f-m gravel, slight organic (H2S-like) odor, loose, wet
		24-26'		WH		Dark brown-black, silty f-c SAND, trace silty clay, trace gravel, trace organic material, slight organic (H2S-like) odor, wet
25			0.0 ppm			Gray, CLAY, some silt, dense, wet
		26-28'	0.3 ppm	WH 2		Same as above, some gravel (bedrock at 29.1')
		28-30'	0.2 ppm	WH >100		Base of boring - 29.1 ft.

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Site Id: SB-12

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/08/03 - 09/08/03

Total Depth: 29.00'

Elevation: 9.95'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-29'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 21-23' and 27-28.8'.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.75' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	3 3 4 5 3 3 3 3		Brown-gray, coarse sandy FILL, some mica schist, loose, dry
		7-9'	0.3 ppm			Brown-black, coarse sandy FILL, trace mica fragments, loose, dry
		9-11'	0.4 ppm	2 3 3 3 3 4 7 5		Brown-black, sandy CLAY, dense, wet
		11-13'	0.3 ppm	6 13 6 3 3 WH WH		Gray, CLAY, dense, moist
		13-15'	0.5 ppm			Black-gray, sandy CLAY, trace mica schist fragments, slight hydrocarbon-like odor, dense, wet
		15-17'	27.5 ppm	3 1 4 5 6 5 WH		Black-gray, sandy CLAY, slight naphthalene-like odor, dense, wet
		17-19'	8.5 ppm			Same as above
		19-21'	27.9 ppm	3 4 5 7 3 3 WH		Black-gray, silty SAND, slight naphthalene-like odor, dense, wet
		21-23'	32.6 ppm			Gray-black, CLAY, moderate naphthalene-like odor, dense, wet
		23-25'	13.1 ppm	WH 1 1 WH WH		Gray, CLAY, dense, moist
		25-27'	19.5 ppm	14 14 4 1 4 >50		Same as above
		27-29'	4.5 ppm			Gray, sandy CLAY, mica schist at 28.8', dense, moist (bedrock at 28.8') Base of boring - 28.8 ft.

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Site Id: SB-13

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/16/03 - 09/16/03

Total Depth: 23.00'

Elevation: 10.68'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-23'

Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Sample selected for analysis at 19-21.4'.
Moved 35' east of its original proposed location in order to avoid hydraulic lifts.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.5' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	1 2 3 3		Brown-black, medium-coarse sandy FILL, trace silt and gravel, loose, moist
		7-9'	0.5 ppm	3 1 6 28		Brown, fine sandy FILL, some silt, trace gravel, loose, moist
		9-11'	0.1 ppm	7 5 4 3		Brown, fine sandy FILL, some silt, trace gravel, trace brick, loose, wet
10		11-13'	0.2 ppm	5 4 5 13		Black, gravelly FILL, some fine sand, some silt, wet
		13-15'	1.5 ppm	4 9 6 6		Brown-gray, fine sandy FILL, some silt, trace gravel, slight hydrocarbon-like odor, loose, wet
15		15-17'	1.7 ppm	4 2 3 9		Gray, fine-medium sandy FILL, some silt and clay, trace gravel, loose, wet
		17-19'	0.0 ppm	5 15 17 12		Gray, clayey FILL, some silt, some brick, dense, wet
		19-21'	9.9 ppm	3 3 4 4		Same as above, slight naphthalene-like odor
20		21-23'	1186 ppm	>100		Gray, clayey FILL, some silt, 1" band of black tar-like clay, concrete in tip of spoon, strong naphthalene-like odor, wet
						(gas holder foundation at 21.4')
						Base of boring - 21.4 ft.
25						

Dvirka and Bartilucci CONSULTING ENGINEERS
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Site Id: SB-14

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/12/03 - 09/15/03

Total Depth: 56.00'

Elevation: 10.07'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: HA from 0-5' HSA from 5-51' RC 51-56'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 17-19' and 30-32'.
WH:Weight of Hammer HA:Hand Auger
HSA:Hollow Stem Auger RC:NX Rock Core

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.5' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.3 ppm	9 20 28 14		Brown, coarse sandy FILL, some gravel, brick fragments, loose, dry
		7-9'	0.3 ppm	9 >100		Brown-gray, silty FILL w/clay, trace wood, 1" of shale in tip of spoon, dense, moist
10		9-11'	0.3 ppm	WH 2 6 3		Brown-gray, silty FILL w/clay, some gravel (mica schist, shale), dense, moist
		11-13'	0.4 ppm	8 12 11 8		Brown-gray, silty FILL w/clay, some mica schist fragments, dense, moist
		13-15'	1.6 ppm	9 20 38 40		Brown-gray, coarse sandy FILL, some silt and gravel, some mica schist, trace brick, slight naphthalene-like odor, wet
15		15-17'	0.4 ppm	1 14 37 12		Same as above, some brick, trace concrete
		17-19'	70 ppm	49 21 6 >50		Brown-gray-black, m-c sandy FILL, some silt, slight-strong naphthalene-like odor, concrete in tip of spoon, wet (gas holder foundation at 19', drilled through to 21')
20		19-21'				
		21-23'	65 ppm	5 6 34 72		Br-bk, c sandy FILL, some silt and gravel, naph.-like odor, wet, to bk, FILL, wood w/tar staining and strong naph.-like odor, wet (hard material from 22-28')
		24-26'		2 2 2 1		No recovery, trace wood
25		26-28'		2 5 6 6		No recovery, trace wood
		28-30'	0.0 ppm	WH		Gray, SILT, some wood, loose, wet

Location: West 42nd Street	Site Id: SB-14
Purpose: Soil Boring	Total Depth: 56.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		30-32'	0.0 ppm	8 20 30 50		Gray-br, CLAY, some silt and c sand, trace gravel, dense, wet
		32-34'	0.0 ppm	6 10 16 17		Gray-brown, CLAY, some silt, trace medium sand, dense, wet Gray, CLAY, trace silt, dense, wet
35		34-36'	0.0 ppm	8 16 35 30		
		36-38'	0.0 ppm	17 25 37 61		Same as above, trace gravel
		38-40'	0.0 ppm	20 75 70 23		Gray, CLAY, trace silt, weathered bedrock in tip of spoon, dense, wet
40		40-42'	0.0 ppm	40 53 87 75		Gray, CLAY, trace silt and gravel, dense, wet
		42-44'	0.0 ppm	50 52 60 65		Brown, medium-fine SAND, some gravel, trace mica schist, dense, wet
		44-46'	0.0 ppm	34 82 >100 >100		Brown, medium-coarse SAND, some gravel, dense, wet
45		46-48'	0.0 ppm	34 73 96 >100		Brown, m-c SAND, some gravel, some weathered bedrock (mica schist), dense, wet
		48-50'	0.0 ppm	60 >100		Brown, medium-coarse GRAVEL, some silt, trace fine-coarse sand, some weathered bedrock (mica schist), dense, wet
50		50-52'	0.0 ppm	55 >100		Brown, medium-coarse GRAVEL, some silt, trace fine-coarse sand, some weathered bedrock (pegmatite), dense, wet (bedrock at 50.8') White/light gray granite in core
		52-56'				
55						Base of boring - 56 ft.
60						

Dvirka and Bartilucci CONSULTING ENGINEERS
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Site Id: SB-15

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/12/03 - 09/12/03

Total Depth: 19.00'

Elevation: 9.80'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-19'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 7-9' and 13-15'. Boring was terminated at 19' at bottom of gas holder as per work plan.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.5' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	1309 ppm	23 45 50		Brown, coarse sandy FILL, some coarse gravel, some mica schist, strong hydrocarbon-like odor, loose, dry
		7-9'	1787 ppm	27 27 73		Same as above
		9-11'	95 ppm	37 41 3		Gray, silty coarse sandy FILL, trace gravel, trace mica schist fragments, strong hydrocarbon-like odor, loose, wet
10				4 5		
		11-13'	5.0 ppm	3 1		Gray, silty clayey FILL, some mica, strong hydrocarbon-like odor, moderately plastic, wet
				6 8		
		13-15'	2.0 ppm	16 18		Gray, coarse sandy FILL, trace gravel, moderate hydrocarbon-like odor, loose, wet
				14 7		
15		15-17'	3.1 ppm	7 4		Same as above
				4 8		
		17-19'	1.9 ppm	12 3		Gray, medium-coarse sandy FILL, some silt, moderate hydrocarbon-like odor, loose, wet
				9 2		
				3		(gas holder foundation at 19')
20						Base of boring - 19 ft.
25						

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Site Id: SB-16

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/16/03 - 09/16/03

Total Depth: 49.00'

Elevation: 10.54'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-49'

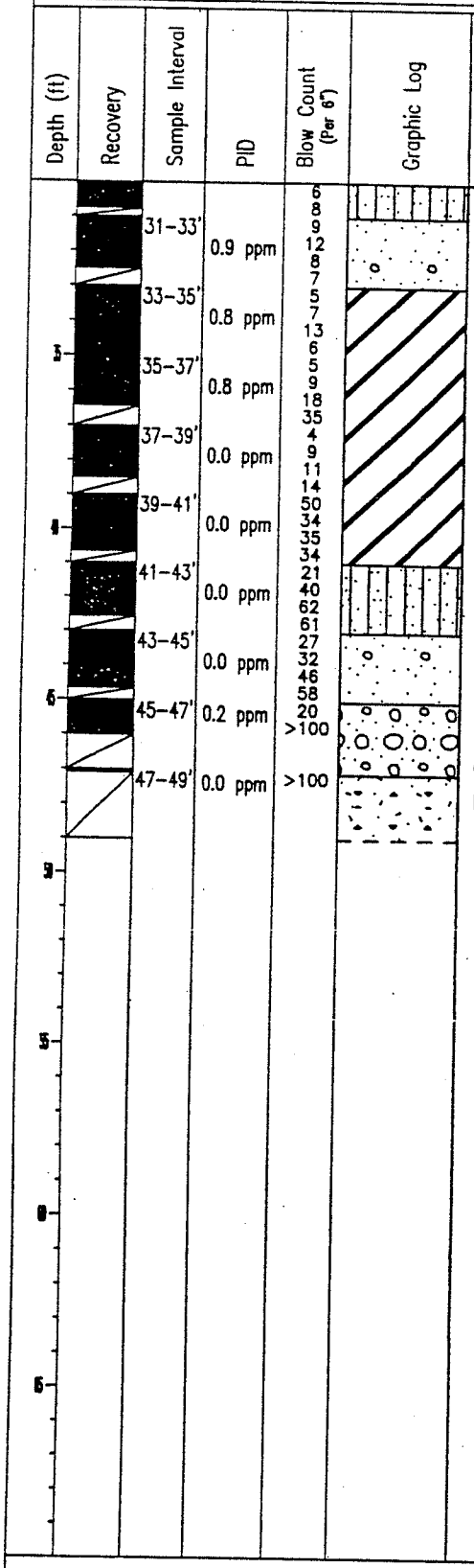
Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Samples selected for analysis at 19-21.4' and 25-27'.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.2' asphalt, to 0.5' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	1 1 1 2		Brown, silty fine SAND, trace gravel, trace seashells, loose, moist
		7-9'	0.4 ppm	70 >100		Brown, silty fine SAND, loose, moist
10		9-11'	2.0 ppm	1 2 2 4		Brown, fine SAND, some silt, some wood, slight naphthalene-like odor, wet
		11-13'	0.7 ppm	1 2 1 4		Brown-gray, fine SAND, some silt, loose, wet
		13-15'	104 ppm	8 9 6 6		Black, fine silty SAND, sheen, strong hydrocarbon-like odor, loose, wet
15		15-17'	7.7 ppm	3 5 7 4		Black-brown, silty fine SAND, sheen, strong hydrocarbon-like odor, loose, wet
		17-19'	5.4 ppm	1 2 4 3		Same as above, slight hydrocarbon-like odor
20		19-21'	5.0 ppm	3 2 3 4		Gray, medium SAND w/silt from 19-19.3', loose, wet, to gray, CLAY w/organic material, dense, wet
		21-23'	0.6 ppm	4 3 3 4		Gray, medium-coarse SAND, slight hydrocarbon-like odor, loose, wet
		23-25'	11.6 ppm	6 WH		Same as above
25		25-27'	0.0 ppm	1 1 2 1		Gray, CLAY, dense, wet
		27-29'	0.8 ppm	WH WH 22		Same as above
		29-31'	1.5 ppm	3 3		Gray, medium-coarse SAND, some silt, trace clay, loose, wet

Location: West 42nd Street	Site Id: SB-16
Purpose: Soil Boring	Total Depth: 49.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 6.25in



Material Description
Gray, fine–medium SAND, trace gravel, loose, wet
Gray, CLAY, trace silt, dense, wet
Same as above
Same as above, moist
Same as above, some weathered bedrock
Brown–gray, silty fine SAND, some gravel, dense, wet
Brown, fine–medium SAND, some gravel, dense, wet
Brown, GRAVEL, some f sand, some silt, weathered bedrock (mica schist) in tip of spoon, loose, wet
GRAVEL, mica schist fragments, loose, wet (bedrock at 47.1')
Base of boring – 47.1 ft.

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Site Id: SB-17

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/09/03 - 09/10/03

Total Depth: 33.00'

Elevation: 9.17'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-33'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 9-13' and 21-23'. Moved 2' west of its original proposed location to obtain soil classification data for the landscaped area.
WH:Weight of Hammer HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'				0.2' concrete FILL, topsoil, brick, concrete
5		5-7'				No recovery (boulder at 5')
		7-9'	0.0 ppm	80 34 16		Light brown, fine-medium sandy FILL, some brick and concrete, loose, dry
		9-11'	5.4 ppm	7 3 25 >100		Black, coarse sandy FILL, some gravel, metal in tip of split spoon, slight-mod. naphthalene-like odor, loose, wet
10		11-13'	3.1 ppm	13 11 9 6		Black, silty CLAY, slight-moderate naphthalene-like odor, dense, wet
		13-15'	3.3 ppm	1 30 10 10		Black, sandy CLAY, some wood, slight naphthalene-like odor, moderately plastic, wet
15		15-17'	2.3 ppm	4 16 15 13		Black-gray, silty CLAY, some wood, slight naphthalene-like odor, dense, wet
		17-19'	0.7 ppm	3 2 2 2		Same as above
		19-21'	0.5 ppm	2 1 2 3		Same as above from 19-19.8' w/trace shells, to gray, coarse SAND, wet
20		21-23'	0.4 ppm	1 1 1 1		Gray, CLAY, dense, wet
		23-25'	0.0 ppm	WH WH WH		Same as above
25		25-27'	0.0 ppm	3 WH WH 2		Same as above
		27-29'	0.0 ppm	2 WH		Same as above from 27-28.7', to gray, sandy CLAY, moderately plastic, wet
		29-31'	1.4 ppm	2 1 1		Gray, sandy CLAY, moderately plastic, wet

Location: West 42nd Street	Site Id: SB-17
Purpose: Soil Boring	Total Depth: 33.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		31-33'	10.4 ppm	1 1 WH 16		Gr, sandy CLAY, mod. plastic, wet, to mica schist fragments (bedrock at 33') Base of boring - 33 ft.

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Site Id: SB-18

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/26/03 - 09/26/03

Total Depth: 33.00'

Elevation: 8.30'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-33'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 9-13' and 23-25'. Unable to obtain PID readings from 5-9' due to heavy precipitation.
WH:Weight of Hammer
HSA:Hollow Stem Auger

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-5'		24 45 35 36		FILL, topsoil, brick, concrete
5		5-7'		4 8		Gray-brown, gravelly FILL, some silty fine sand, dry
		7-9'		10 16		Gray, coarse sandy FILL w/some gravel, crushed red brick in bottom 3", dry
		9-11'	51.0 ppm	4 5 7 9		Gray, coarse sandy FILL w/some red brick, to bk, fine sandy FILL, trace silt, sheen, strong naphthalene-like odor, loose, wet
10		11-13'	0.9 ppm	30 8 5 3		Gray, silty clayey FILL, trace f sand, to bk, coarse sandy FILL, trace gravel and silt, sheen, strong naphthalene-like odor, wet
		13-15'	1.6 ppm	3 5 8 35		Bk, coarse sandy FILL, trace gravel and silt, 6" of bk stained wood on bottom, sheen, strong naphthalene-like odor, wet
15		15-17'	0.0 ppm	>100		Black, fine sandy FILL, trace silt, 4" of bk stained wood on bottom, strong naphthalene-like odor, wet
		17-19'	2.0 ppm	3 2 2 3		Black, fine SAND, sheen, naphthalene-like odor, loose, wet
20		19-21'	3.0 ppm	2 2 2 2		Black-gray, fine SAND, some silt, trace wood, slight to moderate naphthalene-like odor, loose, wet
		21-23'	1.7 ppm	WH WH 2 1		Black-gray, silty CLAY, trace fine sand and shells, slight naphthalene-like odor, dense, wet
		23-25'	0.0 ppm	1 1 1		Gray, CLAY, trace organics and shells, dense, wet
25		25-27'	0.6 ppm	1 1 1 1 1		Black-gray, CLAY, trace silt, trace organics and shells, slight naphthalene-like odor, dense, wet
		27-29'	0.6 ppm	1 1		Bk-gray, CLAY, bottom 6" silty sand, trace silt and shells, organics, slight naphthalene-like odor, med-dense, wet
		29-31'	0.0 ppm	WH 1		Gray, silty SAND w/some clay, shells, sl naphthalene-like odor, wet

Location: West 42nd Street	Site Id: SB-18
Purpose: Soil Boring	Total Depth: 33.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		31-33'	0.0 ppm	1 1 >100		Gray, silty fine-med SAND, some clay, trace shells and organics, slight naphthalene-like odor, wet (bedrock at 31.4')
						Base of boring - 31.4 ft.
3						
4						
5						
6						
7						
8						
9						

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Site Id: SB-19

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 10/02/03 - 10/02/03

Total Depth: 26.20'

Remarks: Samples selected for analysis at 20-24' and 24-26.2'.

Elevation: 6.99'

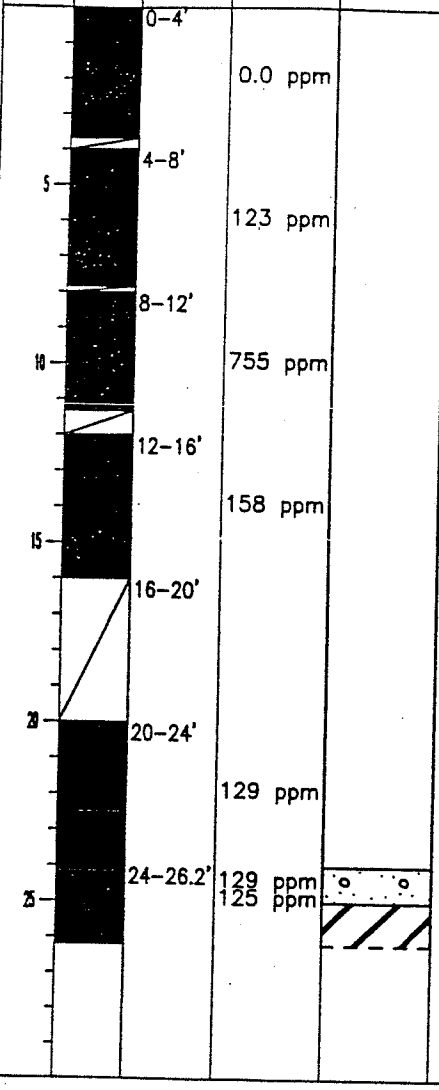
Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Geoprobe

Contractor: Jersey Boring

Borehole Dia.: 2.00in



PID	Material Description
0.0 ppm	Brown, FILL w/topsoil and stone dust from 0-0.7', dry, to light brown, fine-medium sandy FILL, trace gravel and brick, dense, dry
	Same as above
123 ppm	Brown-black, silty FILL w/fine sand, trace clay, moderate hydrocarbon-like odor, wet
755 ppm	Black, silty FILL w/fine sand, trace clay and coarse gravel, sheen, strong hydrocarbon and naphthalene-like odors, wet
158 ppm	Black, fine sandy FILL w/some silt, trace gravel, sheen, trace NAPL blebs, strong hydrocarbon and naphthalene-like odors, loose-dense, wet
	No recovery
129 ppm	Black, silty FILL, trace gravel and coal, sheen w/NAPL blebs, strong naphthalene-like odor, wet
129 ppm 125 ppm	Black-lt brown, fine-med SAND, slight-moderate naphthalene-like odor, dense, wet, to bk-gray, CLAY, trace silt and seashells, mod naphthalene-like odor, wet (bedrock at 26.2')
	Base of boring - 26.2 ft.

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Site Id: SB-20

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 10/02/03 - 10/02/03

Total Depth: 31.80'

Elevation: 7.88'

Datum: Mean Sea Level

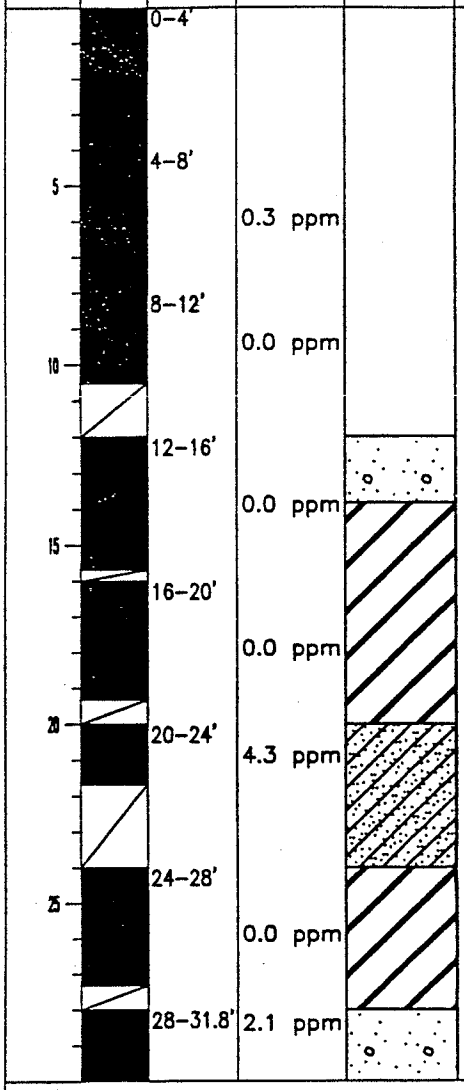
Logged By: C. Scharkopf

Drilling Method: HA from 0-5' GP from 4-31.8'

Contractor: Jersey Boring

Borehole Dia.: 2.00in

Remarks: Samples selected for analysis at 12-16' and 16-20'.
WH:Weight of Hammer
HA:Hand Auger
GP:Geoprobe



Material Description

1' concrete
FILL, topsoil, brick, concrete

Light brown, medium-fine sandy FILL, some bricks and concrete, trace mica schist fragments, dry

Same as above, trace black staining in tip of split spoon

Gray, coarse SAND from 12-13.8', some seashells, trace NAPL blebs, slight sheen, dense, wet, to gray, CLAY, some seashells, trace silt and organic material, wet

Gray-black, CLAY, trace seashells, trace organic material, dense, wet

Gray, fine sandy CLAY, trace seashells, trace organic material, loose, wet

Gray, silty CLAY, trace seashells, slight sheen, wet

Gray, coarse SAND, some gravel, some seashells, wet

Location: West 42nd Street	Site Id: SB-20
Purpose: Soil Boring	Total Depth: 31.80'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 2.00in

Depth (ft)	Recovery	Sample Interval	PID	Graphic Log	Material Description
					Gray, coarse SAND, some gravel, some seashells, wet (bedrock at 31.8')
					Base of boring - 31.8 ft.

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Site Id: SB-21

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/30/03 - 09/30/03

Total Depth: 38.80'

Elevation: 7.14'

Datum: Mean Sea Level

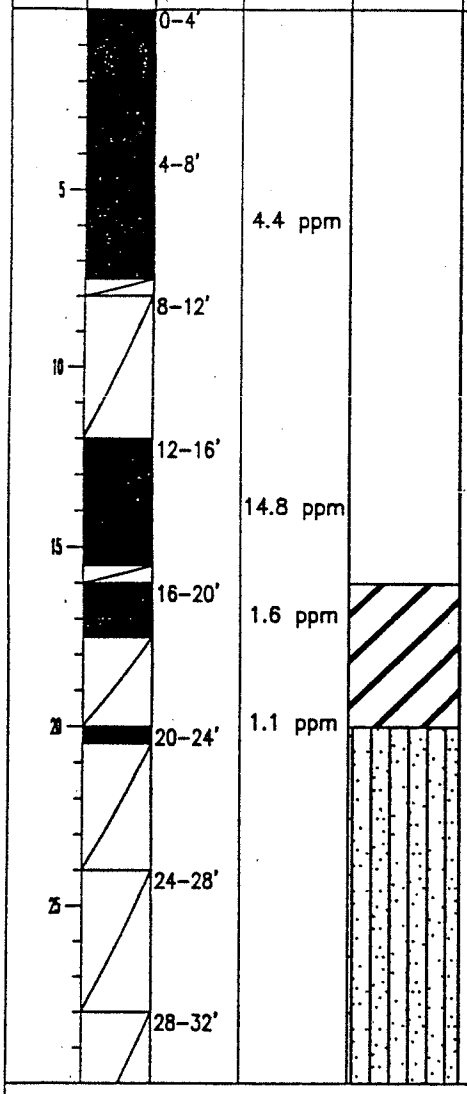
Logged By: C. Scharkopf

Drilling Method: HA from 0-5' GP from 4-38.8'

Contractor: Jersey Boring

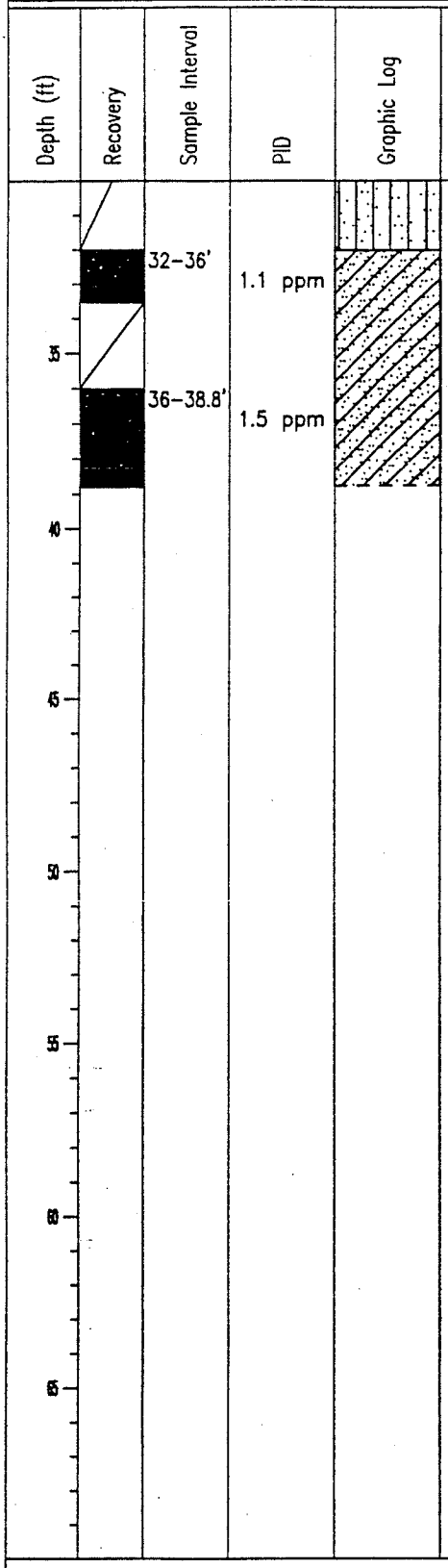
Borehole Dia.: 2.00in

Remarks: Samples selected for analysis at 12-16' and 36-38.8'.
WH:Weight of Hammer
HA:Hand Auger
GP:Geoprobe



Material Description
1' concrete FILL, topsoil, brick, concrete
Brown, FILL, some fine-coarse sand and topsoil, some brick fragments and concrete, some wood chips, very slight hydrocarbon-like odor, dense, moist
No recovery
Brown, silty FILL w/fine-coarse sand, some fine-coarse gravel, some wood chips, some organic material, slight sheen, slight hydrocarbon-like odor, dense, wet
Brown-dark brown, silty CLAY, some organic material, slight sheen from 16-16.3', medium dense, wet
Brown, silty fine-coarse SAND, some organic material, slight sheen, very slight hydrocarbon-like odor, medium dense, wet
No recovery
No recovery

Location: West 42nd Street	Site Id: SB-21
Purpose: Soil Boring	Total Depth: 38.80'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 2.00in



Material Description

Dark gray, silty CLAY w/some fine-coarse sand and gravel, some intermittant brown staining throughout, sheen, very slight hydrocarbon-like odor, dense, wet

Same as above, seashell fragments, mica schist in tip of split spoon (bedrock at 38.8')

Base of boring - 38.8 ft.

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Site Id: SB-22

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/29/03 - 09/29/03

Total Depth: 52.00'

Elevation: 4.67'

Datum: Mean Sea Level

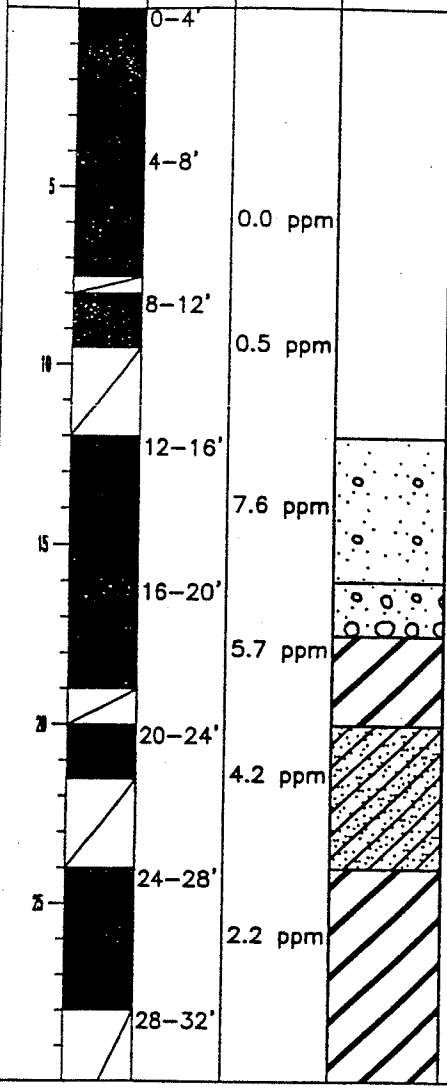
Logged By: A. Caniano

Drilling Method: Hand Auger from 0-4' GP from 4-52'

Contractor: Jersey Boring

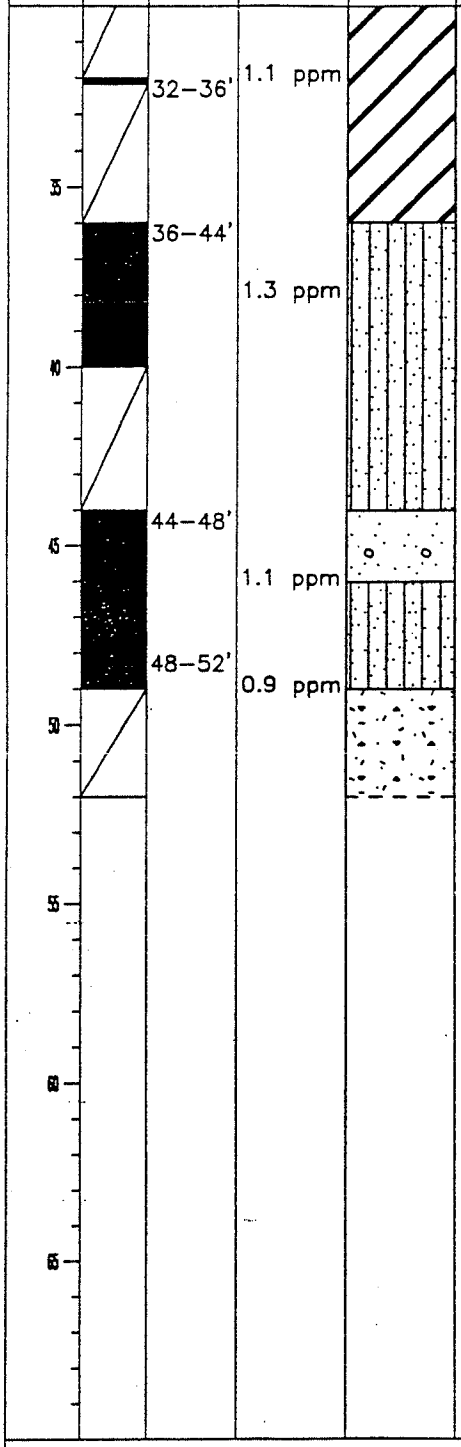
Borehole Dia.: 2.00in

Remarks: Samples selected for analysis at 12-16' and 36-44'. Moved from its original proposed location to within the loading dock area in River Place I.
WH:Weight of Hammer
GP:Geoprobe



Material Description
0.75' concrete FILL, topsoil, brick, concrete
Dark brown, medium-coarse sandy FILL, some gravel, chunks of concrete, red brick fragments and some coal at 4.5', wood fragments at 4.75', loose, moist
Dark brown, fine sandy FILL, some silt, red brick at 8.7', sheen, slight naphthalene-like odor, medium dense, wet
Brown, medium-coarse SAND w/some gravel, black staining from 12.5-16', sheen, strong naphthalene-like odor, loose, wet
Black, coarse SAND and GRAVEL, heavy staining, sheen - strong on gravel, strong naphthalene-like odor, loose, wet
Black, CLAY w/silt, staining, sheen, strong naphthalene-like odor, medium dense, wet
Black, CLAY, some sand, gravel and wood, heavy staining, sheen - strong on gravel, naphthalene-like odor, medium dense, wet
Black, CLAY, staining, strong naphthalene-like odor, medium dense, wet
Gray, CLAY, naphthalene-like odor, medium dense, wet No recovery

Location: West 42nd Street	Site Id: SB-22
Purpose: Soil Boring	Total Depth: 52.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 2.00in



Material Description

Gray/black, CLAY w/some silt, some shells, sheen on water, naphthalene-like odor, medium dense, wet

Gray, medium-fine SAND, some silt and gravel, little clay near bottom, sheen on gravel, naphthalene-like odor - stronger near top, medium dense, wet (driller overpushed to improve recovery)

Dark gray, coarse SAND w/gravel, sheen on gravel, naphthalene-like odor, loose, wet

Gray, fine sandy SILT, slight naphthalene-like odor, dense, wet

Gray, medium-coarse SAND, gravel, some silt, naphthalene-like odor, loose, wet (bedrock at 49')

Base of boring - 49 ft.

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Site Id: SB-23

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/30/03 - 09/30/03

Total Depth: 54.50'

Elevation: 3.04'

Datum: Mean Sea Level

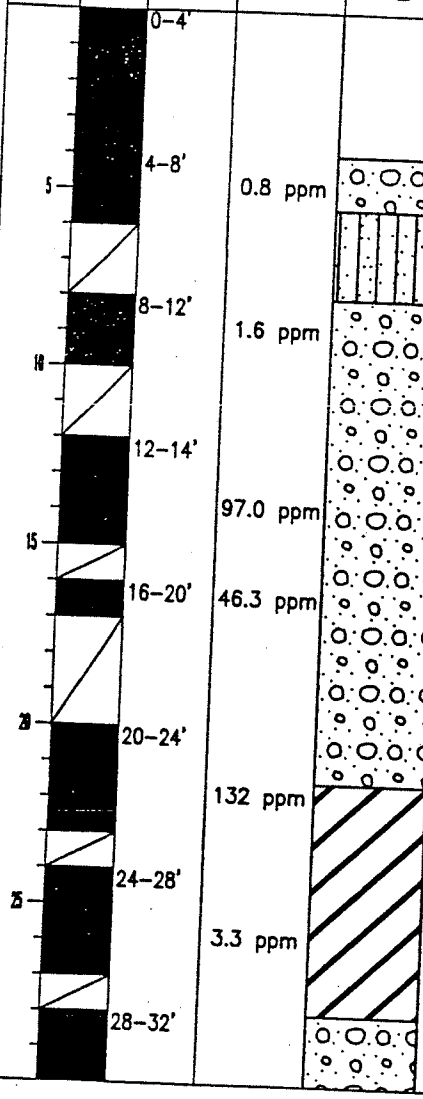
Logged By: C. Scharkopf

Drilling Method: HA from 0-5' GP from 4-54.5'

Contractor: Jersey Boring

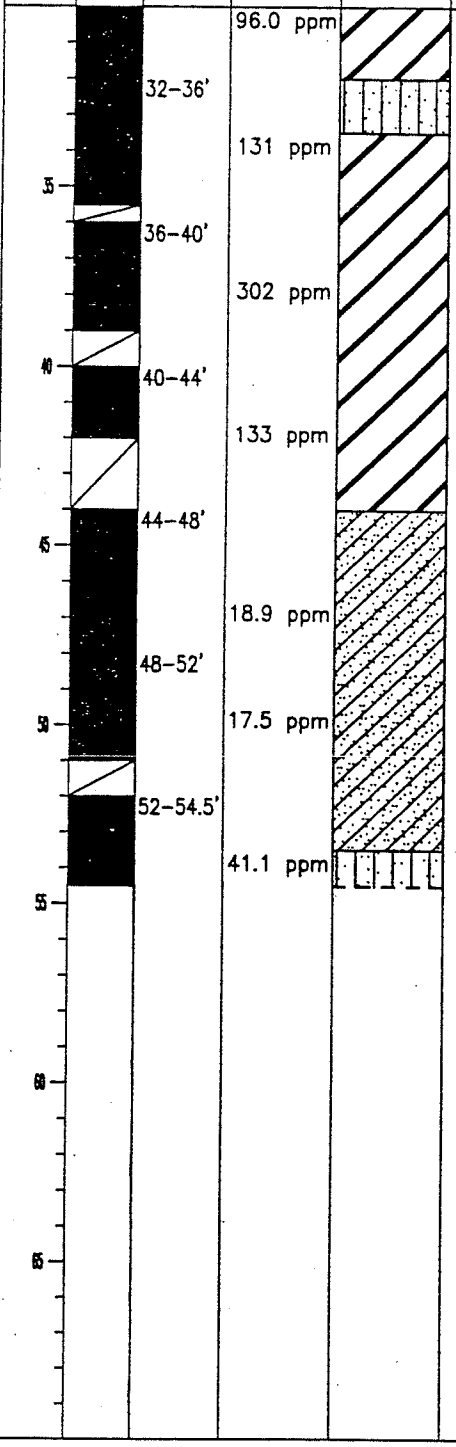
Borehole Dia.: 2.00in

Remarks: Samples selected for analysis at 20-24' and 52-54.4'.
HA:Hand Auger
GP:Geoprobe



Material Description
1' concrete FILL, topsoil, brick, concrete
Brown-dark brown-gray, fine-coarse SAND and GRAVEL, some silty sand and gravel from 5.5-6', loose, moist-wet
Dark brown, medium-coarse silty GRAVEL, some fine-coarse sand, very slight hydrocarbon-like odor, loose, wet
Brown, coarse GRAVEL, to black, coarse GRAVEL from 14.5-15', heavily stained/saturated w/tar, sheen, strong hydrocarbon-like odor, loose, wet
Brown-black, medium-coarse GRAVEL, some coarse sand, strong hydrocarbon-like odor, loose, wet
Black, coarse SAND and GRAVEL, little silt, heavily stained/saturated with tar, sheen, strong fuel oil-like odor, loose, wet, to black, CLAY from 21.5-23', some gravel, fuel oil-like odor, medium dense, wet
Black, CLAY, trace gravel, sheen, slight hydrocarbon-like odor, medium dense, wet
Black, med-coarse SAND and GRAVEL, little silt, sheen, hydrocarbon-like odor, wet

Location: West 42nd Street	Site Id: SB-23
Purpose: Soil Boring	Total Depth: 54.50'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 2.00in



Material Description

Black, CLAY, seashells, slight hydrocarbon-like odor, dense, wet

Black-dark gray, silty fine-coarse SAND, trace fine-medium gravel from 32-33'

Gray, CLAY, sheen, strong hydrocarbon-like odor, medium dense, wet

Dark gray-gray, silty CLAY, some wood, slight sheen, strong hydrocarbon-like odor, soft-medium dense, wet

Dark brown, silty CLAY w/fine-coarse gravel, little fine-coarse sand, sheen, strong hydrocarbon-like odor, soft, wet

Dark gray, CLAY w/some fine sand, trace fine-coarse gravel, some seashells, slight hydrocarbon-like odor from 44-44.3', strong organic (H2S-like) odor from 44.3-48', soft-medium dense, moist-wet

Dark gray, silty CLAY w/some fine-coarse sand, some seashells, slight hydrocarbon-like odor to organic (H2S-like) odor, soft, wet

Dk gr-br, silty CLAY w/f-c SAND from 52-53.5', silty f-c SAND from 53.5-54.5', trace mica schist, sheen and mod hydrocarbon-like odor from 52-53.5', loose-med dense, wet (bedrock at 54.5')

Base of boring - 54.5 ft.

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Site Id: SB-24

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/30/03 - 10/03/03

Total Depth: 38.00'

Elevation: 3.04'

Datum: Mean Sea Level

Logged By: C. Scharkopf

Drilling Method: HA 0-5' GP 4-8' HSA 8-11' MR 11-38'

Contractor: Jersey Boring

Borehole Dia.: 4.25in

Remarks: Samples selected for analysis at 30-32', 34-36' and 36-38'. Utilized Mud Rotery from 11-38' due to multiple refusals while drilling 0-11'.
HA:Hand Auger GP:Geoprobe
HSA:Hollow Stem Auger MR:Mud Rotary

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-4'				1' concrete FILL, topsoil, brick, concrete
5		4-8'	0.6 ppm			Brown, coarse sandy FILL w/gravel, coal layer from 4.7-5', gray-brown, silty clay from 5-5.5', white/gray rock fragments from 5.5-6', loose-medium dense, moist
						No recovery (boulder from 8-9')
10		9-11'	1.0 ppm	16 12 12 5		Dark brown, silty FILL, some wood shavings, trace cobble, very slight naphthalene-like odor, medium dense, wet
						No recovery (boulder from 11-12')
		12-14'	0.3 ppm	90 >50		Dark brown, silty FILL, some wood, some metal shavings from 12-12.2', medium dense, wet
15		14-16'	0.3 ppm	9 11 14		Dark brown-reddish brown, silty FILL, trace fine-coarse sand, some wood, some brick fragments, medium dense, wet
		16-18'	0.3 ppm	12 5 6		Same as above, trace clay and cobble
		18-20'	0.0 ppm	5 6 15 >100		Reddish brown, silty CLAY, trace cobble, cobble in tip of spoon, medium dense, wet
20		20-22'	0.0 ppm	5 6 16 18		Reddish brown-gray, silty GRAVEL, cobble, trace clay, trace fine-med sand, medium dense, wet
						No recovery (boulder from 22-24')
25		24-26'	0.0 ppm	2 2 5		Dark brown, SILT, trace cobble, trace wood, medium dense, wet
		26-28'	0.0 ppm	11 4 6 10 4		Brown, silty SAND, some coarse gravel, trace clay and cobble, medium dense, wet
						No recovery (boulder from 27-29')
		29-30'	6.0 ppm	>100		Dark brown, silty f-c GRAVEL, metal shavings, naph.-like odor, wet

Location: West 42nd Street	Site Id: SB-24
Purpose: Soil Boring	Total Depth: 38.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 4.25in

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
5		30-32'	68.6 ppm	27 75 >100		Hard material from 29.5-30', to bk, GRAVEL, some cobble, some wood, tar/NAPL saturated throughout, v strong naph.-like odor, wet
		32-34'	136 ppm	45 40 35 >100		Gray, CLAY, some wood, some metal shavings, tar/NAPL saturated-stained throughout, strong naph.-like odor, sheen, m dense, wet
		34-36'	27.5 ppm	4 5 5 5 1		Gray, CLAY, some wood, tar/NAPL stained-saturated from 34-34.3', sheen, strong napthalene-like odor, dense, wet
		36-38'	111 ppm			Black, CLAY, tar/NAPL, very strong naphthalene-like odor, sheen, wet
						Base of boring - 38 ft.

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Site Id: SB-25

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 10/01/03 - 10/01/03

Total Depth: 40.00'

Elevation: 6.18'

Datum: Mean Sea Level

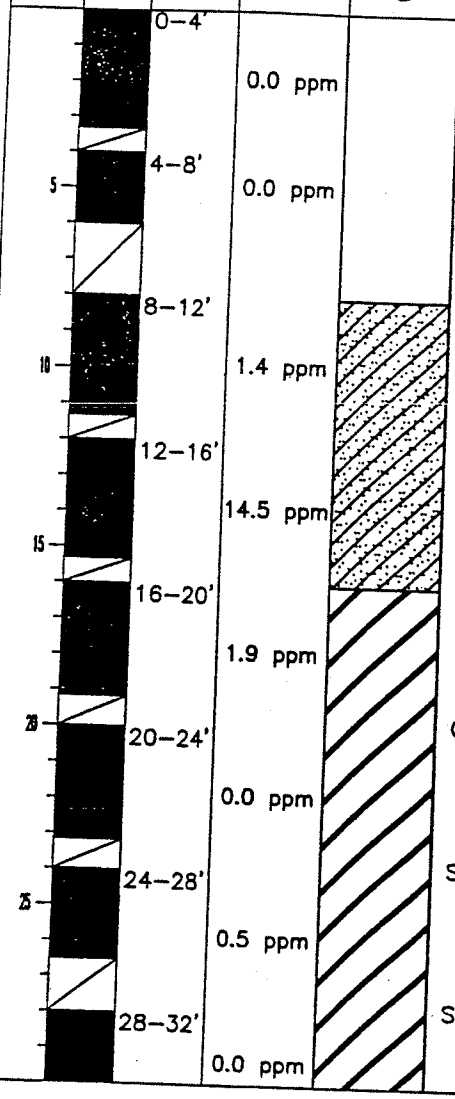
Logged By: K. Panella

Drilling Method: HA from 0-5' GP from 5-38'

Contractor: Jersey Boring

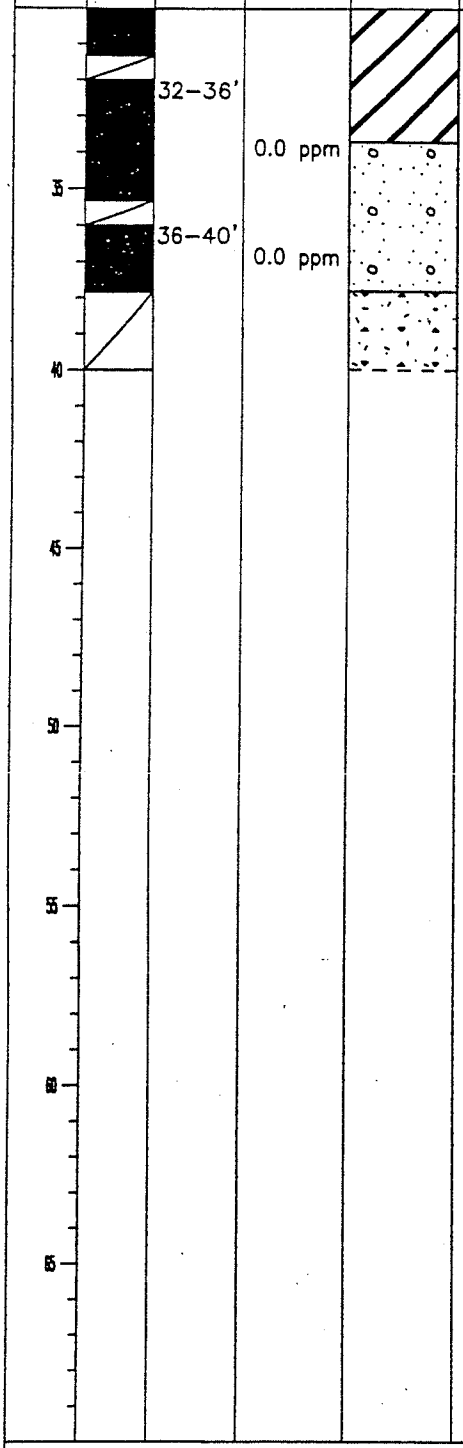
Borehole Dia.: 2.00in

Remarks: Samples selected for analysis at 12-16' and 24-28'.
WH:Weight of Hammer
HA:Hand Auger
GP:Geoprobe



Material Description
Black-brown TOPSOIL and coarse sandy FILL, trace crushed yellow brick, moist
Brown, medium-coarse sandy FILL, some silt, trace crushed yellow brick
Black, coarse SAND, some silty clay, loose, wet
Black, medium-coarse SAND, some silty clay, sheen, slight naphthalene-like and hydrocarbon-like odor
Black, silty CLAY, dense, wet
Gray, CLAY, trace silt, dense, wet
Same as above, trace shells
Same as above

Location: West 42nd Street	Site Id: SB-25
Purpose: Soil Boring	Total Depth: 40.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 2.00in



Material Description

Gray, CLAY, trace silt and shells, dense, wet

Same as above

Gray, fine-med SAND, trace mica schist at tip, loose, wet

Light brown, fine SAND, crushed mica schist at tip, dense, wet
(bedrock at 37.8')

Base of boring - 37.8 ft.

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Site Id: SB-26

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/29/03 - 10/06/03

Total Depth: 28.50'

Elevation: 7.09'

Datum: Mean Sea Level

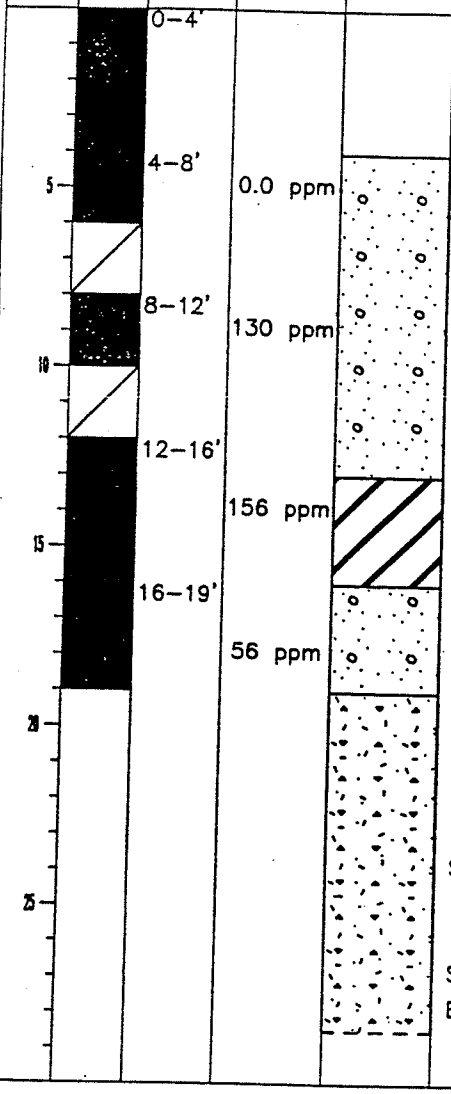
Logged By: K. Panella

Drilling Method: HA from 0-5' GP from 4-19' RC 19-29'

Contractor: Jersey Boring

Borehole Dia.: 2.00in

Remarks: Samples selected for analysis at 9-13', 16-19'. Moved 4' north of original proposed location.
HA:Hand Auger GP:Geoprobe
RC:NX Rock Core



Material Description

Black-brown TOPSOIL and coarse sandy FILL, trace crushed yellow brick, moist

Light brown, medium-coarse SAND, trace mica schist fragments, loose, moist

Same as above

Black, coarse SAND, some rock fragments, sheen, moderate-strong naphthalene and hydrocarbon-like odors, loose, wet

Same as above

Black, silty CLAY, strong naphthalene-like odor, dense, wet

Black, coarse SAND, sheen, strong naphthalene and hydrocarbon-like odors, loose, wet

Brown, fine-medium SAND, loose, wet
(bedrock at 19')

Quartz w/trace mica in rock core

Same as above

Same as above

Base of boring - 28.5 ft.

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Site Id: SB-27

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/22/03 - 09/23/03

Total Depth: 42.00'

Elevation: 9.53'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: HSA from 0-31' RC from 31-42'

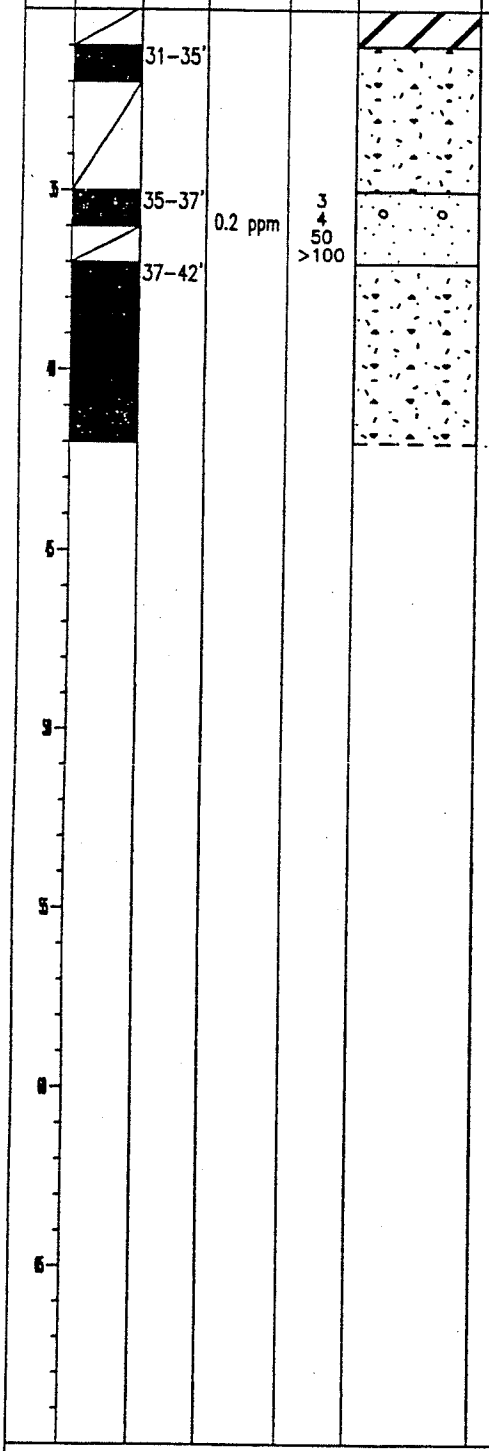
Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Samples selected for analysis at 18-20' and 29-31'. Completed within TP-09.
WH:Weight of Hammer
HSA:Hollow Stem Auger
RC:NX Rock Core

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-10'	0.0 ppm			0.7' concrete
			0.0 ppm			Brown-bk, med-coarse sandy FILL, some brick, concrete and boulders, loose, moist
5			0.0 ppm			Same as above, murky water rushed into excavation
			0.0 ppm			Same as above, wet from water within excavation
			0.0 ppm			Same as above
10		10-12'	0.0 ppm	10 7 5 5		Gray, medium-coarse sandy FILL, trace crushed mica schist, loose, wet
		12-14'	0.0 ppm	2 4 5 5		Gray-red, fine-medium sandy FILL, trace mica, loose, wet
		14-16'	0.0 ppm	5 11 10		Gray, coarse sandy FILL, trace gravel, loose, wet
15		16-18'	0.0 ppm	8 3 3 4		Gray, fine-medium sandy FILL, loose, wet
		18-20'	145 ppm	2 1 2 3 2		Gray-black, fine sandy FILL, strong naphthalene-like odor, loose, wet (hit refusal at 20' at holder bottom)
20						
		21-23'	203 ppm	1 3 5 >100		0.5' crushed concrete Black, fine SAND, staining, strong naphthalene-like odor, wet
		23-25'		WH WH WH 3		No recovery, no sheen or odor on split spoon
25		25-27'	4.0 ppm	WH WH 2 3		Gray, CLAY, trace silty fine sand, trace wood and organics, wet
		27-29'	5.2 ppm	WH		Same as above
		29-31'	85.0 ppm	1 >100		Same as above, some silt, sheen, slight-mod naphthalene-like odor

Location: West 42nd Street	Site Id: SB-27
Purpose: Soil Boring	Total Depth: 42.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 6.25in



Material Description

1' of black shale from 31-32'
Core barrel driven to 35' - no recovery from 32-35'

Dark brown, medium SAND, trace gravel, 0.1' band of black medium sand, wet (bedrock at 37', rock core collected)
Shale and pegmatite in rock core

Base of boring - 42 ft.

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Site Id: SB-28

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/25/03 - 09/25/03

Total Depth: 29.00'

Elevation: 7.77'

Datum: Mean Sea Level

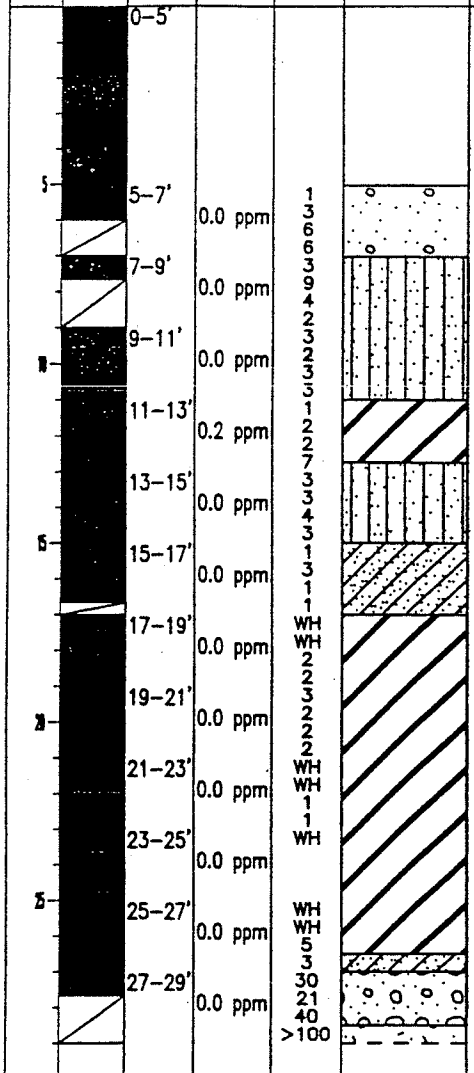
Logged By: K. Panella

Drilling Method: Hand Auger from 0-5' HSA from 5-29'

Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Sample selected for analysis at 11-13'.
WH:Weight of Hammer
HSA:Hollow Stem Auger



Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Material Description
		0-5'			FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	1 3 6	Light brown, medium SAND, trace silt and gravel, loose, moist
		7-9'	0.0 ppm	6 3 9	Black, silty SAND, trace medium sand, loose, moist
		9-11'	0.0 ppm	4 2 3	Same as above, shale stuck in tip of split spoon
10		11-13'	0.2 ppm	2 3 5 1 2 2	Gray, CLAY, trace shells, dense, to black, silty fine SAND in bottom 2", moist
		13-15'	0.0 ppm	7 3 4	Black, silty fine-medium SAND, loose, wet
15		15-17'	0.0 ppm	3 1 3 1 1	Same as above, some clay
		17-19'	0.0 ppm	WH WH 2	Black, CLAY w/some silt, chunk of wood at 18.5', loose-medium, wet
20		19-21'	0.0 ppm	2 3 2 2 2	Gray-black, CLAY, some silt, trace fine-medium sand, trace shells, dense, wet
		21-23'	0.0 ppm	WH WH 1	Gray, CLAY, trace silt, trace shells and organics, dense, wet
		23-25'	0.0 ppm	1 WH	Same as above
25		25-27'	0.0 ppm	WH WH 5	Same as above, some coarse sand and gravel from 26.5-27'
		27-29'	0.0 ppm	3 30 21 40 >100	Brown, coarse SAND and GRAVEL, black mica schist at tip, loose, wet (bedrock at 28.5')
					Base of boring - 28.5 ft.

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Site Id: SB-29

Location: West 42nd Street

Purpose: Soil Boring

Date(s): 09/24/03 - 09/25/03

Total Depth: 54.00'

Elevation: 10.28'

Datum: Mean Sea Level

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

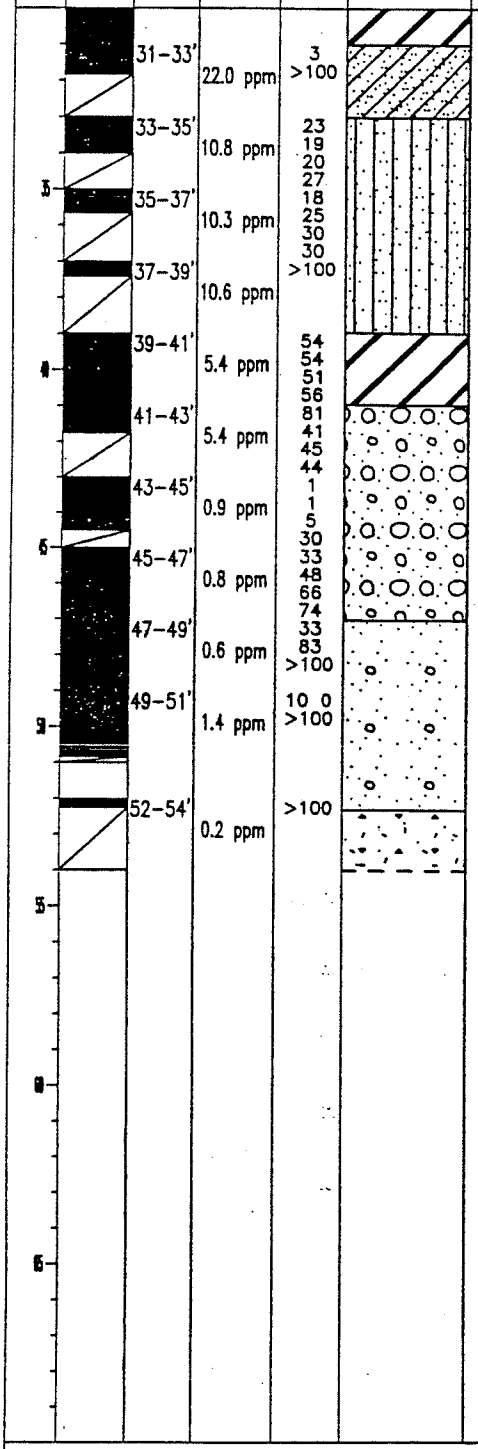
Contractor: Jersey Boring

Borehole Dia.: 6.25in

Remarks: Samples selected for analysis at 19-23' and 39-41'. Completed within TP-08.
WH:Weight of Hammer

Depth (ft)	Recovery	Sample Interval	PID	Blow Count (Per 6")	Graphic Log	Material Description
		0-10'	0.0 ppm			0.7' concrete
			0.0 ppm			Br, med-coarse sandy FILL, trace brick, boulders, concrete, loose, moist
						Same as above, pipe debris
5			82.9 ppm			Brown-gray, med-coarse sandy FILL, trace brick, boulders, concrete, staining, strong naphthalene-like odor, loose-dense, wet
			36.5 ppm			Brown-gray, silty fine-coarse sandy FILL, trace brick, boulders, concrete staining, strong naphthalene-like odor, loose-dense, wet
			85.5 ppm			Same as above
10		10-12'	99.0 ppm	19		Dk brown-black, medium-coarse sandy FILL, trace fine sand and crushed mica, loose, wet
			0.0 ppm	6 7 6		
		12-14'		2 9 >100		Same as above to mica schist boulder at 12.5', augered past boulder to 15'
			0.0 ppm			
15		15-17'	0.0 ppm	12 11 7		Lt gray, fine sandy FILL, some coarse sand and gravel, loose, wet
		17-19'	0.0 ppm	6 9 6 6		Gray, coarse-medium sandy FILL, trace crushed mica schist, wet
		19-21'	602 ppm	3 4 5 4		Same as above, to bottom 2" of black, fine sandy FILL, trace clay, strong naphthalene-like odor, wet
20		21-23'	801 ppm	4 4 3 4		Fine sandy FILL, trace clay, 2" crushed concrete and 1" wood at bottom, strong naphthalene-like odor, wet
		23-25'		21 10 3 1 1 2		No recovery, strong naphthalene-like odor and slight sheen on split spoon
25		25-27'	14 ppm	WH 1 1 1		No recovery, same as above on split spoon
		27-29'	4.8 ppm	WH		Gray, CLAY, trace silt and organics, slight naphthalene-like odor, slight sheen on split spoon, dense, wet
		29-31'	25.0 ppm	WH		Same as above, trace wood

Location: West 42nd Street	Site Id: SB-29
Purpose: Soil Boring	Total Depth: 54.00'
Consulting Firm: Dvirka & Bartilucci	Borehole Dia.: 6.25in



Material Description
Gray, silty fine sandy CLAY, some organic material, trace wood, slight naphthalene-like odor, loose, wet
Gray, silty medium-coarse SAND, slight naphthalene-like odor, loose, wet
Gray, coarse SAND, some silt, slight naphthalene-like odor, loose, wet
Same as above, crushed mica schist in tip of split spoon
Light gray, CLAY, trace silt and gravel, dense, moist
GRAVEL, some silty clay, loose, wet
Same as above
Gray-dark brown, GRAVEL, some fine sandy silt, dense, wet
Brown, fine SAND w/some gravel, dense, wet
Gray-dark brown, GRAVEL, some fine-medium sand, wet
Brown-gray, medium SAND and GRAVEL, mica schist in tip of split spoon, wet (bedrock at 52.3')
Base of boring - 52.3 ft.

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Site Id: MW-01

Date(s): 09/25/03 - 09/25/03

Datum: Mean Sea Level

Elevation: 7.77' | Measuring Point: 7.54'

Completed Depth: 19.00' | Total Depth: 29.00'

Location: West 42nd Street

Purpose: Monitoring Well, Shallow

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

Borehole Dia.: 6.25in

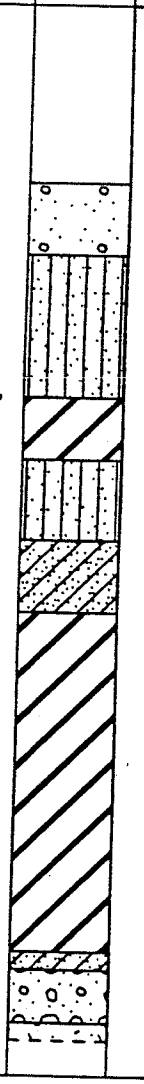
Contractor: Jersey Boring

Screens:
type: Slotted size: 0.020in dia: 2.00in fm: 7.00' to: 17.00'

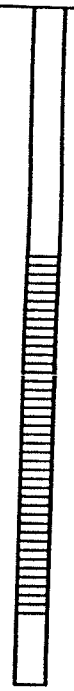
Remarks: Logged from boring SB-28.
MW-01 was moved to outside and downgradient of the northwest gas holder.

Depth (ft)	Recovery	Sample Interval	PID	Material Description
		0-5'		FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	Light brown, medium SAND, trace silt and gravel, loose, moist
		7-9'	0.0 ppm	Black, silty SAND, trace medium sand, loose, moist
10		9-11'	0.0 ppm	Same as above, shale stuck in tip of split spoon
		11-13'	0.2 ppm	Gray, CLAY, trace shells, dense, to black, silty fine SAND in bottom 2", moist
		13-15'	0.0 ppm	Black, silty fine-medium SAND, loose, wet
15		15-17'	0.0 ppm	Same as above, some clay
		17-19'	0.0 ppm	Black, CLAY w/some silt, chunk of wood at 18.5', loose-medium, wet
20		19-21'	0.0 ppm	Gray-black, CLAY, some silt, trace fine-medium sand, trace shells, dense, wet
		21-23'	0.0 ppm	Gray, CLAY, trace silt, trace shells and organics, dense, wet
		23-25'	0.0 ppm	Same as above
25		25-27'	0.0 ppm	Same as above, some coarse sand and gravel from 26.5-27'
		27-29'	0.0 ppm	Brown, coarse SAND and GRAVEL, black mica schist at tip, loose, wet (bedrock at 28.5')
				Base of boring - 28.5 ft.

Graphic Log



Screen Zones



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Site Id: MW-02

Date(s): 09/09/03 - 09/09/03

Datum: Mean Sea Level

Elevation: 8.47' | Measuring Point: 8.26'

Completed Depth: 19.00' | Total Depth: 33.00'

Location: West 42nd Street

Purpose: Monitoring Well, Shallow

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

Borehole Dia.: 6.25in

Contractor: Jersey Boring

Screens:
type: Slotted size: 0.020in dia: 2.00in fm: 7.00' to: 17.00'

Remarks: Logged from boring SB-06.

Depth (ft)	Recovery	Sample Interval	PID	Material Description
		0-5'		0.25' asphalt, to 0.75' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.1 ppm	Light brown, fine-medium sandy FILL, trace concrete, loose, dry
		7-9'		No recovery
10		9-11'	1.5 ppm	Black, silty SAND, dense, wet
		11-13'	1.8 ppm	Gray, CLAY, moderately plastic, moist
		13-15'	5.3 ppm	Gray-black, CLAY, dense, moist
15		15-17'	2.5 ppm	Black, silty SAND, trace mica, wet
		17-19'	4.8 ppm	Black, silty CLAY, trace mica schist fragments, slight naphthalene-like odor, wet
20		19-21'	3.5 ppm	Black, silty CLAY from 19-20.8', loose, wet, to gray, CLAY from 20.8-21', dense, wet
		21-23'	2.0 ppm	Gray, CLAY, dense, wet
		23-25'	0.5 ppm	Same as above
25		25-27'	0.2 ppm	Same as above, trace seashells
		27-29'	0.1 ppm	Same as above
		29-31'	0.2 ppm	Gray, silty CLAY, moderately plastic, wet

Graphic Log

Screen Zones

Consulting Firm: Dvirka & Bartilucci	Site Id: MW-02
Location: West 42nd Street	Date(s): 09/09/03 – 09/09/03
Purpose: Monitoring Well, Shallow	Total Depth: 33.00'

Depth (ft)	Recovery	Sample Interval	PID	Material Description	Graphic Log	Screen Zones
		31–33'	0.2 ppm	Gray, sandy CLAY, some mica schist, loose, wet (bedrock at 32.8')		
				Base of boring – 32.8 ft.		

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Site Id: MW-03

Date(s): 09/08/03 - 09/08/03

Datum: Mean Sea Level

Elevation: 9.55' | Measuring Point: 9.28'

Completed Depth: 19.00' | Total Depth: 35.00'

Location: West 42nd Street

Purpose: Monitoring Well, Shallow

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

Borehole Dia.: 6.25in

Contractor: Jersey Boring

Screens:
type: Slotted size: 0.020in dia: 2.00in fm: 7.00' to: 17.00'

Remarks: Logged from boring SB-09.

Depth (ft)	Recovery	Sample Interval	PID	Material Description
		0-5'		0.75' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	Brown, medium SAND, some mica fragments, loose, dry
		7-9'	8.3 ppm	Dark brown-black, medium SAND, some mica fragments, slight hydrocarbon-like odor, dense, moist
10		9-11'	1.3 ppm	Black, silty fine SAND, slight hydrocarbon-like odor, dense, moist
		11-13'	3.5 ppm	Gray, silty fine SAND, slight hydrocarbon-like odor, dense, moist
		13-15'	2.2 ppm	Black, silty fine SAND from 13-13.5', mica fragments from 13.5-14', slight hydrocarbon-like odor, dense, wet
15		15-17'	1.6 ppm	Black, silty fine SAND, slight hydrocarbon-like odor, dense, wet
		17-19'	1.5 ppm	Same as above
20		19-21'	2.5 ppm	Black-gray, CLAY, trace seashells, slight hydrocarbon-like odor, dense, wet
		21-23'	5.2 ppm	Black-gray, CLAY, dense, wet
		23-25'	2.5 ppm	Gray, CLAY, trace seashells, trace wood, dense, moist
25		25-27'	0.5 ppm	Same as above
		27-29'	0.6 ppm	Same as above, some seashells
		29-31'	4.7 ppm	Gray, silty CLAY, slight hydrocarbon-like odor, dense, wet

Graphic Log

Screen Zones

Consulting Firm: Dvirka & Bartilucci	Site Id: MW-03
Location: West 42nd Street	Date(s): 09/08/03 - 09/08/03
Purpose: Monitoring Well, Shallow	Total Depth: 35.00'

Depth (ft)	Recovery	Sample Interval	PID	Material Description	Graphic Log	Screen Zones
		31-33'	23.4 ppm	Gray, silty fine SAND, slight hydrocarbon-like odor, dense, wet		
		33-35'	0.5 ppm	Same as above (bedrock at 33.5') Base of boring - 33.5 ft.		

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Site Id: MW-04	
Date(s): 09/10/03 - 09/10/03	
Datum: Mean Sea Level	
Elevation:	Measuring Point: 9.15'
Completed Depth: 19.00'	Total Depth: 19.00'
Location: West 42nd Street	Screens: type: Slotted size: 0.020in dia: 2.00in fm: 7.00' to: 17.00'
Purpose: Monitoring Well, Shallow	
Logged By: K. Panella	
Drilling Method: Hand Auger from 0-5' HSA from 5-19'	
Borehole Dia.: 6.25in	Remarks: HSA:Hollow Stem Auger
Contractor: Jersey Boring	

Depth (ft)	Recovery	Sample Interval	PID	Material Description
		0-5'		FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	Black-gray, medium-coarse SAND, loose, moist
		7-9'	0.0 ppm	Same as above
		9-11'	1.1 ppm	Black, coarse SAND, some mica schist fragments, loose, wet
10		11-13'	0.5 ppm	Same as above
		13-15'	3.5 ppm	Black, coarse SAND w/silt, some mica fragments, loose, wet, to gray, coarse SAND, loose, wet
15		15-17'	3.1 ppm	Black-gray, silty CLAY, moderately plastic, wet
		17-19'	4.6 ppm	Gray, silty fine SAND, trace clay, moderately plastic, wet
20				Base of boring - 19 ft.
25				

Graphic Log

Screen Zones

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A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Site Id: MW-05

Date(s): 09/24/03 – 09/24/03

Datum: Mean Sea Level

Elevation: 10.38' | Measuring Point: 10.01'

Completed Depth: 19.00' | Total Depth: 42.00'

Location: West 42nd Street

Purpose: Monitoring Well, Shallow

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

Borehole Dia.: 6.25in

Contractor: Jersey Boring

Screens:
type: Slotted size: 0.020in dia: 2.00in fm: 7.00' to: 17.00'

Remarks: Logged from boring SB-10.

Depth (ft)	Recovery	Sample Interval	PID	Material Description
		0–10'	0.0 ppm	0.7' concrete Br, m–c sandy FILL, trace concrete, brick and pebbles, loose, moist
			3.0 ppm	Same as above, weak naphthalene–like odor, dense
				Same as above
5			4.0 ppm	
				Same as above
			8.0 ppm	
				Same as above
			11.0 ppm	
10		10–12'	0.5 ppm	Black, silty fine SAND, slight naphthalene–like odor, loose, moist
			12.0 ppm	
		12–14'	1.5 ppm	Brown–gray, silty CLAY from 12–12.8', moderately plastic, wet, to bk, SILT w/coarse sand, slight naphthalene–like odor, loose, wet
		14–16'		Black, fine–medium sandy CLAY from 14–15.7', loose, wet, to gray, silty CLAY, dense, moist
15			4.1 ppm	
		16–18'	0.2 ppm	Black, coarse SAND and GRAVEL (schist fragments) from 16–16.75', loose, wet, to gray, silty CLAY, dense, moist
		18–20'	0.2 ppm	Gray, CLAY, trace medium sand, trace organic material, dense, moist
20		20–22'	6.4 ppm	Gray, medium–coarse SAND, trace silt, trace organic material, loose, wet
		22–24'	6.2 ppm	Gray, medium–coarse SAND from 22–23.7', loose, wet, to gray, silty CLAY, trace organic material, dense, moist
		24–26'		Gray, CLAY, trace silt, trace organic material, dense, moist
25			1.2 ppm	
		26–28'	0.5 ppm	Gray, CLAY, some silt and fine sand, some organic material, wood, dense, moist
		28–30'	0.5 ppm	Gray, CLAY, trace silt and organic material, very dense, moist

Graphic Log

Screen Zones

Consulting Firm: Dvirka & Bartilucci	Site Id: MW-05
Location: West 42nd Street	Date(s): 09/24/03 - 09/24/03
Purpose: Monitoring Well, Shallow	Total Depth: 42.00'

Depth (ft)	Recovery	Sample Interval	PID	Material Description	Graphic Log	Screen Zones
		30-32'	0.2 ppm	Gray, CLAY, some fine sand, trace organic material, loose, wet		
		32-34'	0.4 ppm	Gray, medium-coarse sandy CLAY, moderately plastic, wet		
		34-36'	0.6 ppm	Gray, fine-medium SAND, some gravel, loose, wet		
35		36-37'		(bedrock at 35')		
		37-42'		(NX Rock Core from 35-42')		
				Granite		
40				Base of boring - 42 ft.		
45						
50						
55						
60						

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Site Id: MW-06

Date(s): 09/17/03 - 09/17/03

Datum: Mean Sea Level

Elevation: 10.54' | Measuring Point: 10.15'

Completed Depth: 19.00' | Total Depth: 49.00'

Location: West 42nd Street

Purpose: Monitoring Well, Shallow

Logged By: K. Panella

Drilling Method: Hollow Stem Auger

Borehole Dia.: 6.25in

Contractor: Jersey Boring

Screens:
type: Slotted size: 0.020in dia: 2.00in fm: 7.00' to: 17.00'

Remarks: Logged from boring SB-16.

Depth (ft)	Recovery	Sample Interval	PID	Material Description
		0-5'		0.2' asphalt, to 0.5' reinforced concrete FILL, topsoil, brick, concrete
5		5-7'	0.0 ppm	Brown, silty fine SAND, trace gravel, trace seashells, loose, moist
		7-9'	0.4 ppm	Brown, silty fine SAND, loose, moist
		9-11'	2.0 ppm	Brown, fine SAND, some silt, some wood, slight naphthalene-like odor, wet
10		11-13'	0.7 ppm	Brown-gray, fine SAND, some silt, loose, wet
		13-15'	104 ppm	Black, fine silty SAND, sheen, strong hydrocarbon-like odor, loose, wet
15		15-17'	7.7 ppm	Black-brown, silty fine SAND, sheen, strong hydrocarbon-like odor, loose, wet
		17-19'	5.4 ppm	Same as above, slight hydrocarbon-like odor
		19-21'	5.0 ppm	Gray, medium SAND w/silt from 19-19.3', loose, wet, to gray, CLAY w/organic material, dense, wet
20		21-23'	0.6 ppm	Gray, medium-coarse SAND, slight hydrocarbon-like odor, loose, wet
		23-25'	11.6 ppm	Same as above
25		25-27'	0.0 ppm	Gray, CLAY, dense, wet
		27-29'	0.8 ppm	Same as above
		29-31'	1.5 ppm	Gray, medium-coarse SAND, some silt, trace clay, loose, wet

Graphic Log

Screen Zones

Consulting Firm: Dvirka & Bartilucci	Site Id: MW-06
Location: West 42nd Street	Date(s): 09/17/03 – 09/17/03
Purpose: Monitoring Well, Shallow	Total Depth: 49.00'

Depth (ft)	Recovery	Sample Interval	PID	Material Description	Graphic Log	Screen Zones
		31–33'	0.9 ppm	Gray, fine–medium SAND, trace gravel, loose, wet		
		33–35'	0.8 ppm	Gray, CLAY, trace silt, dense, wet		
35		35–37'	0.8 ppm	Same as above		
		37–39'	0.0 ppm	Same as above, moist		
		39–41'	0.0 ppm	Same as above, some weathered bedrock		
		41–43'	0.0 ppm	Brown–gray, silty fine SAND, some gravel, dense, wet		
		43–45'	0.0 ppm	Brown, fine–medium SAND, some gravel, dense, wet		
45		45–47'	0.2 ppm	Brown, GRAVEL, some f sand, some silt, weathered bedrock (mica schist) in tip of spoon, loose, wet		
		47–49'	0.0 ppm	GRAVEL, mica schist fragments, loose, wet (bedrock at 47.1')		
				Base of boring – 47.1 ft.		

APPENDIX B

TEST PIT FIELD ACTIVITIES PHOTO DOCUMENTATION

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

08/12/03

P1

Breaking up asphalt and concrete at location TP-01, looking north.

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

08/13/03

Inside eastern wall of of Purifying House within TP-02, looking west .

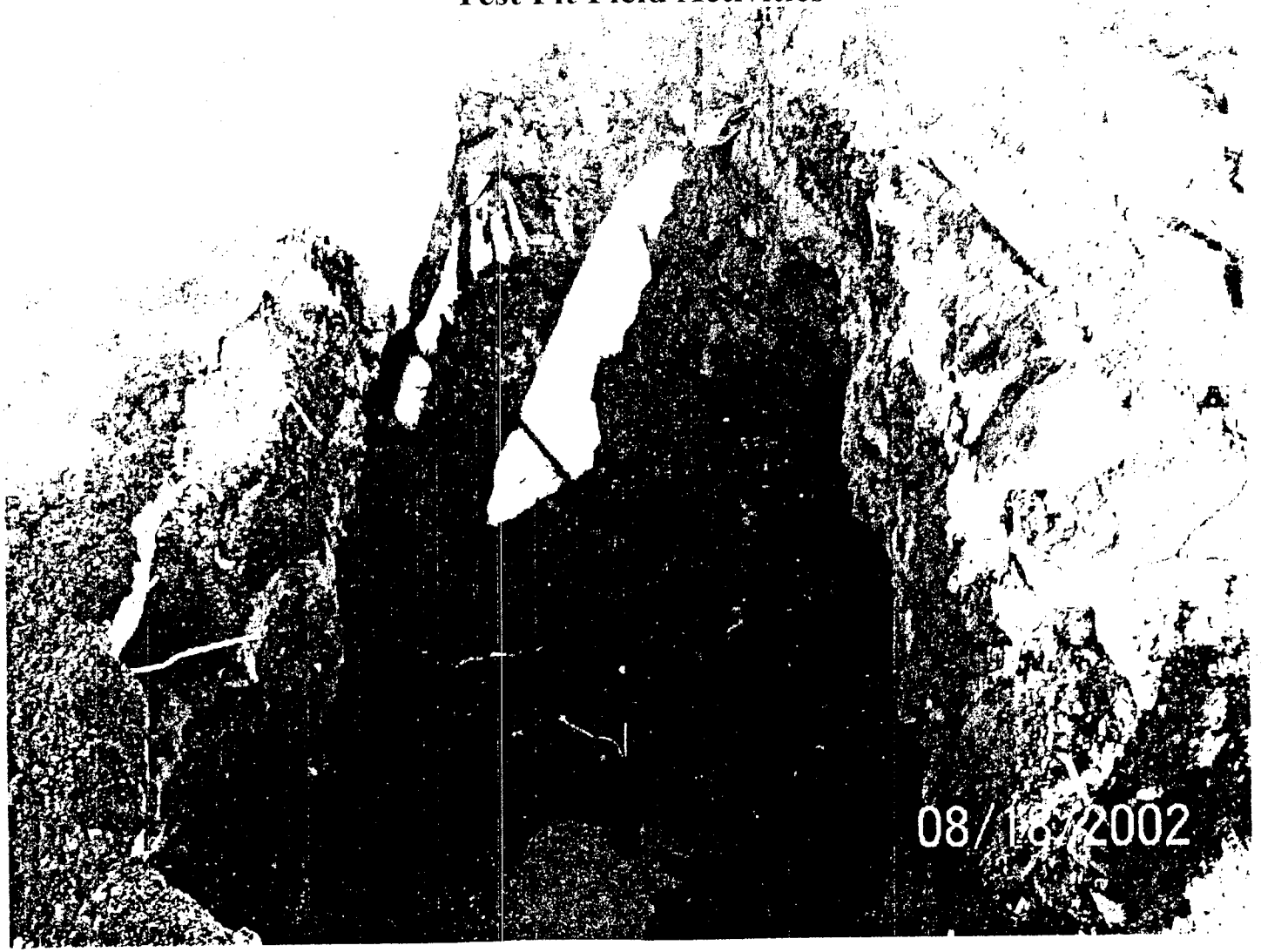
D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

08/19/03

P5

Concrete slab encountered in TP-03, looking north.

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities



Excavated TP-04 to 11 feet below grade, looking west.

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

08/20/03

Excavated TP-05 to 10 feet below grade, looking south.

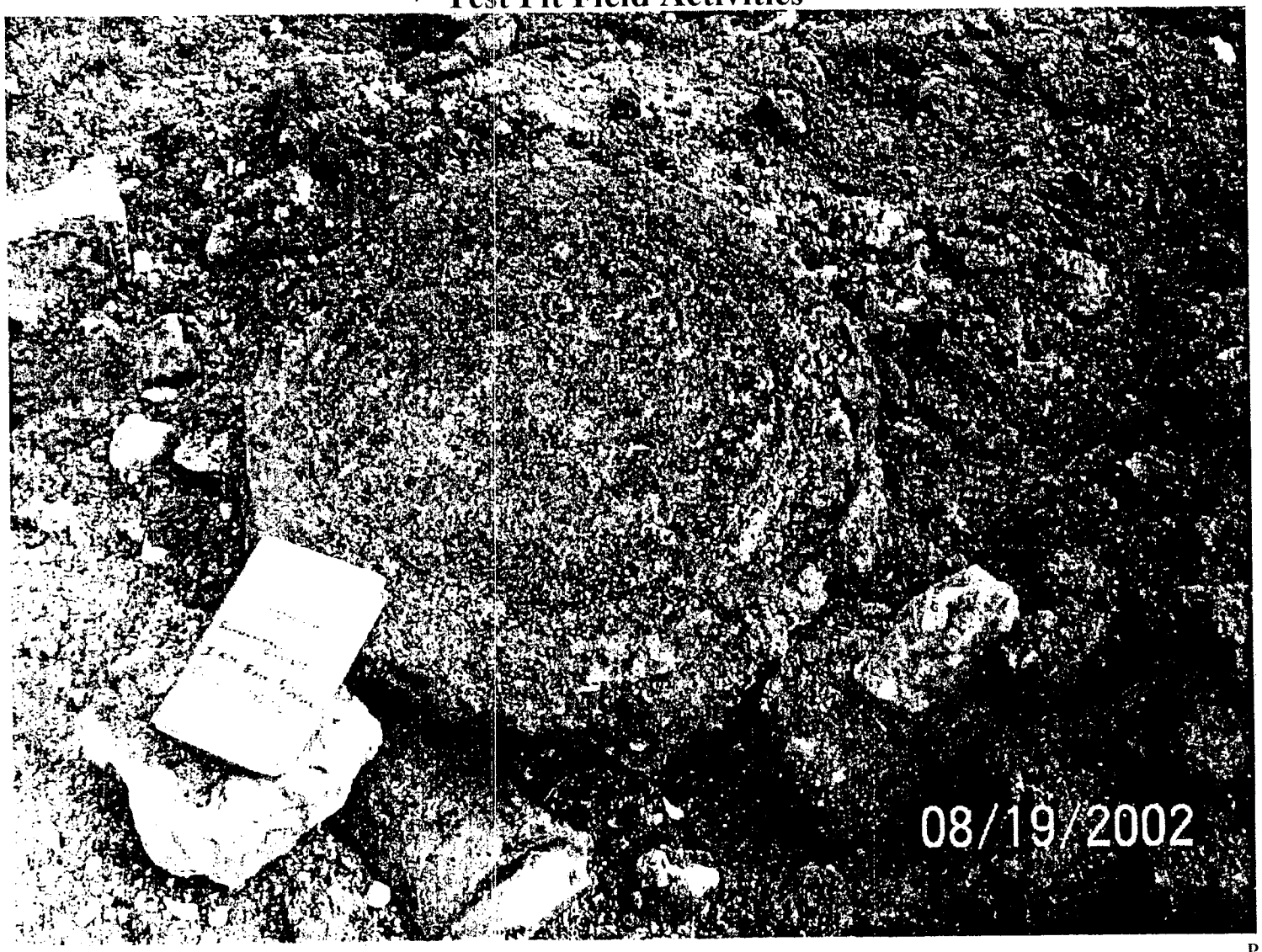
D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

08/22/03

P11

Excavated TP-06 to 11 feet below grade, looking north.

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

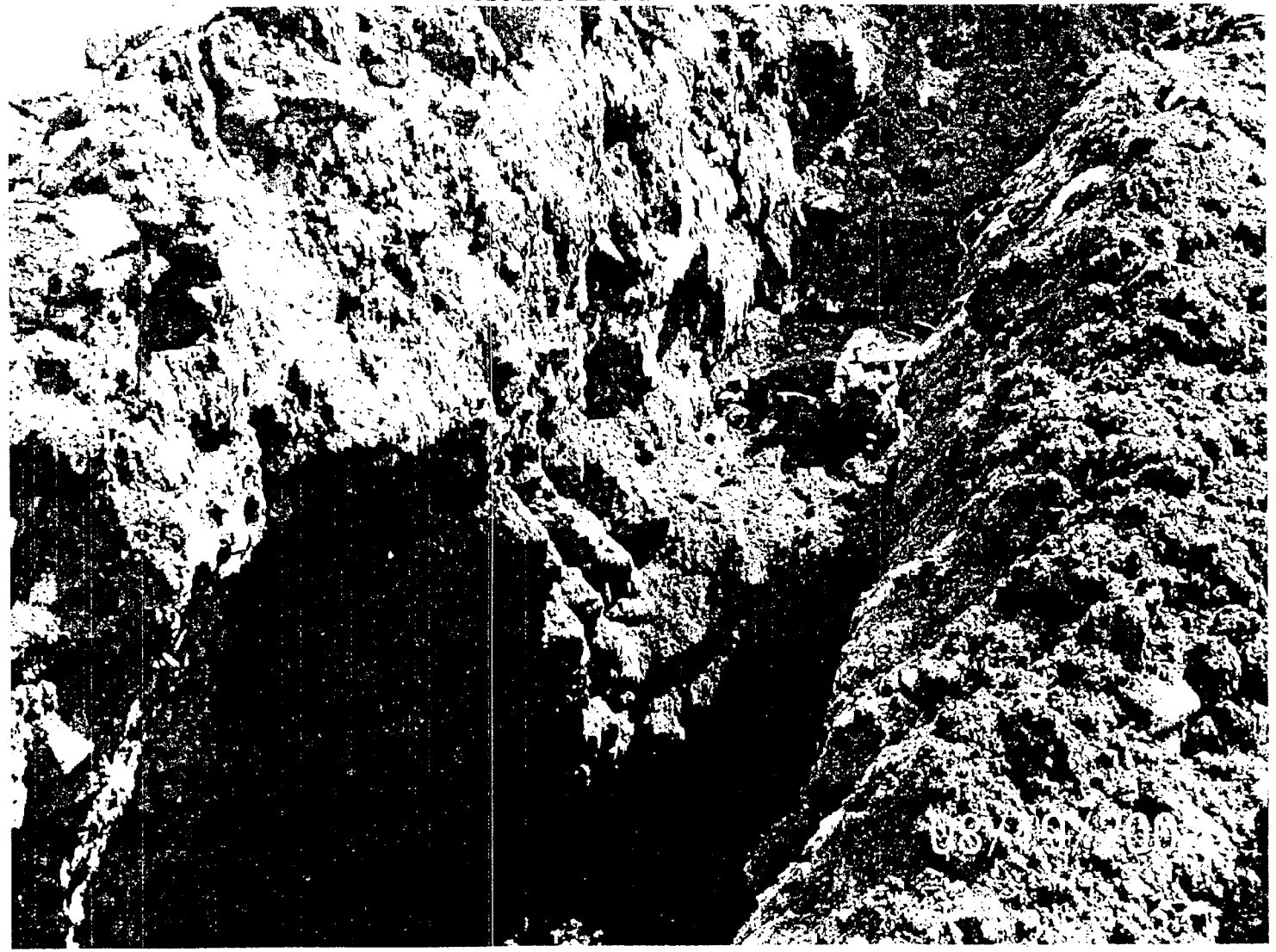


08/19/03

P13

Metal main gas line cover encountered in TP-07 at 10.5 feet below grade.

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities



Gas holder brick wall encountered in TP-07, looking southeast.

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

08/21/03

P17

Gas holder brick wall encountered in TP-08, looking north.

D&B - Site Photographs - Con Edison Site Characterization Study
West 42nd Street Former Manufactured Gas Plant Site
Test Pit Field Activities

08/19/03

P19

Excavated TP-09 to 10 feet below grade, looking south.