Final Remedial Investigation Report
Rockaway Park Former Manufactured Gas Plant Site
Rockaway Park, New York
Volume 1 of 2
Text, Tables, Figures, Plates

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Table of Contents

Executive Summary vii

1. Introduction 1

1.1 Final RI Objectives and Scope 2
1.2 Background 3
1.2.1 Description of the Former MGP Property 3
1.2.2 Delineation of Site Areas 4
1.2.3 History 5
1.2.4 Water Use 6
1.3 Physical and Environmental Setting 6
1.3.1 Regional Geology 7
1.3.2 Regional Hydrogeology 7
1.3.3 Climatology 7
1.4 Previous Investigations 8
1.4.1 Site Inspection Report, NUS Corporation, December 1989 8
1.4.2 Phase I Site Investigation Report, GEI, January 1997 8
1.4.3 Interim Remedial Measure Study, GEI, March 1999 9
1.4.4 Substation Investigation Report and Delisting Petition, D&B, August 2000 9
1.4.5 Underground Feeder Cable Investigation Report 10
1.4.6 New Substation Construction Support Activities, Foster Wheeler Environmental Corporation, November 2002 10
1.4.7 Remedial Investigation 10

2. Remedial Investigation Scope of Work 13

2.1 Final RI Field Work 13
2.2 Field Methods 14
2.2.1 Air Monitoring 14
2.2.1.1 Perimeter Air Monitoring 14
2.2.1.2 Worker Health and Safety Air Quality Monitoring 14
2.2.2 Soils (Borings and Surface) 15
2.2.2.1 Soil Borings 15
2.2.2.2 Soil Borings/Monitoring Well Installation 16
2.2.2.3 Surface-Soil Sampling 17
2.2.3 Groundwater 17
2.2.3.1 Purging 18
2.2.3.2 Sampling 18
2.2.4 Survey 19

2.2.5 Sediment 19
2.3 Air Monitoring and Health and Safety Findings 20
2.3.1 Meteorological Observations 20
2.3.2 Perimeter Air Monitoring Findings 21
2.3.3 Worker Health and Safety Air Monitoring Results 21

3. Site Geology and Hydrogeology 22
3.1 Geology 22
3.1.1 Fill 22
3.1.2 Barrier Island Deposits 22
3.1.3 Glacial Deposits 23
3.2 Site Hydrogeology 23
3.2.1 Tidal Study 25
3.2.2 Shallow Groundwater 26
3.2.3 Intermediate Groundwater 26
3.2.4 Deep Groundwater 27
3.2.5 Deep (2) Groundwater 27
3.2.6 Vertical Head Potentials and Gradients 27

4. Nature and Extent 29
4.1 Soil 31
4.1.1 Former Gas Works Area 32
4.1.2 Former Electric Substation Area 33
4.1.3 Former 2-Million Cubic-Foot Holder and Drip Tank Area 34
4.1.4 Current Electric Substation Area 36
4.1.5 Bulkhead Area 37
4.1.6 South and West Adjacent Areas 38
4.1.7 South and East Adjacent Areas 39
4.2 Surface-Soil Analytical Results 41
4.2.1 Former Gas Works Area 41
4.2.2 Former Electric Substation Area 42
4.2.3 Former 2-Million Cubic-Foot Holder & Drip Tank Area 42
4.2.4 Current Electric Substation Area 42
4.2.5 Bulkhead Area 42
4.3 NAPL 43
4.4 Groundwater Analytical Results 44
4.4.1 Shallow Groundwater 44
4.4.2 Intermediate Groundwater 44
4.4.3 Deep Groundwater 45
4.4.4 Deep (2) Groundwater 45
4.5 Jamaica Bay Sediment 46
4.6 Summary of Contaminant Distribution 48

5. Fate And Transport 50
5.1 DNAPL and LNAPL 50

5.2 Surface Soil 51
5.3 Subsurface Soil 52
5.4 Groundwater 54
5.5 Sediment 55

6. Qualitative Human Exposure Assessment 56
6.1 Introduction 56
6.1.1 Location and Description 57
6.1.2 Site History 57
6.1.3 Site Setting 58
6.1.4 Climate 58
6.1.5 Site Hydrogeological Characteristics 58
6.2 Qualitative Human Exposure Assessment 58
6.2.1 Nature and Extent of Chemical Constituents 58
6.2.2 Chemical Fate and Transport 58
6.2.3 Selection of Chemicals of Potential Concern 59
6.2.4 Exposure Setting and Identification of Potentially Exposed Populations 60
6.2.4.1 Current Scenarios 60
6.2.4.2 Future Scenarios 61
6.2.5 Identification of Exposure Pathways 62
6.2.6 Conclusions 63
6.3 Fish and Wildlife Resources Impact Analysis 64
6.3.1 Fish and Wildlife Resources 65
6.3.1.1 Terrestrial Resources 65
6.3.1.2 Aquatic Resources 66
6.3.1.3 Freshwater and Tidal Wetlands 67
6.3.1.4 Fish and Wildlife Resources 67
6.3.1.5 Observation of Stress 68
6.3.1.6 Value of Habitat to Associated Fauna 68
6.3.1.7 Value of Resources to Humans 69
6.3.2 Exposure Pathways Analysis 69
6.3.2.1 Chemicals of Potential Ecological Concern 69
6.3.2.2 Exposure Pathways 71
6.3.3 Criteria-Specific Toxicity Assessment 72
6.3.3.1 Soil 72
6.3.3.2 Sediment 74
6.3.4 Conclusions 76
6.3.4.1 Habitat Characterization 76
6.3.4.2 Soil 76
6.3.4.3 Sediment 77

7. Conceptual Site Model 78

8. Summary/Conclusions 80

References 83

Tables

1-1 Climatological Normals and Means – John F. Kennedy Airport
2-1 Sample Collection Rationale
2-2 Monitoring Well Construction Data
2-3 Groundwater Depths and Elevation
2-4 Final Groundwater Parameters
3-1 Hydraulic Conductivity Values
3-2 Vertical Hydraulic Head Differential and Gradients Within the Water Table Aquifer
4-1 Soil Analytical Results Former Gas Works Area (0-12 feet)
4-2 Soil Analytical Results Former Gas Works Area (12-24 feet)
4-3 Soil Analytical Results Former Gas Works Area (24-45 feet)
4-4 Soil Analytical Results Former Gas Works Area (45-90 feet)
4-5 Soil Analytical Results Former Gas Works Area (>90 feet)
4-6 Soil Analytical Results Former Electric Substation Area (0-12 feet)
4-7 Soil Analytical Results Former Electric Substation Area (12-24 feet)
4-8 Soil Analytical Results Former Electric Substation Area (24-45 feet)
4-9 Soil Analytical Results Former Electric Substation Area (45-90 feet)
4-10 Soil Analytical Results Former Electric Substation Area (>90 feet)
4-11 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
4-12 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (12-24 feet)
4-13 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (24-45 feet)
4-14 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (45-90 feet)
4-15 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (>90 feet)
4-16 Soil Analytical Results Current Electric Substation Area (0-12 feet)
4-17 Soil Analytical Results Current Electric Substation Area (12-24 feet)
4-18 Soil Analytical Results Current Electric Substation Area (24-45 feet)
4-19 Soil Analytical Results Current Electric Substation Area (45-90 feet)
4-20 Soil Analytical Results Bulkhead Area (0-12 feet)
4-21 Soil Analytical Results Bulkhead Area (12-24 feet)
4-22 Soil Analytical Results Bulkhead Area (24-45 feet)

4-23 Soil Analytical Results Bulkhead Area (45-90 feet)
4-24 Soil Analytical Results Bulkhead Area (>90 feet)
4-25 Soil Analytical Results South and West Adjacent Areas (0-12 feet)
4-26 Soil Analytical Results South and West Adjacent Areas (12-24 feet)
4-27 Soil Analytical Results South and West Adjacent Areas (24-45 feet)
4-28 Soil Analytical Results South and East Adjacent Areas (0-12 feet)
4-29 Soil Analytical Results South and East Adjacent Areas (12-24 feet)
4-30 Soil Analytical Results South and East Adjacent Areas (24-45 feet)
4-31 Soil Analytical Results South and East Adjacent Areas (45-90 feet)
4-32 Surface Soil Analytical Results Former Gas Works Area
4-33 Surface Soil Analytical Results Former Electric Substation Area
4-34 Surface Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area
4-35 Surface Soil Analytical Results Current Electric Substation Area
4-36 Surface Soil Analytical Results Bulkhead Area
4-37 Shallow Groundwater Analytical Results (0-17 feet)
4-38 Intermediate Groundwater Analytical Results (17-45 feet)
4-39 Deep Groundwater Analytical Results (45-90 feet)
4-40 Deep (2) Groundwater Analytical Results (>90 feet)
4-41 Jamaica Bay Sediments Analytical Results
4-42 Summary of Sediment PAH Concentrations
4-43 Analytical Data Statistical Summary
5-1 Soil Vapor and Ambient Air Analytical Results
6-1 Human Health Chemicals of Potential Concern
6-2 Exposure Matrix for the Rockaway Park Former Manufactured Gas Plant
6-3 Rockaway Park Former MGP Site Summary of Potential Exposures
6-4 Fish and Wildlife Resources Impact Analysis Decision Key
6-5 Plant Species Identified During Field Reconnaissance
6-6 Endangered and Threatened Species in the Vicinity of the Rockaway Park Site
6-7 Fish Species That May Be Present in Jamaica Bay
6-8 Herptile Species That May Be Present Based on Available Habitat
6-9 Bird Species That May Be Present Based on Cover Types
6-10 Mammals That May Be Present Based on Cover Types
6-11 Comparison of Rockaway Park Surface Soil Data to Toxicological Benchmark Values
6-12 Parameters for Calculation of Toxicological Benchmarks
6-13 Derivation of Toxicological Benchmarks for the Meadow Vole
6-14 Comparison of Sediment Results to ER-M and ER-L Values
6-15 Fish Species of Jamaica Bay Potentially Exposed to Site-Related PAHs

Figures

1. Site Location Map
2. Site Boundary Map
3. Site Topography and Surface Flow Paths
6-1A Conceptual Site Model – Current Site Plan
6-1B Conceptual Site Model – Historic Aerial Photograph
6-1C Conceptual Site Model – Environmental Attribute and Sensitive Receptors
6-1D Conceptual Site Model – Land Cover/Land Use Map

Plates

1. Site Plan, Sample Locations, and Historic Structures
2. Sediment Sample Location Map
3. Low Tide Shallow Groundwater Contour Map – September 16, 2002
4. High Tide (Shallow, Intermediate, Deep, Deep (2)) Groundwater Contour Maps – September 16, 2002
5. Low Tide Intermediate Groundwater Contour Map – September 16, 2002
6. Low Tide Deep Groundwater Contour Map – September 16, 2002
7. Low Tide Deep (2) Groundwater Contour Map – September 16, 2002
8. Lateral Extent and Analytical Soil Summary (0-12 Feet Below Grade)
9. Lateral Extent and Analytical Soil Summary (12-24 Feet Below Grade)
10. Lateral Extent and Analytical Soil Summary (24-45 Feet Below Grade)
11. Lateral Extent and Analytical Soil Summary (45-90 Feet Below Grade)
12. Lateral Extent and Analytical Soil Summary (>90 Feet Below Grade)
13. Cross-Sections A-A′, B-B′
14. Cross-Sections C-C’, D-D′
15. Cross-Section E-E′
16. Sediment Samples Total PAHs (mg/kg)

Appendices

A. Supplemental Remedial Investigation Work Plans and NYSDEC Approval Letters
B. Soil Boring Logs, Monitoring Well Construction Logs, and Test Pit Logs
C. Hydraulic Conductivity Calculations
D. Chain-of-Custody Forms and Data Validation Reports – Soils
E. Chain-of-Custody Forms and Data Validation Reports – Groundwater
F. Chain-of-Custody Forms and Data Validation Reports – Sediments

Executive Summary

On behalf of KeySpan Corporation (KeySpan), GEI Consultants, Inc. (GEI) conducted a Final Remedial Investigation (RI) and, in conjunction with Vanasse Hangen Brustlin, Inc. (VHB), prepared this Final RI report which addresses environmental conditions at and adjacent to the former manufactured gas plant (MGP) located along Beach Channel Drive between Rockaway Freeway and Beach 108th Street in Rockaway Park, Queens County, New York. The Final RI was performed in accordance with an Administrative Order on Consent (Index No. D2-0001-98-11) (AOC). The Final RI was also conducted in accordance with the New York Department of Environmental Conservation (NYSDEC)-approved RI work plan prepared by Dvirka & Bartilucci Consulting Engineers (D&B) in November 1999 and the NYSDEC-approved RI work plan addenda prepared by GEI, dated July 10 and September 20, 2002.

KeySpan previously completed a remedial investigation, which was published and presented at a Public Meeting led by NYSDEC in January 2003. The Final RI (this document) incorporates the findings from that and all previous investigations conducted at the site from 1996 to 2002.

Supplementary activities on-going at the site include:

- A supplemental sediment investigation
- A supplemental dissolved-phase groundwater investigation at the northeast corner of the site
- Implementation of an interim remedial measure (IRM) to address soils located between Beach Channel Drive and the bulkhead at Jamaica Bay

Findings from these on-going activities will be documented in supplemental reports. KeySpan is also preparing a feasibility study (FS) that will be submitted to NYSDEC for review and approval in early 2004.

The Final RI field activities were conducted between July 2002 and October 2002. The scope of work included the completion of soil borings, installation of groundwater monitoring wells, surface- and subsurface-soil sampling, hydraulic conductivity testing, groundwater sampling, and sediment sampling in an adjacent portion of Jamaica Bay.

The former MGP property is set in a commercial, industrial, and residential area and encompasses approximately 9.8 acres. The former MGP property currently includes active and inactive electric substations, an active natural gas regulator station, a infrequently-used three-story office building, an inactive one-story former workshop building, a large area

covered primarily with vegetation, grass, or soil, and a New York City-owned bulkhead area that is located north of Beach Channel Drive. The entire property except for the City-owned bulkhead area is enclosed by fencing and is secure from public access. The former MGP property is bounded by Beach Channel Drive, Beach 108th Street, and Rockaway Freeway. Jamaica Bay is located north of the Bulkhead.

The Rockaway MGP began operations in the late 1870s. In 1894, the plant consisted of two gas holders, a generator, purifiers and scrubbers. In 1912, the MGP expanded to the north and east and a portion of the southern property boundary was located beneath the present Rockaway Freeway. The plant further expanded in the mid-1920s to a strip of land to the north of the existing plant. This land was created when Jamaica Bay was hydraulically filled during the construction of Beach Channel Drive. The MGP ceased production and was demolished circa 1958.

Key findings of the RI are as follows:

- The lateral and vertical extent of soil and groundwater impacts associated with the former MGP have been defined by completion of the RI. A limited area of sediment impacts has also been identified and is being refined by the on-going supplemental sediment investigation.
- The geology beneath the site consists of sand with coarser shell-bearing layers. These materials extend over 150 feet deep. The nature of the sand and shell-bearing units has influenced the distribution of dense non-aqueous phase liquid (DNAPL) tar beneath the site. Tar saturated soils were encountered to a maximum depth of 105 feet beneath the former gas works at the center of the site. The tar-saturated soils occurred in discontinuous lenses and layers generally following the bedding of the coarser-grained shell layers.
- The lateral extent of the tar-saturated layers became limited with depth. In the north-central portion of the site, residual tar, including blebs and sheens, was observed near the skimming basin to depths of approximately 55 bgs. Additionally, blebs and sheens extending from the former electric substation area to the former skimming basin are present at depths of approximately 26 feet bgs.
- Tar impacted soils were only encountered off site in a limited area north of the central portion of the former MGP site and extended beneath Beach Channel Drive and the strip of land between Beach Channel Drive and the bulkhead at Jamaica Bay. These impacts were found to extend to a depth of approximately 65 feet below ground surface.
- Tar-saturated soils were not observed beneath Rockaway Freeway (south and west of the site) or Beach 108th Street (east of the site).

- The most extensive MGP tar-related soil and groundwater impacts were found in four on site areas:
  - Former tar separator and holders in the central portion of the former gas works area
  - Former skimming basin in the northern portion of the former gas works area
  - Former 2-million cubic-foot holder and former drip tanks in the eastern portion of the former gas works area
  - The historic hydraulic fill area located in the former electric substation area. The fill extends to a maximum depth of approximately 30 feet in the vicinity of the bulkhead
- Measurable DNAPL occurred in wells near the center of the site at the former gas works and near the former skimming basin in the north-central portion of the site, south of Beach Channel Drive. No measurable DNAPL was observed in other areas of the site.
- There is one shallow, tidally influenced, unconfined aquifer beneath the site. At low tide, groundwater discharges northerly toward Jamaica Bay, while at high tide groundwater flows southerly away from Jamaica Bay. This tidal fluctuation, along with former bulkhead/retaining walls (south of Beach Channel Drive and the hydraulically filled area) and the current bulkhead (north of Beach Channel Drive) have likely impeded the lateral migration of tar-related constituents towards Jamaica Bay.
- Dissolved groundwater concentrations of BTEX and total PAHs generally coincide with the presence of tar-saturated soils. On the east side of the site, dissolved BTEX and total PAH concentrations extend northeast beneath Beach 108th Street. The extent of this dissolved phase BTEX plume is being refined by the on-going groundwater investigation near the northeast corner of the site.
- Public water supply is currently provided to the property and all surrounding residents and businesses.
- A qualitative human exposure assessment based on current site conditions indicated that possible trespassers, KeySpan workers, and substation workers might be exposed to chemicals related to the MGP at adverse concentrations. Under future site use conditions, assuming no mitigative measures are put in place, additional potential receptors include: construction workers, commercial workers, adult and child visitors to the commercial establishment, and adult and child residents. Potential current and future off site receptors (assuming no mitigative measures) include adults and children recreating along the bulkhead adjacent to Jamaica Bay and nearby off site utility workers and possible construction workers.

- A fish and wildlife resources impact analysis indicated that the site and surrounding upland areas offer poor quality environmental resources habitat and the wildlife species (i.e., terrestrial and avian species) that are present are adapted to urban settings. Several chemicals of potential ecological concern (COPECs) were detected in soil at concentrations greater than applicable toxicological benchmarks; however, the potential risk of impacts due to these COPECs is considered minimal. The current and expected future uses of the site are of a type that will not support a significant wildlife population.

- The location of Jamaica Bay and the rich food resources found there make it a regionally important fish, wildlife and plant habitat complex. Impacts related to the site are not present in shallow sediments at adverse levels and the area of affected sediment is small in comparison to the available habitat in Jamaica Bay. In addition, because most Jamaica Bay fish species are migratory or have habitat preferences that would preclude their presence at the site for any length of time, the limited impacts are unlikely to have an effect on fish in Jamaica Bay.

The body of this RI report presents the environmental observations and findings. The reader is referred to Sections 6 and 7 for a summary of the environmental and risk findings and a summary of the conceptual site model, respectively.

1. Introduction

GEI Consultants, Inc. (GEI) was retained by KeySpan Corporation (KeySpan) to conduct a Final Remedial Investigation (Final RI) and to prepare this Final RI report which addresses environmental conditions related to the former manufactured gas plant (MGP) operation along Beach Channel Drive between Rockaway Freeway and Beach 108th Street in Rockaway Park, Queens County, New York (Figure 1). Qualitative Human Exposure Assessment and Fish and Wildlife Resources Impacts Analysis (FWRIA) aspects of the Final RI were conducted and the corresponding sections prepared by Vanasse Hangen Brustlin, Inc. (VHB).

The Final RI was performed in accordance with the Administrative Order on Consent (AOC) (Index No. D2-0001-98-11) between the Brooklyn Union Gas Company (KeySpan's predecessor) and the New York State Department of Environmental Conservation (NYSDEC). The Final RI was also conducted in accordance with the NYSDEC-approved RI work plan prepared by Dvirka & Bartilucci Consulting Engineers (D&B) in November 1999 and the NYSDEC-approved RI work plan addenda prepared by GEI on July 10 and September 20, 2002.

Supplementary on-going activities at the site include:

- A supplemental sediment investigation
- A supplemental dissolved phase groundwater investigation at the northeast corner of the site
- Implementation of an interim remedial measure (IRM) to address soils located between Beach Channel Drive and the bulkhead at Jamaica Bay

Findings from these on-going activities will be documented in supplemental reports.

This final RI Report presents a summary of previous investigations conducted at the site between 1989 and 2002. For a detailed discussion of the previous investigations, the reader is referred to those prior documents referenced herein. This report details the investigation methods employed during the final RI investigation activities conducted between July and October 2002. The presentation and discussion of the hydrogeology, nature and extent, fate and transport, conceptual model, and conclusions in this report are based upon all available investigation data obtained throughout the investigation history for the site. In addition, the qualitative human exposure assessment and the FWRIA are based upon all available data from the entire investigation history of the site. The data and interpretations presented on

drawings, figures, and tables include data obtained from all investigation activities conducted between 1996 and 2002.

KeySpan currently owns the former MGP property listed as 309-311 Beach Channel Drive. The City of New York owns the 0.6-acre parcel north of Beach Channel Drive (the Bulkhead Area), which is part of the site addressed by this Final Remedial Investigation Report. Figure 2 presents the current layout and former MGP configuration. The former MGP property and portions of the surrounding areas as depicted on Figure 2 are herein referred to as "the site." The scope of the Supplemental RI included subsurface borings, groundwater monitoring wells, and sediment and surface-soil collection points.

The remainder of Section 1 discusses the Final RI Objectives and Scope (subsection 1.1), background (subsection 1.2), the physical and environmental setting (subsection 1.3), and a summary of previous investigations (subsection 1.4). Subsection 1.2.1 presents a detailed description of the former MGP property.

Section 2 discusses the Final RI Scope of Work and methods used during the Final RI field investigation. Section 3 discusses the geology and hydrogeology underlying the former MGP. Section 4 discusses the nature and extent of all the field observations and chemical data collected at the former MGP. Section 5 discusses the fate and transport of chemical constituents. Section 6 discusses the Qualitative Human Exposure Assessment and the FWRIA. Section 7 presents a conceptual site model for the former MGP. The findings of the Final RI are summarized in Section 8.

1.1 Final RI Objectives and Scope

The Final RI was conducted in accordance with the AOC and in the NYSDEC-approved RI Work Plan and Addenda. The work plan addenda are included in Appendix A.

The objectives of the Final RI include:

- Further delineate the presence of benzene, toluene, ethylbenzene and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) in subsurface soil and groundwater
- Further evaluate the horizontal and vertical extent of potential nonaqueous phase liquid (NAPL)
- Provide additional data as to the potential mobility and recoverability of identified NAPL
- Further evaluate the potential off site migration of BTEX and PAH to the east and west of the site

- Evaluate the chemical quality of shallow sediments in Jamaica Bay adjacent to the site
- Evaluate the sediment quality data in terms of the potential effects on the ecological setting
- Conduct a Qualitative Human Exposure Assessment and FWRIA at the site
- Obtain additional data to evaluate the potential applicability/effectiveness of various remedial technologies under a Feasibility Study (FS)

The information gathered during the Final RI was intended to supplement information available from the RI Report prepared by D&B in October 2002 for the Rockaway Park former MGP property. Several other investigations were completed at the former MGP property in 1989 and between 1997 and 2000. These previous investigations are discussed in subsection 1.4.

1.2 Background

This subsection provides a description of the setting of the former MGP and discusses the history of the former MGP. Refer to D&B's October 2002 RI Report for detailed information regarding the setting and history at the property and the surrounding area.

1.2.1 Description of the Former MGP Property

The MGP formerly occupied approximately 9.8 acres as depicted on Figure 2. Currently the site includes the following:

- A former Long Island Power Authority (LIPA) electric substation was located in the northeastern portion of the property. The substation has been demolished except for the foundations.
- An active KeySpan natural gas regulator station located in the southeastern portion of the property
- An active LIPA electric substation located in the northwestern portion of the property
- A former three-story office building and a one-story former workshop building located in the north-central portion of the property

A paved driveway extends from the gate on Beach 108th Street to the office building area. Equipment storage areas are located between the workshop and the former electric substation

and are covered with gravel. The active substation and former substation are also covered with gravel. Both substations are surrounded by fencing and are locked. The remaining portion of the property is primarily covered with vegetation, grass, or soil. The entire property is enclosed by fencing and is secure from public access.

Surrounding properties include:

- North: Beach Channel Drive. North of Beach Channel Drive is a New York City-owned 0.6-acre strip of land (Bulkhead Area, considered part of the former MGP site), and then Jamaica Bay
- East: Beach 108th Street. East of Beach 108th Street is a New York City sewage treatment plant
- South: Rockaway Freeway. South of Rockaway Freeway are Metropolitan Transportation Authority (MTA) train tracks and an MTA yard. South of the tracks and yard are private residences.
- West: Rockaway Freeway. West of Rockaway Freeway are several auto service and retail businesses.

Refer to the RI Report for more information regarding population data in the vicinity of the site.

1.2.2 Delineation of Site Areas

Potential Contaminants of Concern associated with the former MGP have been detected at the subject property areas and on portions of Bulkhead Area, Rockaway Freeway, Beach Channel Drive, and Beach 108th Street.

The field investigations conducted encompass the areas shown on Figure 2. This Final RI Report has been organized into seven geographic site areas depicted on Figure 2. The geographic site areas are:

- Former Gas Works
- Former Electric Substation
- Former 2-Million cubic-foot Holder & Drip Tank

- Current Electric Substation. The Current Electric Substation has been excluded from the Registry of Inactive Hazardous Waste Disposal Sites by the NYSDEC based on previously collected data at the former MGP property.

- Bulkhead. This is an area located north of the current KeySpan property across Beach Channel Drive.

- South and West Adjacent Areas. These are areas adjacent to the current KeySpan property on a portion of Rockaway Freeway.

- South and East Adjacent Areas. These are areas adjacent to the current KeySpan property on a portion of Rockaway Freeway and Beach 108th Street. These areas also include the MW16I/S monitoring well cluster, located south of the MTA tracks.

- Jamaica Bay. This area includes a portion of Jamaica Bay adjacent to the bulkhead.

1.2.3 History

A summary of the Rockaway MGP history based on D&B's October 2002 RI Report is presented below. A more detailed discussion of the MGP history is presented in D&B's RI Report. Plate 1 shows the historic layout of the former plant. Sanborn Fire Insurance (Sanborn) Maps showing the MGP development growth over time have been submitted with previous reports.

The Rockaway MGP began operations in the late 1870s. The plant was operated by Rockaway Electric Light Co., Town of Hempstead Gas & Electric Company, and later the Queensboro Gas and Electric Company from the late 1870s to 1926. In 1926, Queensboro Gas and Electric Company became a subsidiary of the Long Island Lighting Company (LILCO). LILCO operated the plant from 1926 to approximately 1958, when most of the facilities were demolished. In 1998, KeySpan Corporation acquired the former MGP property through a merger of LILCO and Brooklyn Union Gas Company.

In 1894, the plant consisted of two gas holders, a generator, purifiers and scrubbers. The records indicate that the MGP operated carbureted water gas and coal carbonization processes during early gas production. After 1905, the carbureted water gas process was the only process used during gas production. In 1912, the MGP expanded to the north and east and a portion of the southern property boundary was located beneath the present Rockaway Freeway. The plant now included a half-million cubic foot gas holder, several oxide tanks, generator and boiler buildings, engine room, several oil tanks, and a condenser.

The plant expanded in the mid-1920s to a strip of land to the north of the existing plant. This land was created when Jamaica Bay was filled in during Beach Channel Drive Construction. In 1933, the plant figuration included several additional structures that could allow increased gasification, tar and oil separation and storage, and coke and gas storage. These structures included a 2-million cubic foot gas holder, drip oil tanks, skimming basin, condensers, oxide enclosure, generator ash storage bin, tar separator, tar settling and drying tanks, and tar de-emulsifier. The MGP ceased operations in 1957 and was demolished in 1958.

Five industrial supply wells were formerly located on the MGP property. A mixture of clay, liquid mud, and cement were used to abandon these wells. Three of the wells were abandoned in the 1930s and the abandonment dates of the other two wells are not known.

Several pipes were identified by D&B on plant construction drawings that appeared to connect to Jamaica Bay. The pipes were identified as salt-water drain lines, an oil line, and a sump drain line. These pipes have been subsequently removed.

1.2.4 Water Use

According to the D&B RI Report, the public water supply is currently provided to the former MGP property and surrounding area by the New York City Water Department. The water supply comes from a series of aqueducts from a watershed located 125 miles north of New York City.

There are no public or private water supply wells registered with the NYSDEC within a 2-mile radius of the property, according to the D&B report. In addition, according to the D&B report, the NYSDEC and the New York City Department of Health indicated that their records did not include any private water supply wells located in the vicinity of the site area.

1.3 Physical and Environmental Setting

The site area is generally flat with slight depressions near the central and southwestern portions of the current KeySpan property (Figure 3). Topographic elevations range from approximately 6.5 feet above mean sea level (msl) to 11 feet above msl. The Atlantic Ocean is located approximately 1,600 feet to the south of the property. The bulkhead area directly north of the property is adjacent to Jamaica Bay.

Storm water runoff generally drains to the center and to the southeast of the KeySpan property (Figure 3). Storm water collects in catch basins in the streets surrounding the property and flows into the New York City storm water drainage system and eventually flows to the north into Jamaica Bay near Beach 116th Street. Refer to the D&B RI report for more details.

1.3.1 Regional Geology

This section was based on information presented in the D&B RI Report.

The former MGP is located within the Atlantic Coastal Plain geomorphic province. There are approximately 980 feet of unconsolidated deposits overlying bedrock at the former MGP. The deposits underneath the former MGP generally consist of outwash deposits comprised of gravel and sand with lenses of finer materials. Recent deposits consisting of artificial fill, peat, shell bearing mud, silt, clay, wind- and wave-deposited sands, gravels, and shell fragments overlie the outwash deposits. Refer to the D&B RI Report for more regional geology details.

1.3.2 Regional Hydrogeology

There are four major aquifers in Rockaway peninsula identified as the Jameco, Lloyd, Magothy, and Upper Glacial aquifers. According to the D&B report, the regional hydrogeology of the Rockaway peninsula is characterized by groundwater flow north towards Jamaica Bay within the northern portions of the Peninsula and south towards the Atlantic Ocean in the southern portions. Regional hydraulic conductivities calculated within the outwash deposits underlying the site area average approximately 270 feet per day for horizontal flow and 27 feet per day for vertical flow. The water table is near or below sea level in the vicinity of the site. Water table conditions are encountered on Rockaway peninsula within the outwash deposits. Refer to D&B's report for more information regarding regional hydrogeology.

1.3.3 Climatology

A summary of the monthly climatologic records collected at John F. Kennedy Airport in Jamaica, Queens, New York over a 30-year period was reviewed. The airport is located approximately 4.5 miles to the northeast of the former MGP and its weather records are considered representative of weather conditions at the MGP. Table 1-1 summarizes the climatologic data for the airport. The average monthly maximum temperature was 59.2°F and the average monthly minimum temperature was 48.5°F. The lowest normal monthly maximum temperature was 39.6°F recorded for January and the highest normal monthly maximum was 78.7°F recorded for July. The annual precipitation (rainfall) for the area is 41.59 inches with the largest amount of precipitation of 3.90 inches, which occurs in April. Refer to D&B's report for more information.

1.4 Previous Investigations

Subsurface investigations have been conducted in the site area since 1989. The report findings of these investigations are summarized below.

1.4.1 Site Inspection Report, NUS Corporation, December 1989

The NUS Corporation, representing the United States Environmental Protection Agency (EPA), conducted a site inspection of the former MGP. The inspection was conducted in response to a LILCO notification letter to the EPA dated June 9, 1981 regarding MGP sites. The purpose of the inspection was to determine the potential presence of soil, surface water, and groundwater chemical constituents at the property.

Surface-soil samples were analyzed for the chemical constituents included in the EPA Contract Laboratory Program. Based on the site inspection and the soil sample analytical results, the Site Inspection Report concluded:

- A listing site inspection should be conducted based on the documented chemical constituents present in surficial soil and because the site fence was breached in several locations
- A threat of exposure to on site chemical constituents exists for a portion of the adjacent resident population
- Remedial Action is warranted prior to any additional site use/development activities

1.4.2 Phase I Site Investigation Report, GEI, January 1997

A Phase I Site Investigation Report was prepared by GEI for the Rockaway Park former MGP site. The purpose of the Phase I was to evaluate:

- The nature of chemical constituents in soil and groundwater
- Groundwater flow direction and shallow geology
- Potential off site contaminant migration
- Imminent risk to on site workers and the public
- Environmental conditions at eight former tank locations
- Applicability of an interim remedial measure (IRM)

The Phase I field investigation consisted of test pit excavation, groundwater well installation, soil boring advancement, and the collection of soil and groundwater samples for laboratory analysis. The Phase I report concluded the following:

- NAPL was observed in soil throughout most of the MGP property. BTEX and PAHs were detected in groundwater.
- Shallow deposits consisted of approximately 10 feet of fill overlaying native sand and groundwater flow was primarily to the south.
- Based on BTEX and PAH concentrations in soil at the southern boundary, chemical constituents were likely migrating off site.
- There was no imminent risk to on site workers or the public.
- At grade tank foundations appeared intact; however, the former tank location investigation was hindered due to shallow concrete encountered below grade.
- A buried former tar separator in the southern portion of the site was a likely candidate for an IRM.

1.4.3 Interim Remedial Measure Study, GEI, March 1999

An IRM study was prepared by GEI. As part of the IRM study, GEI conducted an investigation to quantify potential compounds of concern that could be encountered during construction activities at the former electric substation in the northeastern portion of the MGP property. The investigation was subsequently expanded to evaluate other areas of the site. The IRM field investigation consisted of test pit excavation, groundwater monitoring well installation, soil boring advancement and the collection of soil and groundwater samples for laboratory analysis. The IRM study concluded the following:

- Chemical constituents were detected at the water table in the eastern portion of the site and at deeper intervals in the former substation.
- Surface soil in the vicinity of the former substation contained PAHs and metals.
- Surface-soil samples collected between the former substation and the driveway contained PAHs and cyanide concentrations that represent a potential complete exposure pathway.
- A NAPL plume exists beneath the southwestern portion of the former substation and extends to the southwest. A second NAPL plume, potentially associated with drip oil or other solvent use at the former MGP, is located underneath the southeastern portion of the MGP property.
- The northwestern portion of the MGP property is the most suitable location for a future electric substation.

1.4.4 Substation Investigation Report and Delisting Petition, D&B, August 2000

D&B prepared a Substation Investigation Report and Delisting Petition. A risk assessment prepared by VHB was included as part of the report. The purpose of the report was to characterize the proposed electric substation area in the northwestern portion of the MGP property in order to support reclassifying this area of the property. The report was prepared

in accordance with the NYSDEC Organization and Delegation Memorandum No. 88-33. A field investigation was conducted that included advancing structural soil borings and obtaining subsurface-soil samples for laboratory analysis.

The risk assessment concluded that the construction worker subsurface-soil exposure at the proposed substation area does not pose an unacceptable carcinogenic health threat or noncancer health hazard.

In October 2000, the NYSDEC submitted a letter to KeySpan indicating the approval of KeySpan's request to reclassify the northwestern portion of the Rockaway Park former MGP site on the Registry of Inactive Hazardous Waste Disposal Sites.

1.4.5 Underground Feeder Cable Investigation Report

In June 2002, D&B prepared an Underground Feeder Cable Investigation Report. The investigation was conducted to evaluate the proposed underground feeder cable locations in portions of Beach 108th Street, Rockaway Freeway, and Beach Channel Drive. The investigation consisted of advancing soil and vapor probes, and soil and vapor laboratory analysis.

The laboratory analysis indicated BTEX was detected in some of the soil samples and the soil gas vapor samples. The laboratory analysis also indicated that the maximum concentrations of chemical constituents in soil and soil gas samples were detected in samples obtained between probes RPSB-79 and RPSV-20 in Rockaway Freeway (Plate 1).

1.4.6 New Substation Construction Support Activities, Foster Wheeler Environmental Corporation, November 2002

Foster Wheeler Environmental Corporation (Foster) prepared a "Rockaway Park Former Manufactured Gas Plant Site – New Substation Construction Support Activities" report in November 2002. The report documented excavation and oversight activities for the new electric substation construction.

Approximately 527 tons of solidified coal tar/bituminous material was excavated from the new electric substation in the northwestern portion of the MGP property. In addition, 750 cubic yards of visually impacted material and soil were excavated from the new substation.

1.4.7 Remedial Investigation

In October 2002, D&B prepared an RI report for KeySpan. The purpose of the report was to characterize site conditions, collect sufficient data to evaluate potential human exposure

pathways and environmental risk, and provide sufficient environmental data to evaluate remedial alternatives.

The field investigation included the following.

- Soil boring advancement and monitoring well installation
- Ambient air, soil vapor, soil and groundwater sampling and laboratory analysis

The RI report concluded the following:

- BTEX and PAHs were detected in surface and subsurface soils. The highest concentrations in soil were detected between 2 feet and 12 feet in the former gas works area, former oxide enclosure, and the former 2-million cubic-foot gas holder.

- BTEX and PAHs were detected in groundwater. The distribution of BTEX and PAH groundwater concentrations were generally consistent with the concentration of these compounds detected in soil. The highest BTEX and PAH groundwater concentrations were detected in the former gas works area, former oxide enclosure, and the former 2-million cubic-foot gas holder.

- NAPL was observed in a number of subsurface-soil samples collected within these areas. NAPL was observed in subsurface soil to a maximum depth of 116 feet within the former gas works area. Light NAPL (LNAPL) was observed as sheen on the groundwater in monitoring wells MW-05S, MW-12I, PZ-04 (located in former Gas Works Area), and MW-11S and MW-11D (Beach Channel Drive). Measurable LNAPL was observed in wells PZ-05 (0.16 ft) and PZ-08 (0.25 ft). Both of these wells were located in the former Gas Works Area. Dense NAPL (DNAPL) has been observed on the interface probe tip in monitoring wells MW-09D2 and MW-13S located in the former Gas Works area.

- BTEX and PAH concentrations detected in subsurface soil extend beyond the southeastern and southern site boundaries. PAH concentrations detected in subsurface soil extend beyond the northern site boundary.

- BTEX and PAH compounds are migrating off site in shallow groundwater to the east. PAH compounds and total cyanide are migrating off site in shallow groundwater (0 foot below ground surface [bgs] to 17 feet bgs) to the north.

- BTEX and PAH compounds are migrating off site in intermediate depth (17 feet bgs to 45 feet bgs) groundwater to the north and east. Total cyanide is migrating off site in intermediate depth groundwater to the north.

- BTEX and PAH compounds are migrating off site in deep groundwater (greater than 45 feet bgs) to the north.

- One of four ambient air samples contained detectable concentrations of targeted chemical compounds. Sample RPAA-01, obtained from the three-story office building, contained total xylenes and toluene concentrations.

- The soil gas sample analytical results suggest that BTEX migration in soil vapor is not considered a major transport mechanism at the site.

The RI report recommended that additional soil borings and groundwater wells be installed on and off site in order to delineate the nature and extent of potential compounds of concern at the former MGP.

2. Remedial Investigation Scope of Work

The Final RI was completed on the current KeySpan property and the surrounding areas listed in Section 1 (Figure 2, Plate 1). The Final RI scope of work included the completion of soil borings, installation of groundwater monitoring wells, subsurface-soil and surface-soil sampling, hydraulic conductivity testing, and groundwater sampling to characterize the soil and groundwater conditions. Also, sediment sampling was conducted in a portion of Jamaica Bay (Plate 2). The Final RI fieldwork was conducted between July 2002 and October 2002. Sampling locations were selected based on additional data requirements identified in the October 2002 D&B RI Report.

A Qualitative Human Exposure Assessment and a FWRIA were conducted and the results of these assessments were incorporated into this report. An Ecological Risk Assessment was conducted to address sediment samples collected from a portion of Jamaica Bay adjacent to the bulkhead area. The results of the Ecological Risk Assessment were incorporated into this final report.

The following sections generally describe the methods used for the sampling in accordance with the NYSDEC-approved work plan and addenda. Detailed field procedures are provided in the work plan and work plan addenda. Sample analyses were completed by Mitkem Corporation, located in Warwick, Rhode Island (a NYSDEC-approved laboratory).

2.1 Final RI Field Work

The Final RI Field Work consisted of drilling 27 subsurface-soil borings, drilling and installing 8 groundwater monitoring wells, and sampling at 3 surface-soil locations. Seventy-one subsurface-soil samples, 3 surface-soil samples, and 72 groundwater samples (collected from all previously existing and newly installed wells) were chemically analyzed to evaluate environmental conditions. Twenty-seven sediment samples were collected in the portion of Jamaica Bay adjacent to the bulkhead area and chemically analyzed to evaluate environmental conditions in these sediments.

During soil boring advancement, an air quality monitoring program was conducted in accordance with the provisions of the site-specific health and safety plan provided with the July 2002 work plan. The air-monitoring program included the collection of real-time air

quality data, time-averaged air quality data, and meteorological data to document potential migration routes of airborne volatile organic compounds (VOCs) and particulates.

Hydraulic conductivity testing was conducted on selected monitoring wells. Groundwater level measurements (at high and low tides) were obtained from all accessible monitoring wells in the site areas.

2.2 Field Methods

This subsection describes the sampling procedures and field methods used during the Final RI fieldwork. The procedures and methods were used in accordance with NYSDEC-approved RI work plan and addenda. For details refer to the approved RI work plan and addenda.

2.2.1 Air Monitoring

2.2.1.1 Perimeter Air Monitoring

The objective of the perimeter air monitoring was to prevent migration of potential airborne releases of compounds of concern to the downwind community (i.e., off site receptors, including residences and businesses and on site workers not involved with the site field activities).

Ambient air monitoring was completed during drilling operations. Two perimeter air quality stations (upwind and downwind) were set up for each boring location. A flame ionization detector (FID) was used to monitor the levels of organic vapors in the ambient air and a Mini RAM^{TM} PM-10 particle detector was used to count inhalable particles (0.1-10 micrometer range) of dust during the fieldwork. Each instrument was calibrated prior to use. The FID and Mini RAM readings were taken every 30 minutes during drilling operations. The perimeter air quality monitoring program was supplemental to, and discrete from, the air monitoring program implemented for purposes of evaluating worker health and safety. For more details refer to the approved Health and Safety Plan (HASP) submitted with the July 2002 Supplemental RI Work Plan.

2.2.1.2 Worker Health and Safety Air Quality Monitoring

Measurements were monitored from the breathing zone (4 to 5 feet above ground level) at each boring location during drilling operations to determine working conditions. A photoionization detector (PID) was used to monitor the levels of organic vapors in the work zone and a Mini-RAM™ PM-10 particle detector was used to monitor inhalable particulates (0.1 to 10 micrometer range) of dust during fieldwork. In addition, an LEL/O_2 meter was

used to measure lower explosive limit (LEL) and oxygen, and a Mini-Warn™ multigas meter was used to measure hydrogen cyanide and hydrogen sulfide during intrusive field activities. The instruments used to measure these parameters were calibrated before each use. For more details refer to the approved HASP submitted with the July 2002 Supplemental RI Work Plan.

Subsection 2.3 discusses the results of the air monitoring program

2.2.2 Soils (Borings and Surface)

This subsection describes the methodology used to collect soil samples during the RI. Table 2-1 identifies the rationale for conducting each boring, submittal of each sample for laboratory analysis, and the analyses completed for each sample. Generally, soils were logged and screened in accordance with the RI and Supplemental RI Work Plans. Selected soil samples were placed directly into certified pre-cleaned containers and placed directly into ice-filled coolers. The samples were then shipped to Mitkem for chemical analysis. Boring logs and monitoring well construction logs are presented in Appendix B.

2.2.2.1 Soil Borings

Twenty-seven borings were completed as part of the Final RI field investigation (including eight completed as monitoring wells). Table 2-1 provides the boring IDs as well as the rationale for the boring location and sampling. Soil boring samples were collected using GeoProbe®, Rotosonic™, and hollow-stem auger drilling methods. The objective of these borings was to evaluate subsurface conditions and to install monitoring wells to obtain groundwater samples.

Within each boring, soil samples were generally collected from intervals exhibiting the greatest observed occurrence of tar, staining, odors, sheen, and/or PID readings and from a deeper interval not exhibiting these physical observations. Soils with discrete intervals of observed tar, staining, sheen, odors, and/or PID detections, soils at the completion depth of selected borings, and soils from the water table interface were also submitted for analysis. Generally, soils were analyzed for BTEX, PAHs, and total cyanide as specified in the NYSDEC-approved Work Plan and addenda. In addition, the extract of subsurface-soil samples using the Synthetic Precipitation Leaching Procedure (SPLP) was analyzed for BTEX and PAH constituents. The SPLP analyses are intended to provide a relative evaluation of the potential leachability of various materials at the site. The results of the analyses will be used during preparation of the FS to evaluate the potential applicability of monitored natural attenuation. The SPLP analytical results will be included in the FS report.

Soils were logged, screened with a PID, and visual and olfactory observations were noted according to the work plan and addenda. At sampling locations that are overlain by pavement, sampling generally began immediately beneath the pavement and the underlying gravel base.

GeoProbe®, Rotosonic™, and hollow-stem auger drilling methods used are described in the NYSDEC-approved work plan and addenda and/or agreed to in the field by GEI representatives and the NYSDEC field representative.

2.2.2.2 Soil Borings/Monitoring Well Installation

Eight monitoring wells (RPMW-02D2, RPMW-07D2, RPMW-08D, RPMW-08D2, RPMW-14D2, RPMW-15D, RPMW-18I, and RPMW-18D) were completed using Rotosonic™ drilling methods. Monitoring wells RPMW-16I and RPMW-16S were installed on Rockaway Beach Boulevard because the original wells were destroyed during construction on private property. These wells were installed using hollow-stem auger drilling methods. Table 2-1 provides a summary of the rationale for the monitoring well locations. Appendix B presents the well construction logs.

Table 2-2 provides information on well depths and elevations, top of casing information, and screen depths and elevations. Following installation, each monitoring well was developed to remove silt and clays from the well and to stabilize the well filter pack. Development was done in accordance with the work plan and addenda.

Each well was completed as a 2-inch inner diameter (ID) monitoring well with flush-threaded polyvinyl chloride (PVC) 0.010-inch slotted screen, solid PVC riser, and a flush-mounted cover or a 5-foot steel stick-up. The annular space between the well screen, the borehole wall, and approximately 2 feet above the screen was backfilled with a sand pack. A 1- to 2-foot bentonite clay seal was placed above the sand pack. The thickness of the bentonite seal in some monitoring wells was less than specified in the work plan because of shallow groundwater conditions. The remaining annular space was filled to grade with a cement-bentonite grout slurry. A concrete pad surrounds each flush-mounted well cover or a locking protective standpipe. Each well was sealed with an expandable well cap that was secured with a padlock.

In order to evaluate different groundwater zones, wells were installed at different depths and were identified as shallow, intermediate, deep, and deep (2). Shallow wells straddle the groundwater table and were installed to a maximum depth of 17 feet bgs. Intermediate wells were installed to a maximum depth of 45 feet bgs. Deep wells were installed to a maximum depth of 90 feet bgs. Deep (2) wells were installed to a maximum depth of 125 feet bgs. The

purpose of evaluating these different groundwater zones was to supplement the findings of the previously submitted RI report.

2.2.2.3 Surface-Soil Sampling

Surface-soil sampling was completed at the former Electric Substation Area. Refer to Plate 1 for the surface-soil sample locations. Table 2-1 provides a summary of the rationale for surface-soil collection and analysis. The surface-soil samples were collected from the 0 to 2-inch soil interval beneath any gravel cover that was present. Surface-soil samples RPSS-17, RPSS-18, and RPSS-19 were analyzed for polychlorinated biphenyls (PCBs).

2.2.3 Groundwater

Groundwater samples were collected from all existing monitoring wells in September 2002. Wells PZ-07, RPMW-16S and RPMW-16I had been destroyed and well PZ-01 could not be located. The RPMW-16 monitoring well cluster was located in an area that was redeveloped and the wells were destroyed. The monitoring well cluster was replaced in October 2002 and groundwater samples were collected from the new wells. Table 2-2 provides a summary of monitoring well information, including the screened interval. Table 2-3 provides a summary of groundwater elevations obtained from wells during the September 2002 sampling round. Groundwater levels were obtained from all accessible wells at low and high tide on September 16, 2002 before groundwater sampling was conducted. A vehicle was parked on top of the RPMW-17 well cluster on September 16, 2002 during the groundwater level measurements of low and high tides.

At monitoring wells where groundwater was sampled, groundwater levels were measured prior to sampling, followed by purging and sampling of the monitoring wells. Groundwater depths were measured from the surveyed top of the PVC riser pipe for each well. Following sampling, the groundwater levels were again measured in each monitoring well. Sampling was completed in accordance with the NYSDEC-approved RI work plan and work plan addenda.

In addition to the groundwater samples obtained from the monitoring wells, grab groundwater samples were obtained from selected intervals during GeoProbe® boring advancement. Grab groundwater samples were obtained using a screen point sampler with a standard screen slot size of 0.004 inches and an exposed screen length of 41 inches. The screen point sampler was driven to the desired depth using a watertight system. Groundwater only passed through the screen point sampler screen at the depth interval specified. The samples were obtained based on the field observations of the subsurface soil recovered from the soil probes.

2.2.3.1 Purging

Sampling and purging monitoring wells was performed using low-flow methods employing a peristaltic pump with dedicated down hole tubing. Purging rates varied because of groundwater conditions; however, pumping rates generally ranged between 250 milliliters (mL) and 500 mL per minute in the groundwater. Regardless of the purge rate, draw down of the static water level was minimized as much as possible at all times.

A submersible stainless-steel Grundfos® pump with dedicated tubing was used to purge and sample groundwater in deep and deep (2) monitoring wells.

All wells were monitored for field parameters (temperature, pH, conductivity, dissolved oxygen, oxidation/reduction potential [ORP], and salinity) with flow-through cells during purging. In addition to these parameters, purge water from each well was monitored for turbidity. Measured flow rates and purge volumes were recorded concurrently with field parameter measurements. When at least three well volumes were purged and values of measured field parameters remained within a 10 percent difference over several consecutive readings, the well was sampled. Table 2-4 presents the final groundwater field parameter readings and physical observations of the purge water before the sample was collected.

2.2.3.2 Sampling

After each well was purged, groundwater samples were collected and placed into preserved containers provided by Mitkem. Groundwater samples were generally analyzed for BTEX, PAHs, and total cyanide. GeoProbe® grab groundwater samples were analyzed for BTEX, PAHs, and total cyanide.

Baseline natural attenuation parameters, including: alkalinity, total and dissolved manganese, dissolved ferrous iron and total iron, sulfate, and nitrate were measured for groundwater collected from the following monitoring wells:

RPMW-09I	RPMW-07D	RPMW-10I
RPMW-09D	RPMW-02S	PZ-03
RPMW-09D2	RPMW-02I	RPMW-15I
RPMW-12D	RPMW-02D	RPMW-16S
RPMW-12D2	MW-A	RPMW-16I
RPMW-07S	RPMW-06I	
RPMW-07I	RPMW-10S	

In addition, groundwater collected from monitoring wells RPMW-09I, RPMW-09D, RPMW-09D2, RPMW-16S, and RPMW-16I were analyzed for major inorganic ions (i.e., phosphate, chloride, bromide, iodide, sodium, potassium, calcium, magnesium, and dissolved

iron and speciation for ferric and ferrous ions) to support potential treatability analyses. The results of natural attenuation parameters and major inorganic ion analyses will be used during preparation of the FS.

LNAPL was observed in monitoring wells RPMW-11S and PZ-08; DNAPL was observed in PZ-08, RPMW-09I, RPMW-09D, RPMW-09D2, RPMW-07I, and RPMW-07D. A NAPL sample was submitted from RPMW-09D and RPMW-07D for laboratory analysis of BTEX, PAHs, total cyanide, density, and viscosity. The data will be used in future submittals to evaluate the selection of a potential remedial technology for the site.

2.2.4 Survey

At the conclusion of the final RI field activities, each boring and well location was surveyed by a KeySpan-employed New York State-licensed surveyor with reference to the New York State coordinate grid system. The lateral accuracy of the survey was 0.1 foot and the vertical accuracy was 0.01 foot. The data were tied into a United States Geological Survey (USGS) benchmark to ensure that all groundwater elevations are referenced to the National Geodetic Vertical Datum (NGVD) and the National Astronomic Vertical Datum (NAVD). A reference point on the bulkhead at the harbor was surveyed to facilitate monitoring of tidal fluctuations. Surface-soil sampling locations were field measured relative to known features.

2.2.5 Sediment

Shallow (3 to 5 feet deep) sediment samples were collected using vibracore sampling methods generally along three transects oriented perpendicular to the shore (Plate 2). Table 2-1 provides a summary of the rationale for sediment collection and analysis. Sample cores RPSED02-2 and RPSED02-3 were collected along a transect at the western portion of the site at approximately 50 and 75 feet from the bulkhead, respectively. Sample cores RPSED02-4 through RPSED02-6 were collected along a transect at the central portion of the site ranging from approximately 25 to 250 feet from the bulkhead. Per request from the NYSDEC site manager, RPSED02-1 was relocated to the central transect approximately 150 feet from the bulkhead to delineate RPSED02-6. Sample cores RPSED02-7 through RPSED02-9 were collected along a transect at the eastern portion of the site ranging from approximately 50 to 300 feet from the bulkhead. Refer to Appendix B for the sediment logs.

At each proposed sediment core location, a vibracore sampler was deployed from a boat equipped with Global Positioning System (GPS) navigation equipment to record the location of each sample point. The GPS coordinates were tied into the survey coordinate system used for the on site investigations.

Two samples from each core were analyzed for BTEX by EPA Method 8260, semivolatile organic compounds (SVOCs) by EPA Method 8270, total cyanide by contract laboratory program (CLP) methods, and total organic carbon (TOC). The cores were also submitted for pH by CLP methods, hardness and grain size analyses. Within each core, the top 0.3 foot was collected and analyzed for the above parameters. The remainder of the core was homogenized and submitted for laboratory analysis. Two additional soil samples were collected from RPSED02-6 due to the presence of slight sheen on the core barrel and a very slight naphthalene odor at the 1.9- to 2.4-foot interval. The samples were placed in coolers on ice and shipped to Mitkem for laboratory analysis.

Background surficial sediment samples were collected at eight locations (RPSEDBG-A through RPSEDBG-H) at random locations east and west of the site using a Shipek. Plate 2 presents the approximate location of each sample location. Table 2-1 provides a summary of the rationale for sediment collection and analysis. Refer to Appendix B for the sediment logs. Each background surficial sediment sample was submitted for laboratory analysis of BTEX by EPA Method 8260, SVOCs by EPA Method 8270, total cyanide by CLP methods, TOC, pH by CLP methods, hardness and grain size. The samples were placed in coolers on ice and shipped to Mitkem for laboratory analysis.

2.3 Air Monitoring and Health and Safety Findings

A perimeter air-monitoring plan and work zone monitoring plan were implemented at the site during each phase of intrusive field activities.

Air monitoring stations were placed upwind and downwind of each investigation work zone with continuous monitoring for VOCs and PM-10. Wind direction was determined using a flag mounted on a utility tower adjacent to the site. During excavation and materials handling operations, the air in work areas was also continuously monitored for the presence of potential contaminants. A portable PID or FID was utilized to periodically monitor the levels of organic vapors in the ambient air and a Mini RAM^{TM} PM-10 (or equivalent) particle detector was used to count inhalable particles (0.1-10 micrometer range) of dust during the fieldwork. In addition, hydrogen cyanide gas was monitored in the work zone continuously using a hand-held meter. Due to potential interference from sulfurs, hydrogen sulfide gas was also monitored for comparison to the hydrogen cyanide gas levels detected. All potential hydrogen cyanide gas detections were also confirmed with CMS Draeger tubes due to this interference.

2.3.1 Meteorological Observations

From July to October 2002 the temperature ranged from an average maximum temperature of 78.7°F in July, to an average minimum temperature of 52.4°F. Precipitation ranged from 3.8

inches per month in July to 2.88 inches per month in October. Localized rainfall events in August caused surface flooding in the interior of the site.

2.3.2 Perimeter Air Monitoring Findings

At no time during the investigation activities did VOC levels or PM-10 levels at the perimeter exceed the action levels in the air monitoring plan.

2.3.3 Worker Health and Safety Air Monitoring Results

At no time during the investigation activities did VOC levels or PM-10 levels in the work zone exceed the action levels in the air monitoring plan.

While installing boring RPSB-123, a strong organic odor was observed in the 100-foot to 104.5-foot soil sample interval. The HCN/H_2S Mini-Warn™ multi-meter was placed against the sample bag and a reading of 34.5 HCN / 0 H2S was observed. The work zone was immediately evacuated and a CMS Draeger tube was run for HCN. No detections of HCN were observed with the CMS Draeger tube in the work zone, against the sample bag, or inside the sample bag. However, the continuous reading HCN/H_2S Mini-Warn™ multi-meter recorded a detection of 44 parts per million (ppm) HCN/5 ppm H2S inside the sample bag. Work was continued with the meter in close proximity to the breathing zone of the worker closest to the sample media. The highest reading in the breathing zone of this worker for the duration of the sampling was 0.6 ppm. At no time was any HCN detected in the breathing zone of this worker with the CMS Draeger tubes. The soils were agitated in an attempt to isolate the apparent false positive readings of HCN on the HCN/H_2S Mini-Warn™ multi-meter and a momentary reading of 23 ppm HCN was achieved without a corresponding detection with either an HCN or H2S Draeger tubes.

The interferences for sulfur compounds such as sulfur dioxide and hydrogen sulfide provide the most common false positive readings for direct reading HCN meters; however, other sulfur compounds and even ammonia can cause similar order of magnitude interferences. The measured effects of this reading were not reproduced at any other site location and the exact cause of the interference was not determined; however, it was confirmed using the more accurate CMS Draeger tube that at no time during any of the investigation activities was HCN present above the action levels or the detection limits of the instrument.

3. Site Geology and Hydrogeology

This section documents the geology and hydrogeology beneath the site investigation areas.

3.1 Geology

Three major stratigraphic units were identified during the RI and Final RI drilling program:

- Recent/post glacial fill
- Barrier island deposits
- Glacial outwash deposits

The distribution of chemicals and environmental observations is described in Section 4. Detailed geologic descriptions and well construction details are provided in Appendix B.

A general description of the three stratigraphic units is provided below.

3.1.1 Fill

Fill material is distributed throughout the site investigation areas and was placed in a series of land area expansions from approximately the 1800s to the 1930s. The Sanborn maps indicate that approximately the northern two-thirds of the site investigation areas were part of Jamaica Bay in 1894. Retaining wall remnants are still present at the site and mark former bulkheads that supported these filling activities.

Fill material observed at the site consisted primarily of sand with minor amounts of finer and coarser material. The fill material also includes variable amounts of coal, tar coke, clinkers, slag wood, concrete, brick, ash, glass, and crushed shell fragments. Fill materials were encountered to approximately 10 to 15 feet bgs in most of the site areas. Fill was observed to approximately 30 feet bgs in the bulkhead area.

3.1.2 Barrier Island Deposits

Underlying the fill unit throughout much of the site are sandy, shell-bearing deposits interpreted as recent near-shore, beach, and dune deposits. These are identified as the barrier island deposits. The barrier island deposits contain minor amounts of silt and clay lenses. In

addition, shell-bearing layers ranging from approximately 2 feet to 29 feet thick were observed. These layers sometimes contained coarser sand and gravels. The barrier island deposits were observed through the depths of most borings in the site investigation areas. The deposits are approximately 55 to 70 feet thick throughout the site.

Underlying the barrier island deposits at approximately 55 to 70 feet bgs, a distinct color change was observed from gray to brown in borings located throughout the site. This was interpreted as a transition between the barrier island deposits and the glacial outwash deposits. The transitional zone is approximately 35 to 40 feet thick. Also a silty sand layer was observed between 65 and 95 feet bgs in this transitional layer.

3.1.3 Glacial Deposits

Underneath the transitional zone, glacial deposits consisting of primarily well-sorted brown outwash sands were encountered. The glacial deposits were encountered at approximately 95 to 105 feet bgs. Some silty sand lenses were observed in the borings at approximately 100 feet bgs in some of the borings.

3.2 Site Hydrogeology

There is one shallow, unconfined aquifer beneath the site. Wells were installed at consistent, yet arbitrary, depth intervals in order to evaluate different groundwater zones of the aquifer. The zones selected are identified as follows: shallow "S" (wells screened at the water table ranging from 2 to 17 feet), intermediate "I" (wells screened from 17 to 45 feet), deep "D" (wells screened from 45 to 90 feet), and deep (2) "D2" (wells screened from 90 to 105 feet). Groundwater depths were collected from all accessible monitoring wells at low and high tides based on the survey tidal mark and tide charts obtained from the National Oceanic and Atmospheric Administration (NOAA). Table 2-3 provides the groundwater depths and elevations from the September 2002 sampling round. Groundwater elevations at low and high tides for each groundwater zone ranged from the following.

Shallow – Low tide groundwater elevations ranged from 0.71 ft (RPMW-01S) to 2.29 ft (PZ-05). High tide groundwater elevations ranged from 1.27 ft (RPMW-03S) to 2.85 ft (PZ-05).

Intermediate – Low tide groundwater elevations ranged from 0.28 ft (RPMW-02I) to 2.15 ft (RPMW-13I). High tide groundwater elevations ranged from 2.03 ft (RPMW-04I) to 3.4 ft (RPMW-11I).

Deep – Low tide groundwater elevations ranged from -0.29 ft (RPMW-11D) to 1.49 ft (RPMW-13D). High tide groundwater elevations ranged from 1.6 ft (RPMW-15D) to 2.91 ft (RPMW-02D).

Deep (2) – Low tide groundwater elevations ranged from 0.7 ft (RPMW-09D2) to 1.75 ft (RPMW-14D2). High tide groundwater elevations ranged from 1.74 ft (RPMW-12D2) to 3.6 ft (RPMW-02D2).

The groundwater elevation data indicate that, generally, for all groundwater intervals at high tide, groundwater flows to the south away from Jamaica Bay. The data also indicate that groundwater generally flows to the north towards Jamaica Bay at low tide. Groundwater elevation data also indicate minor differences in head potential between some of the groundwater zones, indicating that subtle textural differences in the aquifer and likely tidal influences have resulted in subtle semi-confining conditions between the zones.

In-situ hydraulic conductivity tests (slug tests) were conducted at the following well clusters: RPMW-10S/I, RPMW-02S/I/D, and RPMW-12S/I/D/D2. The shallow wells were installed in fill consisting of sand with varying amounts of gravel of finer material and debris. The intermediate wells were installed primarily in the barrier island deposits consisting of sand with shell beds and gravel. The deep wells were installed primarily in the barrier island deposits and glacial outwash deposits consisting of silty sand. The tests were conducted to estimate the hydraulic conductivity at the site and to assist in evaluating remedial alternatives for the FS. The July 2002 work plan addendum indicated that well clusters RPMW-07 and RPMW-09, in addition to RPMW-10, were to have hydraulic conductivity tests conducted on them. However, due to the presence of DNAPL in these clusters, the well clusters RPMW-02 and RPMW-12 were selected to conduct the tests.

Based on the slug tests completed, the hydraulic conductivities ranged from 9.0 feet/day at RPMW-10S to 65.8 feet/day at RPMW-02D. The higher hydraulic conductivity values corresponded with wells that were screened in coarser shell-bearing zones. The lowest hydraulic conductivity values were measured in the Deep (2) well (glacial outwash) where finer silt lenses were observed within the screened intervals. A summary of hydraulic conductivities is presented in Table 3-1. Appendix C includes the slug test data files and the hydraulic conductivity calculations.

The average horizontal hydraulic gradients were shallow, indicating a flat groundwater table in all the monitoring zones at both low and high tides. The groundwater zone gradient ranges are as follows:

- Shallow - 0.002 to 0.008 ft/ft
- Intermediate – 0.002 to 0.007 ft/ft

- Deep – 0.001 to 0.003 ft/ft
- Deep (2) – 0.002 to 0.004 ft/ft

Average linear flow velocities for the water table aquifer were calculated based on the measured hydraulic conductivities and the horizontal hydraulic gradients using the following equation:

$$V = ki/n$$

where:

k = hydraulic conductivity of the formation
i = hydraulic gradient
n = effective porosity of the formation

The average linear flow velocity of the groundwater zones were calculated assuming an effective porosity of 30%, an average hydraulic gradient of 0.003 foot/foot (shallow), 0.004 foot/foot (intermediate), 0.002 foot/foot (deep), 0.003 foot/foot (deep (2)) and the average calculated hydraulic conductivity from shallow wells RPMW-10S/02S/12S (19.8 feet/day), intermediate wells RPMW-10I/02I/12I (40.1 feet/day), deep wells RPMW-02D/12D (39.2 feet/day), and deep (2) wells RPMW-02D2/12D2 (19.2 feet/day). The calculated average linear flow velocities of the groundwater zones are as follows: shallow (72.3 feet/year), intermediate (195 feet/year), deep (95.4 feet/year), and deep (2) (70.1 feet/year).

3.2.1 Tidal Study

A tidal study was conducted by D&B at the site in March 2000. This section provides a summary of D&B's study. Refer to D&B's October 2002 RI Report for more details.

The tidal study was conducted to evaluate tidal influence on the groundwater at the site. The tidal study was conducted at the site in March 2000 after a full moon when tidal fluctuations would be expected to be close to their maximum range. The study was conducted over a 48-hour period. Nine shallow wells, two intermediate wells, and one deep well were selected for water level monitoring as part of the study. A tidal gauge was affixed to the bulkhead adjacent to Jamaica Bay in order to measure tidal fluctuations of the surface water.

The water levels fluctuated (between low and high tides) as much as 2.25 feet in intermediate wells and as much as approximately 2.6 feet in the deep well RPMW-07D. Monitoring well RPMW-07D also had a cyclic fluctuation lag time of 18 minutes.

The shallow wells displayed the least tidal influence. The shallow monitoring wells generally fluctuated less than 1 foot; however, monitoring well RPMW-04S fluctuated approximately 1.25 feet. Shallow monitoring wells located a greater distance from Jamaica Bay in the southern portion of the site exhibited the least fluctuation generally less than 0.5 foot. The shallow wells displayed a cyclic fluctuation lag time of approximately 0.5 to 1 hour. Lag times were lowest at the wells closest to Jamaica Bay.

The tidal study results indicated that the intermediate and deep monitoring wells screened in the barrier island deposits displayed the greatest tidal influence.

3.2.2 Shallow Groundwater

The groundwater contour pattern for the shallow groundwater at low tide is depicted in Plate 3 and the shallow groundwater at high tide is depicted in Plate 4. Groundwater elevation differences in each well at low and high tide ranged from 0.07 foot in RPMW-05S to 1.69 feet in RPMW-01S.

Shallow groundwater at low tide generally flows to the north towards Jamaica Bay. Horizontal hydraulic gradients are generally consistent across the site and range between 0.002 foot/foot and 0.004 foot/foot. The highest gradients are located near the bulkhead area. At high tide, the shallow groundwater contour map (Plate 4) depicts the presence of a groundwater divide (or trough) on the site. This trough is the result of high tidal levels within the channel causing shallow groundwater to flow southerly toward the site. However, this effect does not "over-ride" the dominant shallow discharge pattern toward Jamaica Bay across the entire site, thus creating a localized trough. South of the trough, on the western portion of the site, groundwater flows westerly, while on the eastern portion of the site, groundwater flows easterly. The horizontal gradients are generally consistent across the site and are approximately 0.002 foot/foot.

3.2.3 Intermediate Groundwater

The groundwater contour pattern for the intermediate groundwater at low tide is depicted in Plate 5 and the intermediate groundwater at high tide is depicted in Plate 4. Groundwater elevation differences in each well at low and high tide ranged from 0.5 foot in RPMW-14I to 3.05 feet in RPMW-11I.

Intermediate groundwater at low tide generally flows to the north towards Jamaica Bay. Horizontal hydraulic gradients are generally consistent across the site and range between 0.003 foot/foot and 0.007 foot/foot. The highest gradients are located near the current substation located in the northeastern portion of the site.

Intermediate groundwater at high tide generally flows south away from Jamaica Bay. However, similar to the shallow groundwater at high tide, groundwater in the northwestern portion of the site flows to the south and west. In the northeastern portion of the site, the groundwater flows to the south and east. The horizontal gradients are generally consistent across the site and range between 0.003 foot/foot and 0.007 foot/foot. The highest gradients are located in the northwestern portion of the site.

3.2.4 Deep Groundwater

The groundwater contour pattern for the deep groundwater at low tide is depicted in Plate 6 and the deep groundwater contour pattern at high tide is depicted in Plate 4. Groundwater elevation differences in each well at low and high tide ranged from 0.52 foot in RPMW-14D to 2.98 feet in RPMW-02D.

Deep groundwater at low tide generally flows northerly towards Jamaica Bay. The horizontal hydraulic gradients are generally consistent across the site at approximately 0.003 foot/foot. Deep groundwater at high tide generally flows south away from Jamaica Bay. The horizontal gradients are generally consistent across the site and range between 0.002 foot/foot and 0.004 foot/foot. The highest gradients are located in the southern portion of the site.

3.2.5 Deep (2) Groundwater

The groundwater contour pattern for the deep (2) groundwater at low tide is depicted in Plate 7 and the deep (2) groundwater at high tide is depicted in Plate 4. Groundwater elevation differences in each well at low and high tide ranged from 0.64 foot in RPMW-14D2 to 2.87 feet in RPMW-02D2.

Deep (2) groundwater at low tide generally flows northwesterly towards Jamaica Bay. The horizontal hydraulic gradients are generally consistent across the site, ranging from 0.002 foot/foot to 0.004 foot/foot. The highest gradients are located in the southern portion of the site.

Deep groundwater at high tide generally flows south to southwesterly away from Jamaica Bay. The horizontal gradients are generally consistent across the site at approximately 0.002 foot/foot.

3.2.6 Vertical Head Potentials and Gradients

The vertical hydraulic head potentials and gradients between the different groundwater zones, shallow to intermediate, intermediate to deep, and deep to deep (2) were calculated for

the well clusters at both low and high tides. Refer to Table 3-2 for the vertical hydraulic head differential and gradients.

The shallow to intermediate vertical head differentials ranged from 0.1 foot (RPMW-12S/I) to 1.42 feet (RPMW-04S/I) at low tide and from –0.05 foot (RPMW-12S/I) to –1.39 feet (RPMW-05S/I) at high tide. The head differentials were greatest in well clusters located in the northern portion of the site, where tidal variation was greatest.

The shallow to intermediate groundwater vertical gradients indicated a downward potential at low tide and an upward potential at high tide, except for well cluster RPMW-04S/I. The vertical potential head gradients ranged from 0.001 foot (RPMW-013S/I) to 0.047 foot (RPMW-04S/I) at low tide and from -0.002 foot (RPMW-012S/I & RPMW-014S/I) to -0.057 foot (RPMW-02S/I) at high tide. Vertical potential head gradients were greatest in well clusters located in the northern portion of the site.

The intermediate to deep vertical head differentials ranged from -0.05 foot (RPMW-03I/D) to 0.82 foot (RPMW-07I/D) at low tide and from -0.07 foot (RPMW-18I/D) to 0.78 foot (RPMW-09I/D). The head differentials were greatest in well clusters located in the southern portion of the site.

Generally, the intermediate to deep groundwater zone indicated a downward potential head gradient at low and high tide. Well cluster RPMW-03I/D at low/high tides and RPMW-18I/D at low tide indicated a potential upward head gradient. The vertical potential head gradients ranged from -0.002 foot (RPMW-03I/D) to 0.27 foot (RPMW-09I/D) at low tide and from –0.002 foot (RPMW-018I/D) to –0.24 foot (RPMW-11I/D). The potential head gradients were generally consistent across the site. The wells that exhibited the least potential gradient change were located in the northern portion of the site.

The deep to deep (2) vertical head differentials ranged from 0.22 foot (RPMW-09D/D2) to 0.69 foot (RPMW-002D/D2) at low tide and from 0.11 foot (RPMW-09D/D2) to -0.61 foot (RPMW-07D/D2) at high tide. The head differentials were greatest in well clusters located in the southern portion of the site.

Generally, the deep to deep (2) groundwater zone indicated a downward potential head gradient at low and high tide. Well cluster RPMW-07D/D2 at low and high tides indicated a potential upward head gradient. The vertical potential head gradients ranged from 0.007 foot (RPMW-09D/D2) to 0.022 foot (RPMW-02D/D2) at low tide and from 0.004 foot (RPMW-09D/D2) to -0.020 foot (RPMW-07D/D2). The potential head gradients were greatest in well clusters RPMW-02D/D2, RPMW-07D/D2 and RPMW-14D/D2.

4. Nature and Extent

This section discusses the degree and extent of observed tar, staining, sheen, odors, and chemical constituents detected during the field investigations at the site from 1989 to the present. The sample locations are shown on Plate 1.

The following terminology and descriptions were used to describe the visual and olfactory observations made during the final RI field investigation. These terms are also used in this report section to describe the nature of the observed materials.

- **Saturated:** the entirety of the 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 sample. The majority of the soil matrix did not exhibit the presence of NAPL beyond these discrete blebs. 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:** iridescence was observed within a soil sample. Sheens are typically noted in moist to wet soils.

- **Odor:** if an odor was observed, it was described based on its relative intensity and characteristics. Modifier terms such as strong, moderate, and faint were used to describe relative odor intensity. Descriptive terms such as tar-like or petroleum-like odors were also used.

Subsection 4.1 discusses the soil findings and is subdivided by geographic site areas. The soil findings for each site area are further divided into surface-soil and subsurface-soil sections. Subsection 4.4 discusses groundwater conditions for the entire site.

The nature and extent of the chemical constituents is determined by the geologic conditions, groundwater flow patterns, and historic parcel use, processes and structures located at the

site. During the drilling of soil borings and the excavation of test pits, tar-saturated soil, staining from tar, and odors characteristic of tar were observed at various locations. These physical observations were recorded on the boring and test pit logs included in Appendix B. These observations were summarized on the lateral extent maps by depth interval on Plates 8, 9, 10, 11, and 12 and geologic cross-sections A-A′ through E-E′ on Plates 13, 14, and 15.

In addition to the physical observations, this section also discusses the analytical results of the subsurface-soil, surface-soil, and groundwater samples collected during the RI and previous sampling programs. Tables 4-1 through 4-36 present the detected laboratory analytical results for surface-soil and subsurface-soil samples. Tables 4-37 through 4-40 present the detected laboratory analytical results for groundwater samples. Tables 4-41 and 4-42 present the detected laboratory analytical results for sediment samples. Table 4-43 presents a statistical summary of the analyses performed for each media. Appendices D, E, and F present the chain-of-custody forms and data validation reports. The validated laboratory Form I reports are presented under a separate cover.

BTEX compounds were the principal VOCs detected and are the common VOCs associated with tar. SVOCs were also detected at the site with PAHs being the common subset of SVOCs in 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
- Benz(a)anthracene
- Dibenz(a,h)anthracene
- Pyrene
- Benzo(a)pyrene
- Fluoranthene

Of these PAHs, the following constituents are considered carcinogenic PAHs by EPA.

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

The analytical results of the RI and previous investigations are discussed relative to the total BTEX, total PAHs (TPAH), and total carcinogenic PAHs (CPAH).

Tables 4-1 through 4-36 include the sum of PAHs, the sum of carcinogenic PAHs, sum of the non-carcinogenic PAHs, and the sum of BTEX constituents for surface soil and subsurface soil, along with the analytical results for individual analytes. For non-detect results ("U" qualified), the value used in these sums was 0.00. For estimated values ("J" qualified), the value used in the sums was the numerical result for each analyte.

At the request of the NYSDEC, a comparison of detected analytes to the New York State Recommended Soil Cleanup Objectives (RSCOs) was also completed. The individual compound exceedances were highlighted and bolded on the tables.

Tables 4-37 through 4-40 include the sum of PAHs, carcinogenic PAHs, non-carcinogenic PAHs and BTEX for groundwater, along with the analytical results for individual analytes. At the request of the NYSDEC, a comparison of detected analytes to the New York State Ambient Groundwater Quality Standards (NYSWQS) and guidance values for a GA area for all groundwater samples collected was completed. Individual compound exceedances have been highlighted and bolded in the table.

Table 4-41 includes the sum of PAHs, carcinogenic PAHs, non-carcinogenic PAHs and BTEX for sediments, along with the analytical results for individual analytes. A relative comparison to site and background conditions was performed for all of the sediment samples collected in Jamaica Bay.

4.1 Soil

Soil samples were collected from the seven geographic site areas. The boundaries of each area are described in subsection 1.2.2. For the purposes of this Final RI, observations of impacts and analytical results from samples collected in each of these areas were further subdivided into five depth intervals. The five depth intervals, 0- to 12-feet bgs, 12- to 24-feet bgs, 24- to 45-feet bgs, 45- to 90-feet bgs, and greater than 90-feet bgs are presented on Plates 8 through 12 respectively. The sections below address each of the site areas with respect to these depth intervals.

Tar-saturated soil, free tar, blebs, sheens, staining, and odors were observed in site soils. Tar-saturated soils at the site were generally limited to the fill material in the shallow soils and the coarse sand and shell-baring layers within the barrier island deposits. The thickness of the layers of coarse sand and shell-baring layers ranged from several feet to less than one inch, creating a range of subhorizontal tar-saturated lenses in the subsurface. Few impacts were observed in the glacial outwash deposits at depth. The physical observations and distribution of detected analytes are compared in each interval and described below.

4.1.1 Former Gas Works Area

This area of the site contains the footprint of the former MGP. Former structures associated with this area included several gas holders, purifiers, tar separators, and a skimming basin. The physical observations of contamination in subsurface soils indicate the presence of two areas of tar-saturated soil. These areas fall within the vicinity of the former holders and tar separators and the vicinity of the skimming basin. The tar-saturated soils in these areas do not appear to be continuous; however, blebs, lenses, sheens, and grain-coated soils were observed below the former holders/tar separators and the skimming basin at the 0 to 12-foot and 24- to 45-foot intervals. Tar-saturated soils extend to depths of 121 feet bgs near the former tar separator (RPSB-123), 106 feet bgs near the former 60,000-cubic-foot gas holders (RPSB-44), and 67 feet bgs near the former skimming basin (RPSB-119). In addition, evidence of fuel oil contamination, including LNAPL, odor, and sheens, was observed in borings within the fill material in the vicinity of the former tar separator and former skimming basin.

Tables 4-1 to 4-5 present the analytical results of samples collected in this area.

Concentrations of TPAHs in subsurface soils from 0 to 12 feet bgs in this area ranged from non-detect in samples RPSB-90 and RPSB-91 to 25,820 mg/kg in sample RPSB-09 (2 to 4 feet bgs). CPAH ranged from non-detect in samples RPSB-90 and RPSB-91 to 1,926.8 mg/kg in sample RPSB-09 (2- to 4-foot bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 3,870 mg/kg in sample TP-06B (4.5- to 5-foot bgs). Total cyanide ranged from non-detect in several samples to 152 mg/kg in sample TP-13B (2 to 4 feet bgs).

Concentrations of TPAHs in subsurface soils from 12 to 24 feet bgs in this area ranged from non-detect in samples RPSB-21 and RPSB-67 to 21,490 mg/kg in sample RPSB-12 (14 to 16 feet bgs). CPAH ranged from non-detect in several samples to 1,840 mg/kg in sample RPSB-12 (14 to 16 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in samples RPSB-10, RPSB-21, and RPSB-67 to 2,474 mg/kg in sample RPSB-12 (14 to 16 feet bgs). Total cyanide ranged from non-detect in several samples to 2.5 mg/kg in sample RPSB-12 (14 to 16 feet bgs).

Concentrations of TPAHs in subsurface soils from 24 to 45 feet bgs in this area ranged from non-detect in sample RPSB-122 to 3,661 mg/kg in sample RPSB-118 (26 to 27 feet bgs). CPAH ranged from non-detect in several samples to 296 mg/kg in sample RPSB-118 (26 to 27 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in samples RPSB-09, RPSB-27, and RPSB-122 to 564 mg/kg in sample RPSB-118 (26 to 27 feet bgs). Total cyanide ranged from non-detect in several samples to 0.82 mg/kg in sample RPSB-46.

Concentrations of TPAHs in subsurface soils from 45 to 90 feet bgs in this area ranged from non-detect in several samples to 8,996 mg/kg in sample RPSB-22 (60 to 62 feet bgs). CPAH ranged from non-detect in several samples to 1,303 mg/kg in sample RPSB-17 (50 to 52 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 104.2 mg/kg in sample RPMW-07D2 (68 to 69 feet bgs). Total cyanide ranged from non-detect in several samples to 1.1 mg/kg in sample RPSB-46.

Concentrations of TPAHs in subsurface soils greater than 90 feet bgs in this area ranged from non-detect in several samples to 11,030 mg/kg in sample RPSB-123 (116 to 126 feet bgs). CPAH ranged from non-detect in several samples to 954 mg/kg in sample RPSB-123 (116 to 126 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 775 mg/kg in sample RPSB-123 (116 to 126 feet bgs). Total cyanide ranged from non-detect in several samples to 0.43B mg/kg in sample RPSB-123 (116 to 126 feet bgs).

4.1.2 Former Electric Substation Area

This area includes a former electric substation and former garage. According to historical Sanborn Maps and photographs, no former MGP structures were located in this area. However, historical photographs indicate that landfilling processes occurred in this area. The physical observations of contamination in subsurface soils indicate the presence of generally one area of tar-saturated soil. The tar-saturated soils are primarily located in the western and central portion of this area. Tar-saturated soils were observed from approximately 6 feet bgs at test pit TP-2A(C) to 67 feet bgs at boring RPSB-125. The most extensive lateral area of tar-saturated soil was observed in the 0- to 12-foot interval. In this interval, the tar-saturated materials extend south into the former 2-million cubic foot holder and drip tank area and west towards the former skimming basin. In addition, evidence of fuel oil contamination, odor and sheens, was observed in borings in this interval within the fill material.

The lateral extent of tar saturated material within the 12- to 24-foot interval was less extensive; however, there appears to be some continuity between the tar-saturated material in this interval of the former electric substation area and the saturated materials identified in the vicinity of the former skimming basin. Blebs, lenses, sheens, and grain-coated soils were also observed extending across the area between boring RPSB-129 and borings RPMW-18D and RPSB-125 within this interval. Two discontinuous areas of tar-saturated soils extend below the 12- to 24-foot interval at boring RPSB-129 and at borings RPSB-125 and RPMW-18D. An isolated observation of lenses of tar-saturated material was made at boring RPSB-13 from 12 to 20 feet bgs and from 26 to 32 feet bgs.

Tables 4-6 to 4-10 present the analytical results of samples collected in this area.

Concentrations of TPAHs in subsurface soils from 0 to 12 feet bgs in this area ranged from

non-detect in several samples to 3,545.06 mg/kg in sample TP-19B (8 to 8.5 feet bgs). CPAH ranged from non-detect in several samples to 415.56 mg/kg in sample TP-19B (8 to 8.5 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 2,222 mg/kg in sample TP-19B. Total cyanide ranged from non-detect in several samples to 262 mg/kg in sample TP-01C.

Concentrations of TPAHs in subsurface soils from 12 to 24 feet bgs in this area ranged from 0.047 mg/kg in sample B-04 (22 to 24 feet bgs) to 2,632.3 mg/kg in sample RPSB-125 (17 to 25 feet bgs). CPAH ranged from non-detect in sample B-04 to 160.7 mg/kg in sample RPSB-125 (17 to 25 feet bgs). Concentrations of BTEX in subsurface soils ranged from 0.007 mg/kg in sample B-04 (22 to 24 feet bgs) to 179 mg/kg in sample RPSB-129 (15 to 17 feet bgs). Total cyanide was not detected in any samples in this interval.

Concentrations of TPAHs in subsurface soils from 24 to 45 feet bgs in this area ranged from non-detect in several samples to 3,174.7 mg/kg in sample BOR-B (29 to 30 feet bgs). CPAH ranged from non-detect in several samples to 242.8 mg/kg in sample BOR-B (29 to 30 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 165 mg/kg in sample RPSB-125 (25 to 27 feet bgs). Total cyanide ranged from non-detect in several samples to 0.32B mg/kg in sample RPSB-129 (37 to 47 feet bgs).

Concentrations of TPAHs in subsurface soils from 45 to 90 feet bgs in this area ranged from non-detect in samples RPSB-19 (45 to 47 feet bgs) and RPSB-126 (45 to 57 feet bgs) to 2,397.4 mg/kg in sample RPMW-18D (52 to 55 feet bgs). CPAH ranged from non-detect in samples RPSB-19 and RPSB-126 to 189 mg/kg in sample RPMW-18D. Concentrations of BTEX in subsurface soils ranged from 0.003 mg/kg in sample RPSB-19 to 54.5 mg/kg in sample RPMW-18D. Total cyanide ranged from non-detect in several samples to 0.058 mg/kg in sample RPSB-19.

Two samples, RPMW-18D (87 to 97 feet bgs) and RPSB-129 (87 to 97 feet bgs), were collected from subsurface soils greater than 90 feet bgs in this area. Neither sample contained detectable concentrations of TPAHs, CPAH, BTEX, or total cyanide. BTEX was detected in RPSB-129 (87 to 97 feet bgs) at 0.024 mg/kg.

4.1.3 Former 2-Million Cubic-Foot Holder and Drip Tank Area

This area includes an active natural gas regulator station located at the southeastern corner of the site. According to historical Sanborn Maps and photographs, a 2-million cubic-foot gas holder, various drip oil tanks and pits, and an oxide enclosure were located in this area. The holder slab is present at grade. The physical observations of contamination in subsurface soils indicate the presence of fuel oil contamination and tar-saturated soil. Strong fuel oil odors and sheens are present in shallow subsurface soils in the 0 to 12-foot interval, while

tar-saturated soils are present in the vicinity of the current regulator station and the former drip tanks, and along the northern boundary of this area. There is no evidence in borings installed through or around the base of the 2-million cubic-foot holder pad that the holder was a source of tar to the subsurface. The tar-saturated soils in these areas are not continuous. The tar-saturated material located along the northern boundary of this area is an extension of the impacts described in subsection 4.1.2, which were likely the result of deposition during the filling activities in this area. The impacts located along the Beach 108th Street appear to be related to the former drip tanks that were located in this area during plant operations and are evidenced by the impacts in borings RPSB-40, B-19, and RPSB-54. Thin lenses of tar saturated material and sheens extend in the area between these borings, but significant tar-saturated zones were not encountered in any of the borings in this area. Borings installed along and within Beach 108th Street did not show any evidence of similar impacts extending beyond the current KeySpan property from the drip tanks.

Tables 4-11 to 4-15 present the analytical results of samples collected in this area.

Concentrations of TPAHs in subsurface soils from 0 to 12 feet bgs in this area ranged from non-detect in several samples to 15,684 mg/kg in sample RPSB-20 (9 to 9.5 feet bgs). CPAH ranged from non-detect in several samples to 2,204 mg/kg in sample RPSB-20. Concentrations of BTEX in subsurface soils ranged from 0.002 mg/kg in sample RPSB-26 (4 to 6 feet bgs) to 10,640 mg/kg in sample B-23 (9.5 to 10 feet bgs). Total cyanide ranged from non-detect in several samples to 8 mg/kg in sample RPSB-32 (2 to 4 feet bgs).

Concentrations of TPAHs in subsurface soils from 12 to 24 feet bgs in this area ranged from non-detect in several samples to 125.49 mg/kg in sample B-23 (11 to 13 feet bgs). CPAH ranged from non-detect in several samples to 11.95 mg/kg in sample B-23. Concentrations of BTEX in subsurface soils ranged from 0.005 mg/kg in sample RPSB-48 (22 to 24 feet bgs) to 92.6 mg/kg in sample B-23. Total cyanide ranged from non-detect in several samples to 35.8 mg/kg in sample B-23.

Concentrations of TPAHs in subsurface soils from 24- to 45-feet bgs in this area ranged from non-detect in several samples to 29.76 mg/kg in sample RPSB-47 (40 to 42 feet bgs). CPAH ranged from non-detect in several samples to 5.81 mg/kg in sample RPSB-47. Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 0.307 mg/kg in sample B-05 (23 to 25 feet bgs). Total cyanide ranged from non-detect in several samples to 0.34B mg/kg in sample RPSB-52 (42 to 44 feet bgs).

Concentrations of TPAHs in subsurface soils from 45 to 90 feet bgs in this area ranged from non-detect in several samples to 0.302 mg/kg in sample RPSB-25 (50 to 52 feet bgs). CPAHs were not detected in any samples collected in this interval. Concentrations of BTEX in subsurface soils ranged from non-detect in sample RPMW-14D2 (67 to 77 feet bgs) to

0.056 mg/kg in sample RPSB-54 (50 to 62 feet bgs). Total cyanide ranged from non-detect in several samples to 0.24B mg/kg in sample RPSB-48 (45 to 47 feet bgs).

One sample, RPMW-14D2 (97 to 107 feet bgs), was collected from the subsurface soils greater than 90 feet bgs in this area. The concentration of BTEX was 0.007 mg/kg in the sample and the concentration of TPAH was 0.042 mg/kg. CPAHs and total cyanide were not detected in this sample.

4.1.4 Current Electric Substation Area

This area of the site contains an active electric substation. According to historical Sanborn Maps and photographs, no former MGP structures were located in this area. However, historical photographs indicate that landfilling processes occurred in this area. Solid tar was observed in test pits in the western portion of the area down to 8 feet bgs. Staining and odor were observed in eight borings located throughout the area to 16 feet bgs. No impacts were observed from 16 to 42 feet bgs.

Impacted soils from this area were excavated and disposed of off site during construction of the new substation. These activities are documented in the following report*: Draft Summary Report for Rockaway Park Former Manufactured Gas Plant Site, LIPA Rockaway Beach Substation, Construction Environmental Support Activities*, prepared for KeySpan Corporation by Foster Wheeler Environmental Corporation, dated November 2002.

Tables 4-16 to 4-19 present the analytical results of samples collected in this area.

Concentrations of TPAHs in subsurface soils from 0 to 12 feet bgs in this area ranged from non-detect in several samples to 92.02 mg/kg in sample RPSB-66 (6 to 8 feet bgs). CPAH ranged from non-detect in several samples to 26.42 mg/kg in sample RPSB-66. Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 31.5 mg/kg in sample B-13 (8.2 to 8.5 feet bgs). Total cyanide ranged from non-detect in several samples to 2.5 mg/kg in sample RPSB-72 (4 to 6 feet bgs).

Concentrations of TPAHs in subsurface soils from 12 to 24 feet bgs in this area ranged from non-detect in samples RPSB-64 (14 to 16 feet bgs and RPSB-65 (14 to 16 feet bgs) to 0.573 mg/kg in sample RPSB-08. CPAH ranged from non-detect in several samples to 0.255 mg/kg in sample B-15 (13 to 15 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 0.234 mg/kg in sample RPSB-66 (14 to 16 feet bgs). Total cyanide ranged from non-detect in several samples to 0.68B mg/kg in sample RPSB-65 (14 to 16 feet bgs).

Concentrations of TPAHs in subsurface soils from 24 to 45 feet bgs in this area ranged from

non-detect in several samples to 0.741 mg/kg in sample RPSB-08 (30 to 32 feet bgs). CPAH ranged from non-detect in several samples to 0.147 mg/kg in sample RPSB-08 (30 to 32 feet bgs). Concentrations of BTEX in subsurface soils ranged from 0.002 mg/kg in sample RPSB-14 to 0.018 mg/kg in sample RPSB-08. Total cyanide was not detected in any samples collected in this interval.

Two samples, RPSB-89 (49 to 51 feet bgs) and RPSB-89 (59 to 61 feet bgs), were collected from the subsurface soils from 45 to 90 feet bgs in this area. The concentrations of BTEX were 0.025 mg/kg at RPSB-89 (49 to 51 feet bgs) and 0.003 mg/kg at RPSB-89 (57 to 61 feet bgs). TPAHs were detected in RPSB-89 (49 to 51 feet bgs) at a concentration of 0.579 mg/kg. CPAHs and total cyanide were not detected in either sample.

4.1.5 Bulkhead Area

This area includes an approximate 1,200-foot portion of the bulkhead adjacent to the Jamaica Bay. According to Sanborn Maps, historic photographs, and historic construction documents, a coal hopper and a hoisting engine used to offload barges were located in this area. In addition, a concrete tunnel used to transport coal, and later as a pipe gallery, extended from the former gas works area under Beach Channel Drive to the coal hopper. The bulkhead was constructed while the plant was in operation and historical photographs indicate that landfilling occurred in this area. The physical observations of contamination in subsurface soils indicate the presence of lenses of tar-saturated material in one area of the bulkhead. This area is located in the vicinity of the concrete tunnel and the coal hopper. Lenses of tar-saturated medium to coarse sands and shell-baring layers were observed from approximately 19 feet bgs to 66 feet bgs at boring RPMW-02D2. The most extensive area of lenses of tar-saturated material was observed in the 42 to 55 feet bgs interval at borings RPMW-02D2 and RPSB-116, as depicted on Plate 15. This area extends from the skimming basin located in the former gas works area. Soil staining and MGP-related odors were observed in several borings located in the center of the bulkhead area. Organic odors, with no associated visual contamination, were observed in several borings that appear to relate to marine biodegradation processes.

In addition to these findings, the NYSDEC requested that an IRM be implemented to address shallow soils located between Beach Channel Drive and the bulkhead. These activities are underway and the findings will be reported in a supplemental report.

Tables 4-20 to 4-24 present the analytical results of samples collected in this area.

Concentrations of TPAHs in subsurface soils from 0 to 12 feet bgs in this area ranged from non-detect in several samples to 1,258.2 mg/kg in sample RPSB-114 (4 to 6 feet bgs). CPAH ranged from non-detect in several samples to 216.3 mg/kg in sample RPSB-114 (4 to

6 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 0.532 mg/kg in sample RPSB-83 (9 to 11 feet bgs). Total cyanide ranged from non-detect in several samples to 6.5 mg/kg in sample RPSB-113 (0 to 2 feet bgs). Concentrations of TPAHs in subsurface soils from 12 to 24 feet bgs in this area ranged from non-detect in sample RPSB-02 (20 to 22 feet bgs) to 20.651 mg/kg in sample RPMW-02D2. CPAH ranged from non-detect in samples RPSB-02 (20 to 22 feet bgs) and RPSB-86 (21 to 22 feet bgs) to 2.58 mg/kg in sample RPSB-87 (21 to 23 feet bgs). Concentrations of BTEX in subsurface soils ranged from 0.002 mg/kg in sample RPBB-02 to 0.547 mg/kg in sample RPSB-130 (22 to 24 feet bgs). Total cyanide was not detected in any of the samples from this interval.

Concentrations of TPAHs in subsurface soils from 24 to 45 feet bgs in this area ranged from non-detect in several samples to 2,130.5 mg/kg in sample RPSB-85 (24 to 25 feet bgs). CPAH ranged from non-detect in several samples to 177.5 mg/kg in sample RPSB-85 (24 to 25 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in samples RPSB-87 (37 to 39 feet bgs) and RPSB-87A (38 to 40 feet bgs) to 79 mg/kg in sample RPSB-85 (24 to 25 feet bgs). Total cyanide ranged from non-detect in several samples to 4.6 mg/kg in sample RPSB-02A (30 to 32 feet bgs).

Concentrations of TPAHs in subsurface soils from 45 to 90 feet bgs in this area ranged from non-detect in several samples to 2,103 mg/kg in sample RPMW-02D2 (62 to 66 feet bgs). CPAH ranged from non-detect in several samples to 263 mg/kg in sample RPMW-02D2 (62 to 66 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 13.8 mg/kg in sample RPMW-02D2 (62 to 66 feet bgs). Total cyanide ranged from non-detect in several samples to 0.52 mg/kg in sample RPSB-116 (54 to 56 feet bgs).

Two samples, RPMW-02D2 and RPSB-130 were collected from subsurface soils greater than 90 feet bgs in this area. TPAHs and BTEX were detected in sample RPMW-02D2 (97 to 107 feet bgs) at concentrations of 0.154 mg/kg and 0.005 mg/kg, respectively. Neither sample contained detectable concentrations of CPAHs or total cyanide.

4.1.6 South and West Adjacent Areas

The south and west adjacent areas are identified as the portion of Rockaway Freeway from boring RPSB-76 north to the intersection of Rockaway Freeway and Beach Channel Drive. According to Sanborn Maps and historical photographs, no former MGP structures were located in this area. During the installation of the feeder cable, evidence of purifier material was observed in this area. The physical observations indicated that staining and odors were encountered in 2- to 8-foot-thick layers primarily in the 0- to 12-foot interval. These observations were obtained from borings RPSB-56, RPSB-76, RPSB-75, RPSB-74, and

RPSB-73, and the staining and odors were encountered at depths ranging from 4 to 12 feet bgs. Observations obtained from boring RPGP-28A at the 0- to 12-foot interval indicated purifier odors at depth intervals from 1.2 to 15 feet bgs and a fuel odor from 16.6 to 22.9 feet bgs. At the 12- to 24-foot interval, observations obtained from boring RPGP-28A indicate a purifier odor at 36 to 36.5 feet bgs and a fuel oil odor at 33.5 to 34.5 feet bgs. No odors or staining were observed in borings located near the intersection of Rockaway Freeway and Beach Channel Drive.

Tables 4-25 to 4-27 present the analytical results of samples collected in this area.

Concentrations of TPAHs in subsurface soils from 0 to 12 feet bgs in this area ranged from non-detect in several samples to 408.4 mg/kg in sample RPSB-56 (5 to 7 feet bgs). CPAH ranged from non-detect in several samples to 137.2 mg/kg in sample RPSB-56 (5 to 7 feet bgs). Concentrations of BTEX in subsurface soils were detected in only one sample in this interval, RPGP-28A (4 to 8 feet bgs) at 0.007 mg/kg. Total cyanide ranged from non-detect in sample RPSB-106 to 3.4 mg/kg in sample RPSB-76.

Concentrations of TPAHs, CPAHs, and BTEX were not detected in the two subsurface-soil samples from the 12- to 24-foot bgs interval in this area. Total cyanide was detected at 0.26 mg/kg in sample RPSB-73 (12 to 14 feet bgs).

Concentrations of TPAHs, CPAHs, and BTEX were not detected in the subsurface-soil samples from the 24- to 45-foot bgs interval in this area. Total cyanide was detected and ranged from non-detect in sample RPSB-55 (40 to 42 feet bgs) to 0.27 mg/kg in sample RPSB-56 (40 to 42 feet bgs).

4.1.7 South and East Adjacent Areas

The south and east adjacent areas are identified as the portion of Rockaway Freeway from boring RPSB-76 to the intersection of Rockaway Freeway and Beach 108th Street. The area also includes Beach 108th Street between the intersection of Rockaway Freeway and Beach Channel Drive. The physical observations obtained from borings located along Rockaway Freeway indicated that staining and odors were encountered in the 0- to 12-foot interval. The odors and staining were encountered in the borings between 4 and 15 feet bgs and ranged in thickness from 4 to 8 feet. No odors or staining were observed in these borings at deeper intervals. Odors were also observed in boring RPSB-102 at 23 to 25 feet bgs. No odors or staining were observed in this boring below 25 feet bgs.

The physical observations obtained from borings located along Beach 108th Street and borings RPGP-25 and RPGP-26 located near the intersection of Beach 108th Street and Rockaway Freeway indicate that staining and odors in the 0- to 12-foot interval were limited

in extent. Staining was only encountered in boring RPSB-98, located east of the drip tank area, at 8 to 12 feet bgs. Sewer-like odors were observed in several of the borings at the 0- to 12-foot interval and were likely emanating from the sewer treatment plant located east of Beach 108th Street. Naphthalene-like odors were observed in boring RPSB-63 located in the northern portion of Beach 108th Street at 15 to 17 feet bgs. Physical observations obtained from the 12- to 24- and 24- to 45-foot intervals indicate sewer-like odors. Naphthalene-like odors were encountered in boring RPSB-63 at 30 to 32 feet bgs and 35 to 36 feet bgs.

Tables 4-28 to 4-31 present the analytical results of samples collected in this area.

Concentrations of TPAHs in subsurface soils from 0 to 12 feet bgs in this area ranged from non-detect in several samples to 88.7 mg/kg in RPSB-61 (10 to 12 feet bgs). CPAH ranged from non-detect in several samples to 35.83 mg/kg in sample RPSB-79 (10 to 12 feet bgs). Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 2,790 mg/kg in sample RPSB-61 (10 to 12 feet bgs). Total cyanide ranged from non-detect in several samples to 5.1 mg/kg in sample RPSB-81 (6 to 8 feet bgs).

Concentrations of TPAHs in subsurface soils from 12 to 24 feet bgs in this area ranged from non-detect in several samples to 0.375 mg/kg in sample RPSB-60 (15 to 17 feet bgs). CPAHs were not detected in samples collected in this interval. Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 0.384 mg/kg in sample RPSB-127 (21 to 23 feet bgs). Total cyanide ranged from non-detect in several samples to 0.80 mg/kg in sample RPSB-101 (15 to 17 feet bgs).

Concentrations of TPAHs in subsurface soils from 24 to 45 feet bgs in this area ranged from non-detect in several samples to 1.155 mg/kg in sample RPSB-58 (40 to 42 feet bgs). CPAHs were detected in one sample in this interval, RPSB-58 (40 to 42 feet bgs) at 0.123 mg/kg. Concentrations of BTEX in subsurface soils ranged from non-detect in several samples to 0.015 mg/kg in sample RPSB-60 (40 to 42 feet bgs). Total cyanide ranged from non-detect in several samples to 3.3 mg/kg in sample RPSB-99 (38 to 40 feet bgs).

Concentrations of TPAHs in subsurface soils from 45 to 90 feet bgs in this area were only detected at one sample in this interval, RPSB-61 (55 to 57 feet bgs) at 0.066 mg/kg. CPAHs and total cyanide were not detected in any samples in this interval. Concentrations of BTEX in subsurface soils ranged from non-detect in sample RPSB-63 (45 to 47 feet bgs) to 0.008 mg/kg in sample RPSB-61 (55 to 57 feet bgs).

4.2 Surface-Soil Analytical Results

The collected surface-soil samples consisted of brown to black sand with organic matter. Physical observations indicate that no odors or staining were observed in the samples. A total of 25 surface-soil samples have been collected at the site from 1997 to 2002. Refer to Plate 1 for the surface soil sample locations. The analytical results indicate that BTEX, PAHs, metals, and cyanide were detected in the samples. Samples RPSS-18, RPSS-19, and RPSS-20 were collected in September 2002 for PCBs in the former electric substation area. The analytical results indicated that PCBs were not detected in these samples.

The laboratory analytical results indicated that BTEX compounds were all detected at concentrations below the RSCOs. The highest concentration of BTEX was detected in sample SS-08B at 0.041 mg/kg. This sample was located in the western-central portion of the site.

The laboratory analytical results indicated that PAH compounds were detected in all the surface-soil samples collected at the site. The highest concentration of PAHs was detected in sample RPSS-10 at 185.59 mg/kg. This sample was located in the former oxide enclosure. Several of the samples contained PAH compounds above the RSCOs. Specific analytes exceeding the RSCOs are highlighted on Tables 4-32 to 4-36. The results on these tables are organized by area of the site.

The laboratory analytical results indicated that metals were detected in all the surface soil samples and the concentrations were generally within typical background concentrations in the Eastern United States (Shacklette and Boerngen, 1984). Cyanide concentrations were detected at concentrations ranging from 0.13 mg/kg to 9.4 mg/kg for the samples collected in 2002. The samples collected in 1997 were generally consistent with the 2002 samples except for a cyanide concentration of 324 mg/kg in RPSS05. This sample was collected from the former oxide enclosure.

Tables 4-32 to 4-36 present the analytical results of surface-soil samples collected in each area.

4.2.1 Former Gas Works Area

Concentrations of TPAHs in surface soils ranged from 1.165 mg/kg in sample SS-01B to 559.1 mg/kg in sample SS-01C. CPAH ranged from 0.544 mg/kg in sample SS-01B to 263 mg/kg in sample SS-02A. Concentrations of BTEX in surface soils ranged from non-detect in several samples to 0.041 mg/kg in sample SS-08B. Total cyanide ranged from 0.13B mg/kg in sample RPSS-05 to 23.0 mg/kg in sample SS-08B.

4.2.2 Former Electric Substation Area

Concentrations of TPAHs in surface soils ranged from 9.808 mg/kg in sample SS-04C to 960.6 mg/kg in sample SS-08C. CPAH ranged from 2.84 mg/kg in sample SS-04C to 320.1 mg/kg in sample SS-08C. Concentrations of BTEX in surface soils ranged from non-detect in sample SS-04A and SS-04C to 0.05 mg/kg in sample SS-02B. Total cyanide ranged from 6.1 mg/kg in sample SS-04C to 764 mg/kg in sample SS-09C. PCB concentrations were not detected in surface-soil samples SS-17, SS-18, and SS-19 collected during the Final RI investigation.

4.2.3 Former 2-Million Cubic-Foot Holder & Drip Tank Area

Concentrations of TPAHs in surface soils ranged from 13.5 mg/kg in sample SS-03A to 398.3 mg/kg in sample SS-05B. CPAH ranged from 7.5 mg/kg in sample SS-03A to 189 mg/kg in sample SS-05B. Concentrations of BTEX in surface soils ranged from non-detect in several samples to 0.021 mg/kg in sample SS-05B. Total cyanide ranged from 0.26B mg/kg in sample RPSS-15 to 324 mg/kg in sample SS-05B.

4.2.4 Current Electric Substation Area

Concentrations of TPAHs in surface soils ranged from 1.586 mg/kg in sample SS-09B to 83.74 mg/kg in sample RPSS-04. CPAH ranged from 0.774 mg/kg in sample SS-09B to 36.4 mg/kg in sample RPSS-04. Concentrations of BTEX in surface soils ranged from non-detect in sample RPSS-04 to 0.016 mg/kg in sample SS-09B. Total cyanide ranged from 1.43 mg/kg in sample SS-09B to 10.4 mg/kg in sample RPSB-14.

4.2.5 Bulkhead Area

Concentrations of TPAHs in surface soils ranged from non-detect in several samples to 91.02 mg/kg in sample RPSS-21. CPAH ranged from non-detect in sample RPSS-03 to 27.38 mg/kg in sample RPSS-21. Concentrations of BTEX in surface soils ranged from non-detect in several samples to 0.019 mg/kg in sample RPSS-20. Total cyanide ranged from 0.15B mg/kg in sample RPSS-01 to 21.3 mg/kg in sample RPSS-17.

In addition to these findings, the NYSDEC requested that an IRM be implemented to address shallow soils located between Beach Channel Drive and the bulkhead. These activities are underway and the findings will be reported in a supplemental report.

4.3 NAPL

Measurable DNAPL was observed at the site in two well clusters, RPMW-07 and RPMW-09, and in piezometer PZ-08 located near RPMW-09. Well cluster RPMW-07 was located near the former skimming basin and well cluster RPMW-09 was located near the former tar separator. DNAPL was detected in RPMW-07I and RPMW-07D at thicknesses of 2.8 feet and 3.9 feet, respectively, on September 16, 2002. However, DNAPL was not detected in the shallow well RPMW-07S and the deepest well RPMW-07D2. Physical observations indicate the DNAPL was black and emitted a strong tar-like odor in wells RPMW-07I and RPMW-07D. Boring descriptions indicated discontinuous tar-saturated coarse sand lenses in these intervals. The location of well cluster RPMW-07 indicates that the skimming basin area is a potential source of DNAPL for the wells RPMW-07I and RPMW-07D.

Measurable DNAPL was detected in monitoring wells RPMW-09I, RPMW-09D, and RPMW-09D2 at thicknesses of 0.5 foot, 5.7 feet, and 5.5 feet on September 16, 2002. DNAPL was detected at a thickness of 0.1 foot in PZ-08. These wells were located near the former tar separator and former holders in the former gas works area. Physical observations indicate that the DNAPL in the RPMW-09 cluster and PZ-08 was black, had a "shiny appearance," and emitted a strong tar-like odor. The DNAPL observed in RPMW-09I also emitted a diesel-like odor. Boring descriptions indicate that discontinuous tar-saturated coarse sand layers and lenses were observed in these intervals. The location of well cluster RPMW-09 and PZ-08 indicates that the former tar separator and holders in this area are a potential source of DNAPL in wells RPMW-09I, RPMW-09D, and RPMW-09D2.

Measurable LNAPL was observed in shallow water table wells RPMW-11S and PZ-08 on September 16, 2002, and in PZ-05 on November 30, 2001 at thicknesses of 0.10 foot, 0.36 foot, and 0.16 foot. LNAPL was also observed in PZ-08 at a thickness of 0.25 foot on November 30, 2001. RPMW-11S is located in Beach Channel Drive, north of the three-story building located in the former gas works area. PZ-08 is located near the former tar separator and PZ-05 is located near the former engine room in the former gas works area. Physical observations indicate that the LNAPL observed in RPMW-11S had a brown caramel color, was highly weathered and emulsified, and emitted a strong fuel oil-like odor. Physical observations obtained from well PZ-08 indicate that the LNAPL emitted a fuel oil-like odor and had a brown caramel color. No physical observations of the LNAPL in PZ-05 were recorded during the November 2001 sampling event. LNAPL observed in RPMW-11S could potentially be from residual fuel oil contamination remaining in the soil due to historic releases to soil. The locations of PZ-08 and PZ-05 indicate that the source of the observed LNAPL could be the result of fuel oil contamination resulting from releases near the tar separator and engine room areas.

4.4 Groundwater Analytical Results

The groundwater analytical data were divided into the following intervals: Shallow, 0 to 17 feet bgs; Intermediate 17 to 45 feet bgs; Deep 45 to 90 feet bgs; and Deep (2), greater than 90 feet bgs. All available groundwater analytical data from the RI and previous investigations are summarized in Tables 4-37 through 4-40. Appendix E includes the chain-of-custody forms and data validation reports from the Final RI investigation. A summary of TPAH, CPAH, BTEX, and cyanide results from the September 2002 Final RI sampling event is presented on the shallow, intermediate, deep, and deep (2) groundwater contour plates at low tide (Plates 3, 5, 6, and 7). The September 2002 sampling round conducted for the Final RI included all previously existing and newly installed wells. Therefore it is the most comprehensive sampling round to date and the following discussion focuses on the September 2002 round. Previous sampling rounds are referenced to discuss any significant upward or downward concentration trends.

4.4.1 Shallow Groundwater

The groundwater analytical results indicate that the groundwater samples with the highest concentration of compounds of potential concern were obtained from wells generally located in the former gas works, former electric substation, and the former 2-million cubic-foot holder area. Elevated concentrations of BTEX were detected in shallow groundwater from the southeast corner of the former 2-million cubic-foot holder area extending across Beach 108th Street to the northeast. Refer to Table 4-37 for a shallow groundwater analytical summary. Refer to Plate 3 for the analytical summaries on the groundwater contour map for low tide.

Concentrations of total BTEX in shallow groundwater ranged from 0 ug/L in several wells to 116,400 ug/L in monitoring well RPMW-10S. The previous sampling round indicated a concentration of 22,390 ug/L in this well. TPAH concentration ranged from 0 ug/L in several monitoring wells to 8,871 ug/L in well PZ-02. CPAHs were not detected in samples collected from the shallow monitoring wells in September 2002. However, the groundwater analytical results indicate elevated detection limits on many of the groundwater results due to high concentrations of TPAHs in the samples. Previous sampling rounds contained CPAHs as high as 920 ug/L in well PZ-01. Cyanide concentrations ranged from 0 mg/L in several monitoring wells to 4.67 mg/L in RPGP-28A.

4.4.2 Intermediate Groundwater

The groundwater analytical results indicate that the groundwater samples with the highest concentration of compounds of potential concern were obtained from wells generally located in the central to northern portion of the former gas works and in well MW-02I, located near

the bulkhead area on Beach Channel Drive. Refer to Table 4-38 for an intermediate groundwater analytical summary. Refer to Plate 5 for the analytical summaries on the groundwater contour map for low tide.

Concentrations of total BTEX in intermediate groundwater ranged from 0 ug/L in several wells to 7,820 ug/L in monitoring well RPMW-02I. TPAH concentration ranged from 0 ug/L in several monitoring wells to 12,400 ug/L in well RPMW-02I. Several of the monitoring wells with nondetectable concentrations of TPAH were located in the southern portion of the site, Rockaway Freeway, and Beach 108th Street. CPAH concentrations were not detected in the monitoring wells except for well RPMW-07I at a concentration of 1 ug/L. However, the groundwater analytical results indicate elevated detection limits on many of the groundwater results due to high concentrations of TPAHs in the samples. Cyanide concentrations ranged from 0 mg/L in several monitoring wells to 0.2 mg/L in RPMW-03I.

4.4.3 Deep Groundwater

The groundwater analytical results indicate that the groundwater samples with the highest concentration of compounds of potential concern were obtained from wells generally located in the former gas works area. The groundwater sample obtained from monitoring well RPMW-09D located in the former gas works area contained total BTEX and TPAH concentrations an order of magnitude greater than the concentrations detected in other samples. Refer to Table 4-39 for a deep groundwater analytical summary. Refer to Plate 6 for the analytical summaries on the groundwater contour map for low tide.

Concentrations of Total BTEX in deep groundwater ranged from 0 ug/L in several wells to 14,340 ug/L in monitoring well RPMW-09D. TPAH concentrations ranged from 0 ug/L in several monitoring wells to 5,090 ug/L in well RPMW-09D. Several of the monitoring wells with nondetectable concentrations of TPAH were located in the southern portion of the site, Rockaway Freeway, and Beach 108th Street. CPAH concentrations were not detected in the monitoring wells. Cyanide concentrations ranged from 0 mg/L in several monitoring wells to 0.007 mg/L in RPMW-12D.

4.4.4 Deep (2) Groundwater

The groundwater analytical results indicate that the groundwater samples with the highest concentration of compounds of potential concern were obtained from well RPMW-09D2, located in the former gas works area. The groundwater sample obtained from monitoring well RPMW-09D2, located in the former gas works area, contained total BTEX and TPAH concentrations an order of magnitude greater than the concentrations detected in other samples. No total BTEX and TPAH concentrations were detected in monitoring wells RPMW-02D2 and RPMW-08D2. Refer to Table 4-40 for a deep (2) groundwater analytical

summary. Refer to Plate 7 for the analytical summaries on the groundwater contour map for low tide.

Concentrations of total BTEX in deep (2) groundwater were not detected in monitoring wells RPMW-02D2, RPMW-08D2, RPMW-12D2, and RPMW-14D2. Total BTEX was detected in wells RPMW-07D2, RPMW-09D2, and RPMW-13D2 at concentrations of 7 ug/L, 20,600 ug/L, and 377 ug/L, respectively. TPAH concentrations ranged from 0 ug/L in wells RPMW-02D2 and RPMW-08D2 to 7,290 ug/L in RPMW-09D2. CPAH concentrations were not detected in the monitoring wells. Cyanide was only detected in monitoring well RPMW-12D2 at a concentration of 0.0063 mg/L.

4.5 Jamaica Bay Sediment

All available sediment analytical data from the Final RI investigation is summarized in Table 4-41. Appendix F includes the validated laboratory Form I reports for the sediment data. The sediment sampling locations are presented on Plate 2. The objective of the sampling was to evaluate shallow sediment quality adjacent to the site. Following their review of the data presented below, the NYSDEC requested that a supplemental sediment investigation be performed to refine the understanding of sediment impacts. This supplemental sediment investigation includes collection of deeper sediment samples surrounding the area of impacts discussed below. The results will be reported in a supplemental report.

Surficial sediment samples were collected from the top 0.3-foot interval at all 17 sediment locations. Physical observations indicate that the majority of the samples consisted of black natural organic matter and fine sand.

Deeper sediment samples were collected from 0.30 to 3 feet bgs at all the locations except for RPSED02-6. The physical observations indicate that the majority of the samples consisted of black fine sand changing to a gray fine sand. The deeper samples at RPSED02-6 were collected at 0.30 to 1.9 feet bgs, 1.9 to 2.4 feet bgs, and 2.4 to 4 feet bgs. The additional samples at RPSED02-6 were obtained to evaluate sheens and odors observed in the 2.1-foot and 2.5-foot bgs interval.

The laboratory analytical results indicate that the sample with highest total BTEX and PAH concentrations, 120.6 mg/kg and 321.8 mg/kg, respectively, was obtained from RPSED02-6 (1.9 to 2.4 feet).

For the RPSED02-6 sample, the total BTEX and PAH concentrations decreased to 0.19 mg/kg and 1.47 mg/kg, respectively, in the deeper 2.4- to 4.4-foot sample. The samples obtained from the 0.30- to 1.9-foot interval indicate concentrations of total BTEX and PAHs

of 36.65 mg/kg and 60.35 mg/kg, respectively. The surficial sample obtained from 0.0 to 0.30 feet indicate total BTEX and PAH concentrations of 6.95 mg/kg and 18.11 mg/kg, respectively. In summary, sediment sample concentrations of total BTEX and PAH compounds decrease in samples obtained above and below the 1.9- to 2.4-foot interval. Similarly, the detected concentrations are greatest in the 0.3- to 3-foot interval in samples collected at locations RPSED02-3, RPSED02-7, and RPSED02-9. The detected concentrations are greatest in the surficial samples, 0.0 to 0.30 foot, and decrease with depth at locations RPSED02-1, RPSED02-2, RPSED02-4, RPSED02-5, RPSED02-8.

The laboratory analytical results indicate that background surficial samples (RPSEDBG-A through RPSEDBG-H) generally contained total PAH compounds at concentrations less than the samples obtained at locations RPSED02-1 through RPSED02-9. Table 4-42 presents a summary of the total PAHs, as well as total carcinogenic and non-carcinogenic PAHs for each sediment sample. As previously discussed, one sediment sample (RPSED02-6) contained a sheen and odor indicative of MGP tar. Table 4-42 presents the average total PAH concentrations for the background surficial sediments, as well as the vibracore sediment samples RPSED02-1 through RPSED02-9. The average total PAH concentrations were also calculated for the vibracore sediment samples, excluding the results from RPSED02-6.

The average total PAH concentration for the background surficial samples (RPSEDBG-A through RPSEDBG-H) was 1.83 mg/kg, while the average for the vibracore samples from RPSED02-1 through RPSED02-9 was 27.42 mg/kg. Excluding the results from RPSED02-6, the total PAH average for the vibracore samples was 6.87 mg/kg. These results indicate that the vibracore samples collected nearer the site generally contain higher concentrations of total PAHs than those collected further from the site. Plate 16 depicts the lateral and vertical distribution of total PAH concentrations for the sediment samples. As shown by Plate 16, elevated PAH concentrations are found in sediments nearest the site and centered around RPSED02-6, and constitute a small area located approximately 150 feet offshore of the bulkhead along the frontage of the site.

The analysis of the background sediments demonstrates that PAHs unrelated to the site are present pervasively throughout the Beach Channel portion of Jamaica Bay. The background PAH concentrations detected (average 1.83 mg/kg) are generally consistent with information available for this reach of Jamaica Bay. Brookhaven National Laboratory (BNL) manages the Water Resources Development Act (WRDA) New York/New Jersey Harbor Sediment Decontamination Project. As part of this project, BNL has developed a series of graphics depicting the distribution of contaminants in sediments within New York Harbor and associated estuaries. The BNL map of Surficial Total PAH sediment concentration for Jamaica Bay depicts total PAH sediment concentrations lower than 2 mg/kg at the location of the Rockaway Park former MGP site (Source: http://www.bnl.gov/wrdadcon/publications/image/jamaica-bay-pah.jpg).

Subsection 6.4 presents an ecological risk analysis of the sediment findings.

4.6 Summary of Contaminant Distribution

The physical and chemical distribution of contaminants at the Rockaway Park former MGP site suggests the presence of four separate source areas of tar-saturated material in the subsurface. The four source areas described in the preceding sections are in the vicinity of the former tar separators and holders in the Former Gas Works Area; the vicinity of the former skimming basin in the Former Gas Works Area; the depositional tar-saturated material in the Former Electric Substation Area; and the former drip tanks located in the Former 2-Million Cubic-Foot Holder and Drip Tank Area. These source areas are defined by significant zones of tar saturation and the presence of DNAPL and LNAPL, which coincide with the highest concentrations of PAHs and BTEX recorded in the subsurface and groundwater.

The distribution of physical impacts in the subsurface present four separate source areas. Cross Sections A-A' and B-B' (Plate 13) were located to evaluate the potential migration of tar between the drip tank area and depositional tar-saturated materials and between the holders/tar separator area and the skimming basin area. In addition, cross sections C-C' and D-D' (Plate 14) were located to identify potential tar migration pathways between the drip tank area and the holders/tar separator area and between the depositional tar-saturated materials and the skimming basin area. While there is some evidence of connectivity between the depositional tar-saturated materials and the skimming basin area from 0 to 24 feet bgs, the cross sections show primarily limited impacts to include minor lens, sheens and MGP-related odors, but no significant migration pathway between the source areas.

In general, it appears that the three factors may have combined to retard the migration of subsurface tar and dissolved phase impacts. These factors include the subhorizontal bedding plains of shell-baring layers and coarser sands; the significant tidal influence in groundwater at the site, and subsurface structures, specifically the former and current bulkheads.

The subhorizontal bedding plains of shell-baring layers and coarser sands have provided a preferential pathway for the migration of subsurface tar. However, the relative thickness of these bedding plains, from 3 feet to less than 1 inch, provide a limited volume of pore space. Although the bedding planes exist in all intervals, they are not continuous between the northern and southern portions of the site. The original circa 1912 bulkhead bisected the site, separating the drip tank area and the holders/tar separator area from the northern portions of the site. Therefore, the shell-baring layers identified in the drip tank and holders/tar separator areas would intersect the original bulkhead and not be continuous with those identified to the north of the former bulkhead. Although the former bulkhead does not appear to have any

hydraulic influence over the site, as a physical barrier it did have some influence on retarding the migration of shallow subsurface tar by cutting off these preferential pathways. The shell-baring bedding planes are likely continuous below this barrier. However, the majority of volume of subsurface tar in the top 45 feet of soil appears to have reached a near steady-state condition. Given that, it is likely that any potential further migration of subsurface tar will be driven by gravity. Further lateral migration is unlikely from this area.

The current bulkhead has had a similar effect on the areas between the circa 1912 bulkhead and the current bulkhead. The tar impacts within the depositional tar-saturated materials and the skimming basin area have migrated along similar preferential pathways within the shallow fill material, and the hydraulic fill. However, where lateral migration appears to have stopped in the southern portion of the site, limited migration through the shell-baring layers has resulted in lenses of tar-saturated material extending from the location of the former skimming basin to the current bulkhead. Cross sections B-B' and E-E' (Plates 13 and 15) intersect this migration axis and the bulkhead. Significant tar lenses were intercepted in borings RPMW-02D2, RPSB-116 and RPSB-84 along this likely migration pathway. Along the remainder of the bulkhead, impacts were limited to odors only, suggesting that the pathway is narrow as depicted on Plates 9, 10, and 11.

The significant tidal influence on site groundwater has had a significant effect on limiting the migration of dissolved phase impacts off site. The inversion that occurs at high tide creates an ebb and flow of groundwater over the impacted areas and limits the migration of dissolved phase impacts off site. This effect decreases with depth and has a limited effect on the deep (2) groundwater zone.

5. Fate And Transport

This section provides an analysis and discussion of the data presented in previous sections to provide an interpretation of the interaction between the physical and chemical processes that characterize the impacts at the Rockaway former MGP site. Through an understanding of sources, migration pathways, and potential receptors, the need for remedial actions to protect human health and the environment can be evaluated.

The following analysis takes into account the physical characteristics and surroundings of the site, the groundwater hydrology, the site geology, the site history, the nature of the chemical compounds encountered during the sampling and analysis programs, and any apparent trends in the distribution of these materials on or adjacent to the site. This section provides a discussion of the physical, chemical, and biological characteristics of compounds of concern (COCs), and a discussion of the sources, migration pathways, and receptors for those COCs associated with the site. COCs are defined as those constituents that are present within each media at concentrations exceeding the applicable standards and generally include BTEX, PAHs, and cyanide.

The environmental media that may serve as pathways for COC migration are DNAPL, surface soil, subsurface soil, groundwater, and Jamaica Bay sediments.

5.1 DNAPL and LNAPL

For the purpose of this discussion, DNAPL is defined as the visual observation of tar-saturated material or soil containing tar blebs or tar lenses (residual DNAPL). The chemical constituents addressed that are in DNAPL include BTEX and PAHs. DNAPL was observed in several borings and in two monitoring well clusters (RPMW-07, RPMW-09) on site. Plate 2 illustrates the locations at which DNAPL was encountered. The DNAPL at the site does not appear to be present in a continuous phase; rather it is present in intermittent lenses and layers of pervious material. DNAPL was observed in deep subsurface soils and groundwater. DNAPL impacts generally decreased with depth due to solubilization and/or immobilization processes.

It appears that releases of DNAPL from the MGP area generally migrated downward through the permeable fill and sandy Barrier Island Deposits. DNAPL impacts were observed to be greatest near or adjacent to the source areas at the site. Therefore, the major migratory pathway for DNAPL is vertical migration through the subsurface soil. The extents of DNAPL impacts are shown in cross sections on Plates 13, 14, and 15. DNAPL migration

continued downward in the source areas until it encountered coarse sand layers. Some DNAPL would then laterally migrate as stringers or bands in these layers. DNAPL impacts were observed in the well cluster RPMW-02 on Beach Channel Drive due to DNAPL migration through these deep subsurface-soils layers from source areas on site.

Measurable LNAPL was also observed in monitoring wells PZ-05, PZ-08, and RPMW-11S at the site. These wells are located in the former gas works area and in Beach Channel Drive. LNAPL will migrate vertically through soils until it encounters the groundwater and will then migrate laterally. The LNAPL is most likely present due to residual NAPL being released from soil in these areas.

5.2 Surface Soil

PAHs, cyanide, and metals were identified as COCs in surface soil. These COCs were detected throughout the site with higher concentrations in the vicinity of some of the former MGP structures. The surface of the site is primarily grass covered, with some areas covered by gravel, asphalt, structures, and sparsely vegetated areas.

These COCs could potentially migrate via volatilization, fugitive dust emissions, and dissolution into surface water. Each of these pathways and its potential to occur at the site are described as follows.

- **Volatilization.** Describes the movement of a chemical from the surface of a liquid or solid matrix to a gas or vapor phase. PAHs and inorganics do not readily volatilize, therefore volatilization is not a likely pathway for migration.

- **Fugitive Dust.** COCs sorbed to soil particulates could be transported as fugitive dust if exposed to wind erosion. PAHs exhibit varying degrees of binding affinity to organic matter and soil particles; this affinity is partly dependent upon their individual molecular structures. The soils at the site are typically sands, which have relatively low total organic carbon (TOC) content. The low TOC content will generally reduce the potential for sorption of COCs to the soils. In general, the higher molecular weight PAHs (e.g., benzo(a)pyrene) are strongly sorbed, whereas the lighter PAHs (e.g., naphthalene) are less strongly sorbed (EPA, 1979; EPA, 1986). Therefore, the higher molecular weight PAHs are expected to remain sorbed to soils, while the lighter-end PAHs may be desorbed and transported by other mechanisms. Inorganics also generally exhibit an affinity to particulates. The poorly vegetated areas of the site may be prone to transport of surface soils via fugitive dust emissions.

- **Solubility.** This is the measure of a chemical's ability to dissolve in water. COCs sorbed to soil may dissolve in water as surface water, which then infiltrates into the

ground or runs off the site. PAHs have a varying degree of solubility. The lighter-end PAHs are more soluble while the heavier-end PAHs are less soluble and typically do not dissolve into water. Cyanide typically present at MGP sites is in the form of ferric ferrocyanide, or Prussian Blue. Ferric ferrocyanide is relatively insoluble in normal to low pH conditions. Given the nature of the compounds in the surface soil, dissolution of compounds in surface water is likely not a major migration pathway.

Migration of COCs from the surface soil is possible at the site, but primarily through the transport of particulates. The nature of the COCs is such that they are relatively persistent in soils and would likely remain attached to soil particulates.

5.3 Subsurface Soil

BTEX, PAHs, and metals were identified as COCs in subsurface soil. In general, the distribution of BTEX and PAHs in soil coincides with the presence of DNAPL. Section 4 discusses the extent of COCs (BTEX and PAHs) associated with the presence of DNAPL.

The COCs could potentially migrate through the subsurface soil by volatilization, sorption, and solubility. Each migration pathway, as it relates to the COCs identified in subsurface soil at the site, is discussed below.

- **Volatilization**. BTEX constituents are highly volatile and therefore may be transported from subsurface soils and groundwater to soil gas in the vadose zone and then into ambient air. PAHs and metals do not readily volatilize. Total BTEX concentrations in soil vapor samples collected at the site did not exceed 470 parts per billion volume (ppbv) (Table 5-1). Naphthalene was not detected in any soil vapor gas samples collected off site. In addition, the ambient air sample collected within the three-story building indicated low concentrations of xylenes and toluene ranging from 1.3 to 3.8 ppbv. Therefore, the volatilization of BTEX compounds does not appear to be a major pathway at the site and the compounds are at detected concentrations that would not affect indoor air quality.

- **Sorption**. This is usually defined as the reversible binding of a chemical to a solid matrix. However, there is evidence in the published literature that there is a partially irreversible component related to the time that the compound has been sorbed. Sorption of BTEX, PAHs, and metals limits the fraction available for other fate processes such as volatilization and/or solubility. In general, BTEX compounds have low sorption potential, coupled with high water solubility and high volatility, which make sorption a relatively minor environmental fate process for BTEX compared to other mechanisms. PAHs exhibit varying degrees of binding affinity to organic matter and soil particles; this affinity is dependent upon their individual molecular structures

and the TOC content of the soil. The soils at the site have a relatively low TOC content, which can reduce the potential for PAHs to sorb to the soil. In general, the higher molecular weight PAHs (e.g., benzo(a)pyrene) are strongly sorbed, whereas the lighter PAHs (e.g., naphthalene) are less strongly sorbed (EPA, 1979; EPA, 1986). Therefore, the higher molecular weight PAHs are expected to remain sorbed to soils, while the lighter-end PAHs may be desorbed and transported by other mechanisms. Metals may remain sorbed to the subsurface soils depending on subsurface oxidation-reduction conditions and the availability of anions that the metals could bind with. Metals that do not remain sorbed to subsurface soils could be available for transport through the groundwater system in solution (see below).

- **Solubility**. BTEX has a relatively high solubility. PAHs have varying degrees of solubility. The lighter-end PAHs are more soluble while the heavier-end PAHs are less soluble and typically do not dissolve into groundwater. Since DNAPL was encountered below the water table and BTEX and lighter-end PAHs are COCs in subsurface soil, dissolution of these COCs from soil to groundwater is expected to be a principal migration pathway. Groundwater containing dissolved BTEX and PAHs may discharge to Jamaica Bay and then may be transferred to the surface water in the vicinity of the site. As BTEX containing groundwater discharges to the surface water system, volatilization, biodegradation processes, and dilution will rapidly result in the dissipation of BTEX concentrations, and no impact to Jamaica Bay surface water is anticipated.

  Metals in the subsurface soils could dissolve and continue to leach to the groundwater system. However, the solubility of metals is highly dependent upon the oxidation-reduction conditions of the aquifer, the valance state of the specific metal, and the availability of anions that the metals could bind with to become immobile. Dissolution of metals in the subsurface soils and transport in the dissolved state through the groundwater system is not considered to be a major transport mechanism.

In summary, the presence of DNAPL at the site will likely result in the persistent presence of BTEX in groundwater downgradient of the DNAPL extent. BTEX constituents in subsurface soils not associated with DNAPL are typically mobile and not particularly persistent in the surrounding environment due to their high volatility, low adsorption to soils, and high water solubility. With few exceptions, the PAHs associated with the site will be relatively persistent in the soil matrix and associated with DNAPL. This is primarily due to their generally low water solubility and high sorption to soils. Metals in soil are also anticipated to be relatively persistent.

5.4 Groundwater

BTEX, PAHs, and cyanide have been identified as COCs in groundwater. It should be noted that inorganics were also detected in groundwater at levels exceeding the NYSWQS. However, many of these inorganics are naturally occurring compounds and may be representative of background conditions.

Groundwater impacts are present within source areas identified at the site where DNAPL was observed in monitoring wells (e.g., RPMW-07I/D near the skimming basin, RPMW-09I/D/D2 and PZ-08 near the tar separator). Groundwater impacts were also observed in source areas that contained extensive DNAPL-saturated soils in the former drip oil tank area and a shallow depositional area in the former oxide enclosure and substation. In addition, dissolved phase groundwater COCs (BTEX and light-end PAHs) appear to be migrating from areas where residual DNAPL is present.

From the likely release points within the former source areas, DNAPL likely migrated downward and along coarse sand layers in the Barrier Island Deposits. Refer to Plates 8 through 12 for physically observed tar impacts in soil. This migration appears to have resulted in bands of DNAPL that may act as a continuing source of groundwater contamination. Groundwater generally flows south at high tide and north at low tide. A portion of the groundwater flows to the northeast and northwest due to historic landfilling at and in the vicinity of the site.

As the groundwater flows through the area of residual DNAPL, it will continue to desorb BTEX and light-end PAH compounds, creating a groundwater plume that appears to extend to Rockaway Freeway to the south and the bulkhead area to the north. The low and nondetectable concentrations of dissolved-phase BTEX components in wells on Rockaway Freeway to the west suggest that the leading edge of the plume from the tar-impacted areas extends to the north toward the bulkhead area. In addition, a shallow dissolved phase BTEX groundwater plume extends northeast from the southeast corner of the site. Shallow groundwater concentrations of BTEX along Beach 108th Street are one to two orders of magnitude lower than concentrations of BTEX observed in wells along the eastern boundary of the site. It is anticipated that this dissolved phase BTEX plume migrates northeasterly beneath the WWTP and that the groundwater flow direction eventually shifts to the north with regional groundwater flow toward Jamaica Bay. A supplemental investigation is being performed to evaluate the extent of the northeasterly trending dissolved phase BTEX plume. Results from this investigation will be presented in a supplemental report. Refer to Plates 3, 5, 6, and 7 for BTEX and PAH call-out concentration boxes overlaying the groundwater contours.

The dissolved-phase groundwater COC concentrations within the area of DNAPL impacts are likely in a steady-state condition, where the rate of dilution from inflowing clean water equals the rate of dissolution of COCs from the DNAPL. The likely age of the release (on the order of 40 years) would have allowed the groundwater system on the site to reach steady state. The groundwater plume extends to the well clusters RPMW-11 and RPMW-02, located near the bulkhead area. It is possible that the dissolved phase plume has reached Jamaica Bay; however, if it did, volatilization and dilution would minimize or eliminate any impacts.

Soil gas and ambient air samples obtained at the site and near the three-story building indicate volatilization of BTEX compounds from groundwater to the indoor air does not appear to be a significant pathway of concern.

5.5 Sediment

Sediments from Jamaica Bay may potentially be a transport mechanism at the site because COCs in the sediment could dissolve in water at the sediment interface. Sediment samples were collected at background locations and near the site vicinity from Jamaica Bay. Based on the sediment observations and analytical data collected to date, sediments that are potentially impacted by the dissolved groundwater plume attributed to the site are located in close proximity to the site. Due to tidal and groundwater influences, sediments impacted with PAHs would likely remain close to the site.

6. Qualitative Human Exposure Assessment

6.1 Introduction

This QHEA and FWRIA is part of the RI that is being conducted under an Order on Consent (Index No. D1-0002-98-11) between KeySpan and the NYSDEC concerning the former MGP located in Rockaway Park, Queens County, New York. An evaluation of potential human exposure pathways and risks to the environment is part of the scope of work presented in the final RI/FS Work Plan (D&B, 1999).

This assessment identifies potential human exposures associated with chemical constituents detected in soil, groundwater, and ambient air at or near the Rockaway Park former MGP site. A screening-level ecological assessment in the form of an FWRIA is also included.

This assessment considers potential exposure of humans and biota to chemicals at the site. The specific objectives of the assessment are:

- To identify chemicals of potential concern (COPCs) that are related to the former gas manufacturing activities conducted at the site
- To identify potential pathways of exposure to people, plants, animals, and fish
- To estimate and characterize the potential ecological risks associated with these exposures
- To indicate the need for mitigative measures to reduce potential exposures

This assessment used data collected as a part of D&B's RI (October 2002), and supplemental data collected as part of GEI's Final RI Report (January 2003). It also considered data derived from previous site investigations (GEI, 1999; D&B, 2000). The ecological portion of the assessment is consistent with the NYSDEC's FWRIA guidance (NYSDEC transmittal to KeySpan).

6.1.1 Location and Description

A detailed description of the site is provided in subsection 1.2.1 of this Report. The former MGP site is located in Rockaway Park, Queens County, New York and is listed on the New York State Registry as an inactive hazardous waste site.

An active LIPA electric substation exists adjacent to the northwestern corner of the site. A separate investigation was performed for the area now occupied by the new substation. Results of this investigation are presented in the *Substation Investigation Report and Delisting Petition* report (D&B, 2000). An active natural gas regulator station exists in the southeastern corner of the former MGP site. Two brick buildings (a three-story inactive office building and a one-story workshop) are located along the northern side of the site. A paved driveway extends from the gate on Beach 108th Street to the office building parking area. Former equipment storage areas are located between the workshop and the northeastern corner of the site. These storage areas are infrequently used and covered with gravel. The areas to the south and west of the paved driveway are fenced and covered with sandy soil and/or vegetation. The site is bounded by perimeter fencing and is secure from public access. The main entry gate is electronically controlled and is maintained closed and locked. Secondary entry gates also are locked. The current site plan is provided in Figure 6-1A.

A New York City sewage treatment plant is located to the east of the site. The area immediately south of the site includes the MTA subway tracks and railroad yard followed by a residential area. A commercial area, including an auto service center and retail businesses, is located to the west of the site. North of Beach Channel Drive and along Jamaica Bay is a narrow, approximately 0.6-acre, strip of land. This strip of land, formerly a part of the site, was acquired by the City of New York.

For the purposes of the qualitative human exposure assessment, the site and surrounding property are considered separately with respect to potential exposure to human populations. Current and potential future exposures occurring within the confines of the former MGP site will be referred to hereafter as “on site” exposures. Current and potential future exposures expected to occur outside the confines of the former MGP site, including the bulkhead area, will be referred to as “off site” exposures.

6.1.2 Site History

The Rockaway Park MGP began operations in the late 1870s. Following the arrival of natural gas in the northeastern United States during the early 1950s, the Rockaway Park plant continued operation as a peaking/emergency facility to ensure gas supplies. The plant subsequently shut down in 1957 and was demolished in 1958 by LILCO. A detailed site

history and graphics depicting historical site structures are provided in subsection 1.2.3. Historic site features are depicted in Figure 6-1B.

6.1.3 Site Setting

The physical and environmental setting of the site is provided in subsection 1.3.

6.1.4 Climate

A description of regional climatic conditions is provided in subsection 1.3.3.

6.1.5 Site Hydrogeological Characteristics

A description of the site hydrogeological characteristics is provided in subsection 3.2.

6.2 Qualitative Human Exposure Assessment

6.2.1 Nature and Extent of Chemical Constituents

BTEX compounds were the principal VOCs detected in soil and groundwater samples at the site and are the common VOCs associated with coal tar. SVOCs were also detected at the site. PAHs are the common subset of SVOCs found in coal tar. Section 4 of this report provides a detailed description of the nature and extent of chemical constituents found on site and at relevant off site locations.

6.2.2 Chemical Fate and Transport

The fate and transport of chemicals in the environment are influenced by a variety of site- and chemical-specific factors. Environmental fate and transport processes for the COPCs at the Rockaway Park former MGP site are summarized briefly in this section and discussed in detail in Section 5.

The fate and transport of these chemicals in the environment depend on the properties of both the chemicals and the environmental media in which they occur. For organic constituents, physical and chemical properties such as water solubility, Henry's Law Constant, octanol-water partition coefficient, and organic-carbon partition coefficient, affect the fate and transport in the environment.

BTEX compounds have high vapor pressures and, therefore, would be expected to volatilize readily from environmental media to the atmosphere. Once released to the atmosphere, these compounds are rapidly photodegraded (broken down by light). These compounds have low

octanol/water coefficients (log Kow) and, therefore, do not adsorb well to soil or particulate matter present in the water column.

PAHs contain only carbon and hydrogen and consist of two or more fused benzene rings in linear, angular, or cluster arrangements. In general, most PAHs can be characterized as having low vapor pressure, low to very low water solubility, low Henry's Law constant, high log Kow, and high organic carbon partition coefficient (Koc). These properties indicate that PAHs remain bound to soil particles and do not freely enter the water column. High partition coefficients and low solubilities suggest that PAHs are likely to be adsorbed onto soil particles. Conversely, these properties indicate that most PAHs will not readily volatilize into the atmosphere.

Although PAHs are regarded as persistent in the environment, they are degradable by microorganisms. Environmental factors, microbial flora and physicochemical properties of the PAHs themselves influence degradation rates and degree of degradation. Important environmental factors influencing degradation include temperature, pH, redox potential (the tendency of a chemical to accept or donate electrons, or to become reduced or oxidized), and microbial species present. Physicochemical properties that influence degradation include chemical structure, concentration, and lipophilicity ("fat-loving" tendency).

In general, PAHs do not biomagnify in food chains, despite their high lipid solubility, probably because most PAHs are rapidly metabolized by the organisms that are exposed to them (Eisler, 1987).

6.2.3 Selection of Chemicals of Potential Concern

Several classes of chemicals were detected in the environmental media at the Rockaway Park former MGP site. COPCs for the site were selected using applicable and relevant guidance (EPA, 1989). Selection criteria were as follow:

- Chemicals not detected at least once above the limit of detection were automatically excluded from the assessment, regardless of the size of the data set

- Frequency of detection for chemicals in soil and groundwater was considered. Chemicals with a frequency of detection of less than 5% in a data set of 20 or more samples were excluded from the assessment

- Consideration also was given as to whether the detected chemical is related to historic and current uses of the site

A summary list of COPCs by medium is provided in Table 6-1.

Defining the objectives of the qualitative human exposure assessment includes establishing the assessment endpoints based on the fate and transport of relevant chemical constituents and identification of potential exposure populations and pathways occurring at the site. This process results in the production of a Conceptual Site Model (CSM). The CSM graphically represents a site and its environment and presents information regarding potential exposure routes for humans, plants, or animals. Exposure routes represent the course that a chemical may take from a source to an individual receptor. The exposure route is defined by a source, which is described by the measurement of concentrations of chemicals in a given medium (e.g., chemical concentrations in soil), a release mechanism (e.g., leaching from soil to groundwater), and a point of exposure (e.g., human skin). According to information provided by Environmental Data Resources, Inc. (EDR) and verified by area inspection, a number of land uses constituting potentially sensitive receptors are located within 2 miles of the site (see Figure 6-1C). Given available information collected during the field investigation, it is highly unlikely that potentially sensitive receptors would be exposed to site-related chemical constituents. The CSM for the site is provided in Figures 6-1A through 6-1D.

This human health exposure assessment provides qualitative descriptions of potential exposure to site-related COPCs for human populations who may reasonably be expected to contact site media under present or future conditions. This qualitative human exposure assessment is comprised of two primary components:

- Description of exposure setting and identification of potentially exposed populations
- Identification of exposure pathways

These components are discussed in greater detail in the following paragraphs.

6.2.4 Exposure Setting and Identification of Potentially Exposed Populations

Under current and future site use conditions, the potentially exposed populations (i.e., potential receptors) are those that might come into contact with the COPCs. Table 6-2 presents an exposure pathway matrix that depicts the various exposure routes for current and future on site and off site human populations.

6.2.4.1 Current Scenarios

Current human populations considered in this exposure assessment include on site trespassers and adult on-site KeySpan workers. While trespassing at the site is unlikely given current security measures, the potential for trespasser exposure was considered because the property could be accessed, with difficulty, over the fence. On-site exposure for trespassers is limited

to chemicals in surface soil. Current on-site KeySpan workers are those individuals currently engaged in activities required for the function and maintenance of that portion of the site devoted to KeySpan operations (i.e., regulator station operation and maintenance). Exposure to surface soil, subsurface soil, and groundwater (if these individuals were to engage in excavation work) is possible for these individuals. Exposure to chemicals in indoor air is not considered a significant pathway of concern for current exposure pathways because the on site three-story office building is currently vacant and is not used by any KeySpan workers. In addition, indoor air sampling has not detected site-related COPCs at concentrations that would be of concern (see Table 5-1). For both the trespasser and on site KeySpan worker, ambient air exposure is not considered to be a pathway of concern as exposed surface soil is limited and would not be a sufficient source of exposure to site-related COPCs based on soil vapor concentrations taken at the site. Other potential exposures for KeySpan workers are addressed in the *Substation Investigation Report and Delisting Petition* (D&B 2000).

Current off-site human populations considered in the exposure assessment include adults and children recreating on the narrow strip of land along Jamaica Bay, and nearby off-site adult utility workers. The adults and children that recreate on the land along Jamaica Bay may also fish in the Bay. Chemical exposure for nearby off-site utility workers could be expected because of the presence of subsurface utility lines in areas adjacent to the site. Off-site residents to the south of the site are not considered in this assessment as off site soil and groundwater analyses do not indicate that these media have been impacted by site-related COPCs. These results demonstrate that transport mechanisms to off site residents, one of the five elements of an exposure pathway, are not associated with the site.

6.2.4.2 Future Scenarios

Future uses of the immediate off site areas are not expected to change substantially from the current uses (see Figure 6-1D). Portions of the site may undergo redevelopment, while portions of the site use will likely remain the same (e.g. the LIPA substation). As a consequence, many of the current exposure scenarios also hold for future use of the site and surrounding areas. In addition, future use exposure scenarios consider potential receptors assuming that redevelopment may occur.

Additional future human populations considered in this exposure assessment include on site and off site construction workers, on site commercial workers, on site adult and child visitors to commercial establishments, on site adult and child residents, and off site adult and child recreationists. The construction worker is considered because virtually any site redevelopment would involve construction activity in some form. Potential on site exposure media for the construction worker include surface and subsurface soil, groundwater (because the depth to groundwater in most areas of the site is approximately 5 feet bgs, and ambient air.

The possibility exists that the site may be used in the future for commercial purposes. Thus, exposures for adult on site commercial workers and adult and child visitors to future on site commercial establishments are possible. These individuals may be exposed to chemicals in indoor air that may volatilize from the groundwater and subsurface soil underneath a future commercial structure.

Off-site construction worker exposure to areas surrounding the site is possible in the event of future off site redevelopment. As with the on site construction worker, potential exposure media for off site construction workers includes surface and subsurface soil, groundwater, and ambient air.

6.2.5 Identification of Exposure Pathways

Table 6-2 provides qualitative descriptions of the complete exposure pathways for all potential current and future on site and off site human populations. Under current site use conditions, the on site trespasser may be exposed to surface soil via the ingestion (oral), dermal, and inhalation (of particulates) routes.

On site KeySpan workers, who spend time both outdoors and in the office building, may be exposed to chemicals in surface soil and subsurface soil via the ingestion, dermal, and inhalation routes. In the event that excavation work is performed, potential exposures to groundwater are possible through dermal contact and vapor inhalation.

Under future site use conditions, assuming no remedial actions are taken, on site construction workers may receive exposure to surface and subsurface soil through ingestion and dermal contact, to groundwater via dermal contact, and to ambient air via inhalation. Exposure to ambient air considers both the inhalation of volatiles resulting from construction activities (i.e., trenching, excavation, installing deep piles, etc.) and fugitive soil particulate inhalation.

Given the potential for commercial redevelopment at the site, on site commercial workers and adult and child site visitors to these commercial establishments also are considered. Relevant potential exposures, absent remedial measures, for commercial workers and visitors include inhalation of vapors in indoor air.

Another possible future site scenario is redevelopment of the on-site property for residential use. These potential future on-site adult and child residents, absent remedial measures, may be exposed to site-related constituents via inhalation of fugitive soil particulates and volatile COPCs in ambient and indoor air, and ingestion and dermal contact with surface soil (groundwater is not considered potable due to a saline aquifer, thereby eliminating the possibility of future groundwater well installation). Adult on-site residents may also be

exposed to groundwater via dermal contact and inhalation of groundwater COPCs (only in the event of participating in excavation work on the property).

Off-site adult and child recreationists currently are present along the strip of land adjacent to Jamaica Bay. Exposures to surface soil via dermal contact, ingestion, and inhalation of soil particulates are considered complete, as exposed soil is present. It is possible that current and future off-site adult and child recreationists could be exposed to COPCs contained in subsurface soils if erosion in the bulkhead area continues to occur. Therefore, off-site adult and child recreationalists are considered potential receptors for both current and future exposure scenarios, albeit with exposures to different COPCs, in different soil strata (i.e., surface and subsurface soils). Future off-site adult and child recreationalists may be exposed to subsurface soil (as future surface soil) via dermal contact, ingestion, and inhalation of soil particulates and ambient air. Human receptor exposures to sediment and surface water are considered incomplete. While fishing off the bulkhead is a common activity in the area, no recreational activities that are associated with direct contact with surface water or sediment are known to take place at the area of concern. In addition, the bulkhead would impede any swimmer from easily reaching the surface water and the sediment is at greater depths (18 ft) than is normally associated with recreational exposure. Fish consumption, although possible, is an unlikely pathway for human exposure to PAHs as fish have been shown to metabolize PAHs (Eisler, 1987).

Potential exposure media for the nearby off-site utility worker includes surface and subsurface soil through ingestion, dermal contact and inhalation of soil particulates; and to groundwater via dermal contact and inhalation of groundwater COPCs. Most worker scenarios are not considered to have any potential exposures to surface water or sediment. A supplemental investigation is being performed to refine the understanding of the magnitude and extent of the dissolved phased BTEX groundwater plume trending northeasterly from the site. The findings from this investigation will be reported in a supplemental report and may affect the understanding of potential exposure for off site utility workers such as the adjacent wastewater treatment plant workers if they excavate beneath the water table.

Under future off site conditions, construction workers may receive exposure to surface and subsurface soil through ingestion and dermal contact, to groundwater via dermal contact, and to COPCs in ambient air via inhalation. Exposure to ambient air considers both the inhalation of volatiles resulting from construction activities (i.e., trenching, excavation, installing deep piles, etc.) and soil particulate inhalation.

6.2.6 Conclusions

There are several distinct receptor populations, both on site and in the vicinity of the site, who could potentially be exposed to site-related COPCs. These on site populations include:

trespassers, KeySpan workers, and substation workers under current site use conditions. Under future site use conditions, additional potential receptors include: construction workers, commercial workers, adult and child visitors to the commercial establishments, and adult and child residents. Relevant current off site receptor populations include adults and children recreating along Jamaica Bay; and nearby off site utility workers. Future off site receptor populations include all current off site populations and construction workers in the event of future off site redevelopment. A summary of the potential exposure pathways, by population and medium, is presented in Table 6-3. Table 6-3 provides context, in qualitative terms, of the potential for the exposures discussed above to actually occur. For example, the potential for on site trespasser exposure to site-related chemicals in surface soil is considered minimal because access to the site is restricted.

The RI and the qualitative human exposure assessment have indicated that there are pathways through which people on site and in the vicinity of the site could be exposed to COPCs related to former MGP activities. Based upon the findings of the Final RI, remedial actions, where warranted, will be addressed during the next phase of this program, the submittal of an FS.

6.3 Fish and Wildlife Resources Impact Analysis

Following the Appendix 1C Decision Key in the NYSDEC's Fish and Wildlife Resources Impact Analysis (1994) and Appendix 3C of the Draft DER-10 *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2002) document, an FWRIA was deemed required (see Table 6-4). Using procedures from the FWRIA guidance and of the Part 1: Resource Characterization guidance (Section 3.10.1) of DER-10, the following analysis identifies actual or potential risks to plants, fish and wildlife residing on and near the site from chemicals potentially migrating from the former MGP. The analysis focuses on risks associated with site-related chemicals detected in soil, groundwater, and sediment. This analysis contains:

- Site descriptions and a characterization of plant and animal resources and their value to humans
- The identification of regulatory standards and criteria for fish and wildlife
- Evaluations of potential exposure pathways to fish and wildlife from site-related chemicals of potential ecological concern (COPECs) to regulatory criteria or derived toxicological benchmarks for the protection of fish and wildlife
- Conclusions regarding the potential of exposure and possible risks to fish and wildlife on or near the site

6.3.1 Fish and Wildlife Resources

6.3.1.1 Terrestrial Resources

The U.S. Fish and Wildlife Service and the NYSDEC Natural Heritage Program were contacted regarding species of concern, significant habitats, and fishery resources within 0.5 mile of the site. In addition, a field reconnaissance survey of the site and surrounding 0.5-mile radius was conducted on September 22, 1999. The objectives of the survey were to:

- Map and describe plant communities and aquatic resources on and adjacent to the site
- Observe wildlife species
- Identify significant ecological resources
- Observe evidence of stress to plants and animals, if any, from site-related chemicals

Approximately one-third of the area within the 0.5-mile radius of the site is upland. Currently, commercial uses dominate the site and the land within 0.5 mile of it. Commercial areas are covered by buildings and asphalt. Little vegetation exists to support wildlife populations. As a result, much of the area is classified as paved road or urban structures. The paved road category includes much of the site, parking lots, streets, and sidewalks.

A New York City sewage treatment plant is located to the east of the site. The area immediately south of the site includes the MTA subway tracks and yard, followed by private residences. A commercial area, including auto service and retail businesses, is located to the west of the site. North of Beach Channel Drive and along Jamaica Bay is a narrow strip of land. This strip of land, formerly a part of the site, was previously acquired by the City of New York. The strip of land is bulkheaded and garbage was strewn over it at the time of VHB's field reconnaissance. MGP-related clinkers were also observed on this land. Subsequent to this reconnaissance, a driven sheet pile bulkhead improvement was installed by the City of New York outboard of the wooden pile bulkhead. This was installed by the City of New York as a part of the City's bulkhead restoration project.

Approximately 75% of the site itself may be classified as successional field. This area consists of a weedy field dominated by grasses and forbs that occur on sites that have been cleared for development. Dominant plant species include gray goldenrod (*Solidago nemoralis*), small white aster (*Aster vimineus*), Queen Anne's lace (*Daucus carota*) and crab grass (*Digitaria sanguinalis*). In some areas, woody vegetation such as staghorn sumac (*Rhus typhina*), tartarian honeysuckle (*Lonicera tatarica*) and tree-of-heaven (*Ailanthus*

altissima) have begun to invade these fields. Table 6-5 provides plant species identified during the reconnaissance in this successional field. Tar, construction and demolition debris, and clinkers were observed throughout this area. Information provided by the NYSDEC indicates that the New York City upland restoration activities will include the planting and maintenance of native species along the bulkhead strip as a part of the bulkhead restoration project.

6.3.1.2 Aquatic Resources

The site lies within the Jamaica Bay drainage basin. Jamaica Bay is a Class SB water body, indicating that the water is suitable for human consumption of fish, fish propagation, and fish survival.

The NYSDEC classifies salt-water bodies as SA, SB, SC, I, or SD. Title 6, Chapter 100, Part 700-705 of the New York State Code of Rules and Regulations (6NYCRR) defines the best usage of Class SB waters as:

- Suitable for primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

Jamaica Bay

Jamaica Bay is a saline to brackish, eutrophic (nutrient-rich) estuary covering about 25,000 acres, with a mean depth of 13 feet, a semidiurnal tidal range averaging 5 feet and a residence time of about 33 days. Loading of nutrients and organic matter into the Bay from sewage treatment plants and runoff results in phytoplankton blooms, and high suspended solid concentrations which, in turn, result in turbid water and low bottom dissolved oxygen concentrations. Jamaica Bay is in the middle of the New York City metropolitan area and the uplands around the Bay, as well as much of the Rockaway barrier beach, are dominated by urban, residential, commercial and industrial development. The Bay itself has been disturbed by dredging, filling and development, including construction of Floyd Bennett Field and John F. Kennedy Airport (USFWS, 1997).

Most of Jamaica Bay proper and portions of the uplands and barrier beach are part of the Gateway National Recreation Area. Administered by the National Park Service, the Recreation Area includes the 9,155-acre Jamaica Bay Wildlife Refuge, Breezy Point and Floyd Bennett Field. The Bay proper and portions of Rockaway Inlet encompass important breeding and juvenile nursery habitats for fisheries as well as year-round foraging areas for waterfowl, shorebirds, and colonial nesting water birds.

Jamaica Bay has been designated and mapped as an otherwise protected beach unit pursuant to the federal Coastal Barrier Resources Act. The New York State Department of State has

designated Jamaica Bay as Significant Coastal Fish and Wildlife Habitats, and the Bay up to high tide line is designated as a Critical Environmental Area by the NYSDEC. Jamaica Bay also was designated as one of three special natural waterfront areas by the New York City's Department of City Planning (USFWS, 1997).

Extensive dredging, filling, and development in and around the Bay have substantially altered it. The Bay continues to be threatened by poor water quality, loss of upland and wetland buffers, and disturbance of habitat areas. Virtually the entire watershed of Jamaica Bay is urban, developed land and the Bay receives substantial pollution from a variety of point and nonpoint sources. These sources include:

- Municipal wastewater discharge from three plants
- Combined sewer overflows
- Untreated storm water runoff from roads and developed areas (including runways at John F. Kennedy Airport)
- Leaching of contaminants from three large closed landfills
- Atmospheric pollution, especially soot and chemicals from transportation
- Windblown trash

6.3.1.3 Freshwater and Tidal Wetlands

Wetlands have been identified on the U.S. Fish and Wildlife National Wetland Inventory (NWI) Maps (Far Rockaway, NY quadrangles) and NYSDEC Tidal and Freshwater Wetland Maps (see Figure 6-1C of the CSM). Jamaica Bay is classified as various types of estuarine wetlands and mudflats.

Wetlands are regulated in New York under the state's Freshwater Wetlands Act of 1975 and the Tidal Wetlands Act of 1977. These statutes are in addition to federal regulation under Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act of 1977, and various Executive Orders.

6.3.1.4 Fish and Wildlife Resources

Wildlife uses in the area were evaluated using literature sources and field observations. Wildlife sightings, including direct observations and identifications based on vocalizations, tracks, browse, and scat, and general wildlife values (e.g., food and cover availability) were noted.

Federally listed endangered, threatened or species of concern are not known to occur within 0.5 mile of the site (Clough, 1999). State-listed endangered, threatened or special concern species were not identified within 0.5 mile of the site (Krahling, 2000; see Figure 6-1C and Table 6-6). The NYSDEC identified two gull nesting colonies, one on Ruffle Bar, located approximately 1.6 miles from the site, and one in Little Egg Marsh, located approximately 0.4 mile from the site. Jamaica Bay-Gateway National Recreation Area and Dubois Natural Area were identified as significant habitats.

The upland areas within 0.5 mile of the site consist of high-density residential homes and industrial/commercial properties. These areas typically consist of buildings and asphalt parking areas with landscaped areas consisting of trees and shrubs, which oftentimes are introduced exotics used for ornamental purposes. These areas do not support an abundance of wildlife because of the lack of vegetation, which could provide food and cover, and constant human activity. The successional fields with invading trees and shrubs, identified during the field reconnaissance, do provide habitat for wildlife. However, the small size of these areas limits the population they can support.

Tables 6-7 through 6-10 list the fish, herptile (amphibian and reptile), bird, and mammal species that may potentially occur within and adjacent to the site based on the land uses identified during the field reconnaissance. The species observed during the field reconnaissance (which are representative for the point in time of the field reconnaissance) also are identified in the tables. Figure 6-1C is a map of sensitive environmental receptors in the vicinity of the site. Figure 6-1D is a map of land use and cover types in the vicinity of the site.

6.3.1.5 Observation of Stress

No signs of stress to vegetation or wildlife were observed at or in the vicinity of the site during the site reconnaissance.

There are no recorded fish kills in the vicinity of the site.

There are no existing fish or wildlife consumptive advisories that are specific to the site or to the COPECs considered in this report (DOH, 2002).

6.3.1.6 Value of Habitat to Associated Fauna

Residential, commercial and industrial properties are of little value to wildlife. The site and surrounding area is developed; only isolated pockets of vegetation exist and, in most cases, these areas are maintained by frequent mowing. The wildlife expected to occur in the vicinity of the site includes more urbanized bird and mammalian species such as

mockingbird (*Mimus polyglottos*), house mouse (*Mus musculus*), and Norway rat (*Rattus norvegicus*).

The successional fields, including approximately 75% of the site, do provide minimal habitat and provide cover and food for wildlife. These areas typically have songbirds such as goldfinch (*Carsuelis tristis*) and song sparrow (*Melospiza melodia*), and small mammalian species, such as white-footed mouse (*Peromyscus leucopis*) and meadow vole (*Microtus pennsylcanicus*), which consume the seeds of grasses and forbs. Due to the limited size of these fields, larger mammalian and bird of prey species are not likely to occur.

The location of Jamaica Bay and the rich food resources found there make it a regionally important fish, wildlife and plant habitat complex. The geographic location acts to concentrate marine and estuarine species migrating between the New York Bight portion of the North Atlantic and the Hudson-Raritan Estuary (USFWS, 1997). The waters and sediments of Jamaica Bay are a highly productive and regionally significant habitat for finfish, shellfish, and wildlife. Jamaica Bay also is a significant wintering waterfowl concentration area and one of the most important migratory shorebird stopover sites in the New York Bight Area, especially during the fall migration (USFWS, 1997).

6.3.1.7 Value of Resources to Humans

The site and surrounding upland area are of little value to humans for recreational use of wildlife. The developed nature of the area precludes small game and deer hunting.

Jamaica Bay proper and portions of the uplands and barrier beach are part of the Gateway National Recreation Area. This area is an important recreational area for fishermen, outdoor enthusiasts and wildlife observers.

6.3.2 Exposure Pathways Analysis

6.3.2.1 Chemicals of Potential Ecological Concern

A number of substances were detected in surface soil, groundwater, and sediment. To focus the FWRIA on those chemicals that may pose risks to the environment, COPECs were selected. For this assessment, the chemicals detected in groundwater are not considered COPECs. The depth to groundwater is generally 5 feet bgs, which is below the root zone of most plants.

On-Site Soil

Surface- and subsurface-soil samples were collected from the site and analyzed for VOCs, SVOCs, Resource Conservation and Recovery Act (RCRA) metals, and total cyanide.

Seven samples were analyzed for full target compound list (TCL)/target analyte list (TAL). Only shallow subsurface-soil data (up to 4 feet bgs) were considered in this FWRIA. A total of 30 samples (15 surface soil and 15 subsurface soil) were analyzed in this depth interval. Data for deeper subsurface soils were not evaluated due to lack of exposure routes to wildlife. Most burrowing animals create dens in the upper 4 feet of soil. In addition, the deeper subsurface-soil samples (i.e., greater than 4 feet bgs) are below the root zone of most plants. Essential nutrients (calcium, iron, potassium, sodium and magnesium) are not considered COPECs. All other chemicals detected above detection limits are considered COPECs.

Off-Site Soil

Surface- and subsurface-soil samples were collected from the beach area adjacent to the site and analyzed for VOCs, SVOCs, RCRA metals, and total cyanide. Only shallow subsurface-soil data (up to 4 feet bgs) were considered in this FWRIA. Twelve samples (10 surface soil and 2 subsurface soil) were analyzed in this depth interval. Data for deeper subsurface soils were not evaluated due to lack of exposure routes to wildlife. Most burrowing animals create dens in the upper 4 feet of soil. In addition, the deeper subsurface soil samples (i.e., greater than 4 feet bgs) are below the root zone of most plants. Essential nutrients (calcium, iron, potassium, sodium, and magnesium) are not considered COPECs. All other chemicals detected above detection limits are considered COPECs.

Sediment

Sediment data are described in subsections 2.2.5 and 4.5. Sediment sample locations are shown on Plate 2. The sediment samples from nine locations adjacent to the site represent two depths, 0 to 0.3 foot and 0.3 to 3 foot. At one location, RPSED-6, samples were collected from multiple depths (0 to 0.3 foot; 0.3 to 1 foot, 1.9 to 2 feet, and 2.4 to 4 feet).

Eight background locations, also shown on Plate 2, are designated as RPSEDBG. Background samples were collected from the sediment surface.

Sediment samples were analyzed for BTEX, SVOCs, total cyanide, TOC, pH, hardness, and grain size. These data are presented on Table 4-41. The only site-related chemicals detected in sediment were PAHs. Seventeen PAH compounds were included in the analyses.

Because PAHs in sediment adjacent to the site exceeded screening benchmarks (NYSDEC 1999; Table 4-41) and background, they are selected as COPECs for this assessment.

6.3.2.2 Exposure Pathways

Wildlife resources in the industrial/residential areas surrounding the site are limited due to the lack of food and cover. Also, constant human disturbance limits the population to wildlife species more tolerant of human activity. Several state-listed endangered species are located within Jamaica Bay. In addition, state and federally regulated tidal wetlands are located in the Bay. Wetlands are considered significant natural resources. All these resources combine to make Jamaica Bay a significant coastal resource.

Most of the COPECs are PAHs and metals. The fate and transport mechanisms of these chemicals reduces the likelihood of future migration. Thus, exposure is likely to be limited to wildlife on or near the site.

Plant roots are not discriminating in the uptake of small organic molecules (molecular weight less than 500) except on the basis of polarity. The more water-soluble molecules pass through the root epidermis and translocate throughout the plant and are eventually volatilized from the leaves (Efroymson, et al., 1997b). Plants selectively uptake metals in soil by absorption from soil solution by the root. Metals may be bound to exterior exchange sites on the root and not actually taken up. They may enter the root passively in organic or inorganic complexes or actively by way of metabolically controlled membrane transport (Kabata-Pendias and Pendias, 1992). Once in the plant, a metal can be stored in the root or translocated to other plant parts. Wildlife will have limited exposure to these chemicals. Potential exposure could occur through direct contact with or accidental ingestion of contaminated soil or through the terrestrial food chain.

PAHs in sediment can be taken up by organisms (either benthic invertebrates or fish) in contact with sediment. Fish metabolize PAHs, and therefore, are unlikely to serve as a source of these compounds to organisms higher in the food chain, including human consumption. However, uptake of PAHs into invertebrates could serve as a source of these compounds to higher trophic level organisms.

On a spatial scale, the potentially impacted area of Jamaica Bay sediment adjacent to the site containing potentially site-related PAHs is within 150 feet of the bulkhead (Plate 2), while the bay itself comprises 25,000 acres. Due to the water depths adjacent to the site (approximately 18 feet), shore birds and waterfowl are not exposed to sediment or invertebrates in the study area.

The likely complete exposure pathways in the aquatic environment at the site are:

- Sediment to benthic invertebrates via direct contact and ingestion
- Benthic biota to fish through the food chain

6.3.3 Criteria-Specific Toxicity Assessment

6.3.3.1 Soil

The NYSDEC does not have soil cleanup criteria relating to the protection of wildlife, and the availability of applicable soil screening values in scientific literature is limited. The screening of soil COPECs was conducted by comparing the chemical concentrations to available screening benchmark values derived by the Oak Ridge National Laboratory (ORNL) (Efroymson et al. 1997a, 1997b and Sample et al. 1996) for the U.S. Department of Energy. The benchmark values are the 10th percentile of the distribution of various toxic effects threshold for the chemicals in soil for a group of organisms.

Transformation or loss due to environmental degradation is not considered in this assessment. It is assumed that following uptake, concentration in soil will equal concentrations in an organism. This assumption overestimates potential risk in that wildlife has limited contact with these chemicals in soil and plants.

Benchmark values for three groups of organisms, where available or derived, are presented in Table 6-11. Terrestrial plants were selected since they are critical in nutrient cycling and are a source of food in the diets of higher animals. Also, plants may take up some of the COPECs. Earthworms were selected because of their importance in maintaining soil fertility through burrowing and feeding activities. Also, earthworms are at the base of the food chain and are an important food item for higher organisms. Meadow voles were selected to represent an herbivorous small mammal. The benchmark values for meadow vole are presented as dietary concentrations in milligram (mg) of chemical per kilogram (kg) of diet that would result in no observed adverse effect levels (NOAELs). For screening purposes, it was assumed that the chemical concentration in soil would be found in the food items of these species. As stated previously, this is a conservative approach that should result in the overestimation of potential exposure and risk.

As indicated in Table 6-11, screening values are available for a few of the COPECs. Therefore, the methodology of the ORNL (Sample, et al., 1996) was used to derive toxicological benchmarks for the meadow vole from published toxicological data for laboratory animals. Literature sources included IRIS (EPA, 2000), HEAST (EPA, 1997), and the National Toxicology Program. It should be emphasized that the resulting benchmarks obtained from this methodology and toxicological data are based on a

conservative approach whose resulting relationship to potential population effects is uncertain.

NOAELs and lowest observed adverse effect levels (LOAELs) are daily dose levels normalized to the weight of the test animal and are presented in units of mg/kg/day. The presentation of toxicity data on a mg/kg/day basis allows for comparison across species with appropriate consideration for differences in body sizes. If a NOAEL (or LOAEL) for a mammalian test species (NOAELt) is available, then the equivalent NOAEL (or LOAEL) for a mammalian wildlife species (NOAELw) can be calculated by using an adjustment factor for the difference in body size:

NOAELw = NOAELt x (bwt/bww) 0.25

Where:

NOAELw = No observed adverse effect level for wildlife species (mg/kg/day)
NOAELt = No observed adverse effect level for test species (mg/kg/day)
bww = Body weight for wildlife species (kg)
bwt = Body weight for test species (kg)

In some cases, a NOAEL for a specific chemical was not available, but a LOAEL or lethal dose (LD50) had been determined experimentally. The NOAEL can be estimated by applying an uncertainty factor (UF) to the LOAEL or LD50. In the EPA methodology (EPA 1989), the LOAEL or LD50 can be reduced by a factor of 10 or 50, respectively, to derive the NOAEL.

The dietary level or concentration in food (Cf) of a chemical in mg of chemical per kg of food that would result in a dose equivalent to the NOAEL can be calculated from the food factor (f).

The food factor is the amount of food consumed per day per unit of body weight. Table 6-12 provides the body weight, food intake and food factors used in the derivation of chemical-specific NOAELS for the meadow vole. Table 6-13 provides the derived toxicological benchmarks for the meadow vole.

Screening the maximum concentrations of the on site soil COPECs against the literature and derived benchmark values indicated the following.

- Several chemicals exceeded their respective benchmark values and may pose a risk to environmental receptors. They include toluene, total xylenes, 2-methylnaphthalene, benz(a)anthracene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, dibenzofuran,

fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, aluminum, arsenic, lead, selenium, vanadium, and zinc.

- Several chemicals did not exceed their respective benchmark values and do not pose a risk to environmental receptors. These include 2-butanone, acetone, benzene, ethylbenzene, methylene chloride, styrene, tetrachloroethene, trichloroethene, 4-methylphenol, acenaphthene, acenaphthylene, anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, carbazole, fluoranthene, naphthalene, antimony, barium, cadmium, chromium, cobalt, total cyanide, manganese, mercury, nickel, and silver.

Screening the maximum concentrations of the off site soil COPECs against the literature and derived benchmark values indicated the following.

- Several chemicals exceeded their respective benchmark values and may pose a risk to environmental receptors. These include benz(a)anthracene, pyrene, and lead.

- Several chemicals did not exceed their respective benchmark values and do not pose a risk to environmental receptors. These include 2-butanone, acetone, benzene, ethylbenzene, methylene chloride, styrene, tetrachloroethene, trichloroethene, toluene, total xylenes, 2-methylnaphthalene, 4-methylphenol, acenaphthene, acenaphthylene, anthracene, benzo(b)fluoranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, carbazole, fluoranthene, naphthalene, arsenic, barium, cadmium, chromium, total cyanide, mercury, selenium, and silver.

6.3.3.2 Sediment

Table 4-41 compares concentrations of PAHs in sediment adjacent to the site and in background locations to Standards, Criteria, and Guidelines (SCGs) identified by NYSDEC (1999). For estuarine areas, such as Beach Channel and Jamaica Bay, the SCGs for sediment are the Effects Range-Low (ER-L) and Effects Range-Median (ER-M) developed by Long, et al. (1995).

Long, et al. (1995) describe the ER-L and ER-M values as:

> "The concentrations below the ER-L value represent a minimal-effects range; a range intended to estimate conditions in which effects would be rarely observed. Concentrations equal to and above the ER-L, but below the ER-M, represent a possible-effects range within which effects would

> occasionally occur. Finally, the concentrations equivalent to and above the ER-M value represent a probable-effects range within which effects would frequently occur."

Total PAHs in surficial sediment ranged from 0.06 to 18.11 mg/kg, while concentrations in deeper sediment ranged from below detection limits to 322 mg/kg. No surficial sediment sample exceeded the ER-M. The average surficial sediment concentration was 7.1 mg/kg. The average concentration of deeper sediments was 40.4 mg/kg, but when excluding two samples in RPSED02-6, the average concentration was 6.6 mg/kg. Background concentrations ranged from below detection limits (in two samples) to 6.8 mg/kg. This background range is consistent with regional data from EPA (1998) that indicate that the background concentration for total PAHs in the New York/New Jersey Harbor system, including Jamaica Bay, is 7.7 mg/kg.

The data were analyzed following the methods of EPA (1998) and others (for example, New York/New Jersey Harbor Estuary Program (2002)) in Jamaica Bay. ER-Ls for total PAHs were exceeded in samples adjacent to the site (see Table 6-14) and in background samples.

ER-M values were exceeded by two subsurface samples near the bulkhead (RPSED02-6). Slightly less than half of the surface samples were below ER-Ls for total PAH and the remainder were between ER-L and ER-M concentrations. One-quarter of background samples exceeded the ER-L for total PAHs.

ER-Ls and ER-Ms for individual PAHs were exceeded in some shallow and deep sediment samples adjacent to the site. Background samples also have individual PAH concentrations that exceeded ER-Ls, but not ER-Ms.

Several samples exceeded effect levels for individual PAH compounds, including:

- Samples in which the ER-Ls are exceeded for individual PAH compounds, but not for total PAHs: RPSED02-4 (0-0.3), RPSED02-5 (0-0.3), RPSED02-5 (0.3-3), RPSED02-6 (2.4-4.4), RPSEDBG-G, and RPSEDBG-H

- Samples in which ER-Ls for individual and total PAHs are exceeded: RPSED02-2 (0-0.3), RPSED02-2 (0.3-3), RPSED02-3 (0-0.3), RPSEDBG-A, and RPSEDBG-D

- Samples in which ER-M values are exceeded for individual, but not total PAHs: RPSED02-1 (0-0.3), RPSED02-3 (0.3-3), RPSED02-6 (0-0.3), RPSED02-7 (0.3-3), RPSED02-9 (0-0.3), and RPSED02-9 (0.3-3)

- Samples in which ER-M values are exceeded for individual and total PAHs: RPSED02-6 (0.3-1.9), RPSED02-6 (1.9-2.4)

The sediment data indicate that the conditions present a minimal toxicity to benthic invertebrates as a prey base for fish. In addition, the potential impact area is small compared to the size of Jamaica Bay (25,000 acres), which also mitigates possible impacts to fish. Twenty-two fish species potentially present in Jamaica Bay are listed in Table 6-7. Table 6-15 presents these fish species with their habitat and diet requirements and foraging and home ranges.

Many of the Jamaica Bay species are migratory and spend only a fraction of time in shallow embayments (e.g., sea lamprey, alewife, American shad, Atlantic sturgeon, striped bass, bluefish, black sea bass, Atlantic silverside, bay anchovy, Atlantic menhaden, scup, blackfish or tautog, weakfish, sea robin, summer flounder, and blueback herring), and therefore are unlikely to have significant exposure at the site. Other resident species (e.g., striped killifish and mummichog) are more likely to be found in marsh areas and therefore are unlikely to be present adjacent to the site. Some resident species have large home ranges (e.g., winter flounder) or feeding habits (e.g., windowpane) that limit their exposure to site-related PAHs. Overall, exposure of fish to PAHs in sediment near the Rockaway site is mitigated by the areal range of most fish species, migration activities, and habitat and feeding preferences.

6.3.4 Conclusions

6.3.4.1 Habitat Characterization

The site reconnaissance conducted as part of this analysis indicated that the site and surrounding upland areas are poor quality environmental resources, due to the limited presence of vegetation. The site is partially covered with buildings and asphalt. Wildlife species that are present are adapted to urban settings. Due to the size of the vegetated areas, only a few individuals will be present.

The location of Jamaica Bay and the rich food resources found there make it a regionally important fish, wildlife and plant habitat complex. Several state-listed endangered species are located within Jamaica Bay. In addition, state and federally regulated tidal wetlands are located in the Bay. Wetlands are considered significant natural resources. All these resources combine to make Jamaica Bay a significant coastal resource.

6.3.4.2 Soil

Several COPECs were detected at concentrations greater than the toxicological benchmark values. While this finding suggests that these chemicals may pose a risk of impact to wildlife, the potential risk of impact due to COPECs is minimal for several reasons.

Exposure frequency, chemical concentration (especially within the upper 6 inches of soil), mechanism of exposure, and duration of exposure determine risk. The site and immediate surrounding area are residential, commercial or industrial properties. The commercial and industrial areas have minimal habitat in the form of "weedy" patches that would not support a wildlife population. The residential areas are comprised of high-density, single-family homes surrounded primarily by asphalt parking and minimal maintained lawns. These areas experience constant physical disturbance that prevents populations of wildlife from developing. Because only transient species and a few individual animals would use this area, the frequency and duration of exposure are limited. The future use of the site is expected to be of a type that will not support a significant wildlife population.

6.3.4.3 Sediment

Several COPECs were detected at concentrations greater than the toxicological benchmark values. However, no surficial sediment samples had total PAH concentrations above ER-Ms. Two subsurface sediment samples located near the bulkhead exceeded the ER-M for total PAHs. Several sediment samples had individual PAHs above ER-Ms. About half of the surficial sediment samples are within an Effects Range in which effects occasionally occur (i.e., ER-M) and half the surficial samples are within an effects range in which ecological effects rarely occur (i.e., the ER-L). The area of affected sediment is small in comparison with the available habitat in Jamaica Bay. In addition, because most Jamaica Bay fish species are migratory or have habitat preferences that would preclude their presence at the site for any length of time, any effect on the prey base in such a small area is unlikely to have an effect on fish in Jamaica Bay.

7. Conceptual Site Model

This section discusses the conceptual site model as it pertains to the nature of the physical observations of tar, staining, sheen and odors, migration pathways, and receptors. The data collected at the site from 1989 to the present indicate there are four source areas located at the site. These source areas are:

- Former tar separator and former holder in the central portion of the former gas works area
- Former skimming basin in the northern portion of the former gas works area
- Former 2-million cubic-foot Gas Holder and former drip tanks in the eastern portion of the former gas works area
- Historic filling area located in the former electric substation area

The majority of tar observations were observed on soil in these areas. Cross Sections A-A' through E-E' on Plates 13 through 15 and Plates 8 through 12 depict the vertical and lateral extent of physical observations of tar in the subsurface soils. The observations indicate that tar-saturated soils occur in discontinuous lenses and layers in the soil intervals. The tar-saturated soils become more limited in lateral extent in the deep (2) soil interval to a maximum depth of 105 feet in well RPMW-09D2. Blebs and sheens were observed in the soil connecting the former tar separator area with the skimming basin to depths of approximately 55 bgs. Additionally, blebs and sheens extended from the historic fill area to the skimming basin to depths of approximately 26 feet bgs. Physical observations obtained from monitoring well MW-02D2 located on Beach Channel Drive near the bulkhead area contained tar-saturated bands down to a depth of 66 feet bgs.

The tar-impacted soils extend between the source areas by migrating through coarse sand and shell bearing layers. Once released, the tar is hypothesized to have continued to migrate downward through the subsurface by grain-to-grain movement within these coarse-grained sands and collected in localized lenses of these coarse sands. These coarse-grained sands may contribute to the lateral migration of tar. Tar may also be migrating laterally due to the changing groundwater flow direction between north and south at low and high tide.

Tar-saturated soils were not observed in the Rockaway Freeway, Beach 108th Street, and Beach Channel Drive with the exception of the MW-02 well cluster in the bulkhead area.

Generally, concentrations of total BTEX and TPAHs are significantly reduced away from the source areas.

The highest groundwater concentrations were generally detected in source areas with tar-saturated soils. However, well RPMW-02I had one of the highest total BTEX concentrations and the highest TPAH concentration of wells sampled, indicating that contamination is migrating through coarse sand layers away from the former skimming basin to the bulkhead area. The groundwater data indicate that contamination from the tar-saturated areas is migrating primarily to the north away from the source areas. A shallow dissolved phase BTEX groundwater plume follows the northeasterly groundwater flow direction depicted on Plate 3. The dissolved phase BTEX groundwater plume extends from approximately the locations of RPGP-06 to RPGP-27 along Beach 108th Street. The regional groundwater flow appears to flow generally to the north towards Jamaica Bay in this area. It is anticipated that this dissolved phase BTEX plume migrates northeasterly beneath the WWTP and that the groundwater flow direction eventually shifts to the north with regional groundwater flow toward Jamaica Bay. A supplemental work plan will be submitted to investigate this groundwater plume and the results will be included in a supplemental remedial investigation report.

Measurable DNAPL was observed in wells RPMW-07I/D, RPMW-09I/D/D2, and PZ-08. These wells are located near the former tar separator and skimming basin. No measurable DNAPL was observed in other wells at the site, suggesting that the measurable DNAPL is migrating vertically downward in these source areas. Measurable LNAPL was observed in monitoring wells PZ-05, PZ-08, and RPMW-11S. Wells PZ-05 and PZ-08 were located in the former engine room and former tar separator. Well RPMW-11S is located in Beach Channel Drive near the bulkhead area. The locations of these wells indicate that historic spills and releases from these areas impacted the soil. The LNAPL is present due to residual contamination present in the subsurface soil and being released to groundwater. No measurable LNAPL was observed in nearby wells, indicating that the LNAPL areas are limited to the vicinity of PZ-05, PZ-08, and RPMW-11S.

8. Summary/Conclusions

The source areas for tar were primarily detected in four areas at the site:

- Former tar separator and holders in the central portion of the former gas works area
- Former skimming basin in the northern portion of the former gas works area
- Former 2-million cubic-foot Gas Holder and former drip tanks in the eastern portion of the former gas works area
- Historic landfilling area located in the former electric substation area

The observations indicate that tar-saturated soils occurred in discontinuous lenses and layers in the soil intervals. The tar-saturated soils become more limited in lateral extent in the deep (2) soil interval to a maximum depth of 105 feet in well RPMW-09D2. Blebs and sheens were observed in the soil connecting the former tar separator area with the skimming basin to depths of approximately 55 bgs. Additionally, blebs and sheens extended from the historic fill area to the skimming basin to depths of approximately 26 feet bgs. Physical observations obtained from monitoring well MW-02D2 located on Beach Channel Drive near the bulkhead area contained tar-saturated bands down to a depth of 66 feet bgs.

The tar-impacted soils extend between the source areas by migrating through coarse sand layers with shell-bearing layers and collecting in localized lenses of these coarse sands. Tar-saturated soils were not observed in the Rockaway Freeway, Beach 108th Street, and Beach Channel Drive with the exception of the MW-02 well cluster in the bulkhead area. Generally, concentrations of total BTEX and TPAHs are significantly reduced away from the source areas.

Impacted sediments are generally limited to areas immediately adjacent to the site. Elevated PAH concentrations are found in sediments nearest the site and centered around RPSED02-6, and constitute a small area located within approximately 150 feet offshore of the bulkhead along the frontage of the site. The analysis of the background sediments demonstrates that PAHs unrelated to the site are present pervasively throughout the Beach Channel portion of Jamaica Bay, and concentrations are generally consistent with information available for this reach of Jamaica Bay.

The highest groundwater concentrations were generally detected in source areas with tar-saturated soils. However, well RPMW-02I had one of the highest total BTEX concentrations and the highest TPAH concentration of wells sampled, indicating that contamination is migrating through coarse sand layers away from the former skimming basin to the bulkhead area. The groundwater data indicate that contamination is migrating primarily to the north away from the source areas. A shallow dissolved phase BTEX groundwater plume extends northeast from the southeast corner of the site to approximately the locations of RPGP-06 to RPGP-27 along Beach 108th Street. It is anticipated that this dissolved phase BTEX plume migrates northeasterly beneath the WWTP and that the groundwater flow direction eventually shifts to the north with regional groundwater flow toward Jamaica Bay. A supplemental work plan will be submitted to investigate this groundwater plume and the results will be included in a supplemental remedial investigation report.

Measurable DNAPL was observed in wells RPMW-07I/D, RPMW-09I/D/D2, and PZ-08. These wells are located near the former tar separator and skimming basin. No measurable DNAPL was observed in other wells at the site, suggesting that the measurable DNAPL is migrating vertically downward in these source areas. Measurable LNAPL was observed in monitoring wells PZ-05, PZ-08, and RPMW-11S. Wells PZ-05 and PZ-08 were located in the former engine room and former tar separator. Well RPMW-11S is located in Beach Channel Drive near the bulkhead area. The locations of these wells indicate that historic spills and releases from these areas impacted the soil.

A qualitative human exposure assessment indicated that current and likely future populations may be exposed to chemicals related to the MGP at adverse concentrations in both on site and off site areas. Potential on site receptors include possible trespassers; KeySpan workers; and substation workers under current site use conditions. Under future site use conditions, potential receptors include construction workers; commercial workers; and adult and child visitors to the commercial establishment. Potential current and future off site receptors include adults and children recreating along the bulkhead adjacent to Jamaica Bay; and nearby off site utility workers and possible construction workers.

Several COPECs were detected in soil at concentrations greater than applicable toxicological benchmarks; however, the potential risk of impact due to these COPECs is considered minimal.

A fish and wildlife resources impact analysis indicated that the site and surrounding upland areas are poor quality environmental resources and that wildlife species that are present are adapted to urban settings. Several COPECs were detected in soil at concentrations greater than applicable toxicological benchmarks; however, the potential risk of impacts due to these COPECs is considered minimal. The current and expected future uses of the site are of a type that will not support a significant wildlife population. The location of Jamaica Bay and the rich food resources found there make it a regionally important fish, wildlife and plant

habitat complex. Several COPECs were detected at concentrations greater than the toxicological benchmark values in sediment. However, no surficial sediment samples had total PAH concentrations above ER-Ms. The area of affected sediment is small in comparison with the available habitat in Jamaica Bay. In addition, because most Jamaica Bay fish species are migratory or have habitat preferences that would preclude their presence at the site for any length of time, the limited impacts are unlikely to have an effect on fish in Jamaica Bay.

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Tables

Figures

Plates

Appendix A

Supplemental Remedial Investigation Work Plans and NYSDEC Approval Letters

Appendix B

Soil Boring Logs, Monitoring Well Construction Logs, and Test Pit Logs

Appendix C

Hydraulic Conductivity Calculations

Appendix D

Chain-of-Custody Forms and Data Validation Reports – Soils

Appendix E

Chain-of-Custody Forms and Data Validation Reports - Groundwater

Appendix F

Chain-of-Custody Forms and Data Validation Reports - Sediments

List of Tables

1-1 Climatological Normals and Means – John F. Kennedy Airport
2-1 Sample Collection Rationale
2-2 Monitoring Well Construction Data
2-3 Groundwater Depths and Elevation
2-4 Final Groundwater Parameters
3-1 Hydraulic Conductivity Values
3-2 Vertical Hydraulic Head Differential and Gradients Within the Water Table Aquifer
4-1 Soil Analytical Results Former Gas Works Area (0-12 feet)
4-2 Soil Analytical Results Former Gas Works Area (12-24 feet)
4-3 Soil Analytical Results Former Gas Works Area (24-45 feet)
4-4 Soil Analytical Results Former Gas Works Area (45-90 feet)
4-5 Soil Analytical Results Former Gas Works Area (>90 feet)
4-6 Soil Analytical Results Former Electric Substation Area (0-12 feet)
4-7 Soil Analytical Results Former Electric Substation Area (12-24 feet)
4-8 Soil Analytical Results Former Electric Substation Area (24-45 feet)
4-9 Soil Analytical Results Former Electric Substation Area (45-90 feet)
4-10 Soil Analytical Results Former Electric Substation Area (>90 feet)
4-11 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
4-12 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (12-24 feet)
4-13 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (24-45 feet)
4-14 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (45-90 feet)
4-15 Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area (>90 feet)
4-16 Soil Analytical Results Current Electric Substation Area (0-12 feet)
4-17 Soil Analytical Results Current Electric Substation Area (12-24 feet)
4-18 Soil Analytical Results Current Electric Substation Area (24-45 feet)
4-19 Soil Analytical Results Current Electric Substation Area (45-90 feet)
4-20 Soil Analytical Results Bulkhead Area (0-12 feet)
4-21 Soil Analytical Results Bulkhead Area (12-24 feet)
4-22 Soil Analytical Results Bulkhead Area (24-45 feet)
4-23 Soil Analytical Results Bulkhead Area (45-90 feet)
4-24 Soil Analytical Results Bulkhead Area (>90 feet)
4-25 Soil Analytical Results South and West Adjacent Areas (0-12 feet)
4-26 Soil Analytical Results South and West Adjacent Areas (12-24 feet)

List of Tables (cont.)

4-27 Soil Analytical Results South and West Adjacent Areas (24-45 feet)
4-28 Soil Analytical Results South and East Adjacent Areas (0-12 feet)
4-29 Soil Analytical Results South and East Adjacent Areas (12-24 feet)
4-30 Soil Analytical Results South and East Adjacent Areas (24-45 feet)
4-31 Soil Analytical Results South and East Adjacent Areas (45-90 feet)
4-32 Surface Soil Analytical Results Former Gas Works Area
4-33 Surface Soil Analytical Results Former Electric Substation Area
4-34 Surface Soil Analytical Results Former 2-Million Cubic Foot Holder and Drip Tank Area
4-35 Surface Soil Analytical Results Current Electric Substation Area
4-36 Surface Soil Analytical Results Bulkhead Area
4-37 Shallow Groundwater Analytical Results (0-17 feet)
4-38 Intermediate Groundwater Analytical Results (17-45 feet)
4-39 Deep Groundwater Analytical Results (45-90 feet)
4-40 Deep (2) Groundwater Analytical Results (>90 feet)
4-41 Jamaica Bay Sediments Analytical Results
4-42 Summary of Sediment PAH Concentrations
4-43 Analytical Data Statistical Summary
5-1 Soil Vapor and Ambient Air Analytical Results
6-1 Human Health Chemicals of Potential Concern
6-2 Exposure Matrix for the Rockaway Park Former Manufactured Gas Plant
6-3 Rockaway Park Former MGP Site Summary of Potential Exposures
6-4 Fish and Wildlife Resources Impact Analysis Decision Key
6-5 Plant Species Identified During Field Reconnaissance
6-6 Endangered and Threatened Species in the Vicinity of the Rockaway Park Site
6-7 Fish Species That May Be Present in Jamaica Bay
6-8 Herptile Species That May Be Present Based on Available Habitat
6-9 Bird Species That May Be Present Based on Cover Types
6-10 Mammals That May Be Present Based on Cover Types
6-11 Comparison of Rockaway Park Surface Soil Data to Toxicological Benchmark Values
6-12 Parameters for Calculation of Toxicological Benchmarks
6-13 Derivation of Toxicological Benchmarks for the Meadow Vole
6-14 Comparison of Sediment Results to ER-M and ER-L Values
6-15 Fish Species of Jamaica Bay Potentially Exposed to Site-Related PAHs

Table 1-1
Rockaway Park Former MGP Site Remedial Investigation
Monthly Average Temperature and Precipitation for
John F. Kennedy Airport, Jamaica, Queens, New York

Month:	Jun	Jul	Aug	Sept	Oct
Precipitation (inches)	3.65	3.80	3.41	3.30	2.88
Temperature (°F)	69.4	75.5	74.7	67.6	57.0
Average Maximum	73.9	78.7	78.0	71.8	63.5
Average Minimum	66.9	72.2	72.2	64.1	52.4

Notes:
*Monthly average temperature (in degrees Fahrenheit) and precipitation data (in inches) from National Climatic Data Center.

Table 2-1
Sample Collection Rationale
Rockaway Park Former MGP Site

Investigation Method/Technology	Sample Point ID	Maximum Drilled Depth (ft)	No. of Samples Selected for Analysis	Analysis					Sample Point Objectives/Comments
				BTEX [1]	PAHs [2]	Total CN [3]	BTEX and PAH by SPLP [4]	Field Parameters [5]	
Former Gas Works Area									
Rotosonic Soil Borings	RPSB-117	NA	NA	NA	NA	NA	NA	NA	Sample Point ID RPSB-117 was intentionally skipped.
	RPSB-118	67	3	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil north of the Former Gas Works.
	RPSB-119	97	3	X	X	X	X	--	Contingent boring installed to evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil north of the Former Gas Works and west of the former skimming basin based on impacts observed in RPSB-118, RPSB-120, and RPMW-07D2.
	RPSB-120	67	3	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil north of the Former Gas Works.
	RPSB-121	127	4	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil in the vicinity of the Former Purifiers in the northern portion of the Former Gas Works.
	RPSB-122	77	4	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil in the vicinity of the Former Coke Pile.
	RPSB-123	146	5	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil in the center of the Former Gas Works area.
	RPSB-124	77	4	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil in the vicinity of the Former Generator House.
	RPSB-129	97	3	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil between the former skimming basins and the from electric substation area.
	RPSB-124	77	4	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil in the vicinity of the Former Generator House.
Geoprobe Boring	RPSB-09A	12	3	X	X	X	--	--	Further characterize the observations of purifier waste in the shallow subsurface soil.
Monitoring Well Installation and Sampling	RPMW-07D2	107	3/1*	X	X	X	--	X	Monitor zones of identified NAPL. Define PAHs in deep groundwater from RPMW-07D and RPMW-07I.
	RPMW-08D	77	1	X	X	X	--	X	Monitor zones of identified NAPL. Define PAHs in deep groundwater from RPMW-08I.
	RPMW-08D2	107	3/1*	X	X	X	--	X	Monitor zones of identified NAPL. Define PAHs in deep (2) groundwater from RPMW-08I.
	RPMW-15D	77	3/1*	X	X	X	--	X	Monitor zones of identified NAPL. Define BTEX in deep groundwater from RPMW-15I.
Former Electric Substation Area									
Rotosonic Soil Borings	RPSB-125	67	3	X	X	X	X	--	Further evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil.
	RPSB-126	60	3	X	X	X	X	--	Further evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil.
Surface Soil Samples	RPSS-17	2-inches	1	X	X	X	--	--	Further characterize the surface soil conditions in the vicinity of the former substation.
	RPSS-18	2-inches	1	X	X	X	--	--	Further characterize the surface soil conditions in the vicinity of the former substation.
	RPSS-19	2-inches	1	X	X	X	--	--	Further characterize the surface soil conditions in the vicinity of the former substation.
Monitoring Well Installation and Sampling	RPMW-18I	47	1	X	X	X	--	X	Monitor zones of identified NAPL in the vicinity of the former substation. Location will be determined in the field.
	RPMW-18D	97	3/1*	X	X	X	--	X	Monitor zones of identified NAPL in the vicinity of the former substation. Location will be determined in the field.
Former Two-Million Cubic Foot Holder and Drip Tank Area									
Rotosonic Soil Boring	RPSB-128	17	2	X	X	X	--	--	Further evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in shallow subsurface soil.
Geoprobe Boring	RPSB-128A	30	2	X	X	X	--	--	Contingent boring to further evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in shallow subsurface soil outside the footprint of the former 2-Million CF holder pad.
Monitoring Well Installation and Sampling	RPMW-14D2	107	3/1*	X	X	X	--	X	Further evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in deep soils and monitor zones of identified NAPL.

Table 2-2
Monitoring Well Construction Data
Rockaway Park Former MGP

Well Data	Well ID	Lithology of Screened Interval	Screened Interval (feet below ground surface)	Top of Casing Elevation (feet above msl)	Elevation of Center of Well Screen (feet, MSL)
Well Cluster:	RPMW-01S	Fill	5-15	8.24	-1.76
	RPMW-01I	Sand with Shells	35-45	8.06	-31.94
Well Cluster:	RPMW-02S	Fill, Sand with Shells	5-15	11.17	1.71
	RPMW-02I	Sand with Shells	35-45	10.94	-29.06
	RPMW-02D	Sand with Shells	64-74	11.09	-57.91
	RPMW-02D2	Sand with Shells, Sand with Silt lenses	95-105	11.26	-88.74
Well Cluster:	RPMW-03S	Fill, Sand with Shells	5-15	7.13	-2.87
	RPMW-03I	Sand with Shells	35-45	7.32	-32.68
	RPMW-03D	Sand with Shells, Sand with Silt lenses	65-75	8.03	-61.97
Well Cluster:	RPMW-04S	Fill	5-15	11.48	1.48
	RPMW-04I	Sand with Shells	35-45	10.7	-29.30
Well Cluster:	RPMW-05S	Fill, Sand with Shells	5-15	11.3	1.30
	RPMW-05I	Sand with Shells	35-45	11.7	-28.30
Intermediate Well:	RPMW-06I	Sand with Shells	35-45	12.49	-27.51
Well Cluster:	RPMW-07S	Fill, Sand with Shells	1.5-11.5	7.89	1.39
	RPMW-07I	Sand with Shells	35-45	7.86	-32.14
	RPMW-07D	Sand with Shells	65-75	7.82	-62.18
	RPMW-07D2	Sand with Silt lenses	95-105	7.75	-92.25
Well Cluster:	RPMW-08S	Sand with Shells	5-15	11.84	1.84
	RPMW-08I	Sand with Shells	35-45	11.79	-28.21
	RPMW-08D	Sand with Shells, Sand with Silt lenses	65-75	11.25	-58.75
	RPMW-08D2	Sand with Silt lenses	95-105	10.81	-89.19
Well Cluster:	PZ-08	Fill, Sand with Shells	2-12	7.18	0.18
	RPMW-09I	Sand with Shells	35-45	10.16	-29.84
	RPMW-09D	Sand with Shells	66-76	10.08	-60.92
	RPMW-09D2	Sand with Shells	95-105	10.2	-89.80
Well Cluster:	RPMW-10S	Fill, Sand with Shells	5-15	11.14	1.14
	RPMW-10I	Sand with Shells	35-45	11.18	-28.82
Well Cluster:	RPMW-11S	Fill	5-15	9.63	-0.37
	RPMW-11I	Sand with Shells	35-45	9.65	-30.35
	RPMW-11D	Sand with Shells*	65-75	9.57	-60.43
Well Cluster:	RPMW-12S	Fill, Sand with Shells	5-15	13.46	3.46
	RPMW-12I	Sand with Shells	35-45	13.34	-26.66
	RPMW-12D	Sand with Shells	65-75	12.71	-57.29
	RPMW-12D2	Sand with Shells, Sand with Silt lenses	95-105	12.81	-87.19
Well Cluster:	RPMW-13S	Fill, Sand with Shells	5-15	13.78	3.78
	RPMW-13I	Sand with Shells	35-45	13.96	-26.04
	RPMW-13D	Sand with Shells	65-75	14.1	-55.90
	RPMW-13D2	Sand with Shells, Sand with Silt lenses	95-105	14.2	-85.80
Well Cluster:	RPMW-14S	Fill, Sand with Shells	5-15	11.38	1.38
	RPMW-14I	Sand with Shells	35-45	12.04	-27.96
	RPMW-14D	Sand with Shells	66-76	12.41	-58.59
	RPMW-14D2	Sand with Silt lenses	95-105	11.97	-88.03
Well Cluster:	PZ-03	Fill, Sand with Shells	2-12	7.03	0.03
	RPMW-15I	Sand with Shells	35-45	10.22	-29.78
	RPMW-15D	Sand with Shells	65-75	9.95	-60.05
Well Cluster:	RPMW-16S	Fill, Sand with Shells	4-14	7.59	-1.41
	RPMW-16I	Sand with Shells	35-45	7.34	-32.66
Well Cluster:	RPMW-17S	Fill, Sand with Shells	5-15	7.45	-2.55
	RPMW-17I	Sand with Shells	35-45	7.59	-32.41
	RPMW-17D	Sand with Shells*	65-75	7.57	-62.43
Well Cluster:	MW-A	Fill	6-16	9.05	-1.95
	RPMW-18I	Sand with Shells	35-45	9.28	-30.72
	RPMW-18D	Sand with Silt lenses	85-95	9.27	-80.73

Table 2-2
Monitoring Well Construction Data
Rockaway Park Former MGP

Well Data	Well ID	Lithology of Screened Interval	Screened Interval (feet below ground surface)	Top of Casing Elevation (feet above msl)	Elevation of Center of Well Screen (feet, MSL)
Shallow Well	MW-01	Fill, Sand with Shells	6-16	8.53	-2.47
Shallow Well	MW-02	Fill, Sand with Shells	5-15	7.43	-2.57
Shallow Well	MW-03	Fill	4-14	7.01	-1.99
Piezometer	PZ-01	Fill	2-12	7.57	0.57
Piezometer	PZ-02	Fill	2-12	8.25	1.25
Piezometer	PZ-04	Fill	2-12	9.66	2.66
Piezometer	PZ-05	Fill	2-12	9.76	2.76
Piezometer	PZ-06	Fill	2-12	9.37	2.37
Piezometer	PZ-07	Fill	2-12	7.68	0.68

Notes:
All wells were constructed using 2-inch PVC Casing threaded to 2-inch Schedule 40 PVC riser.
MW-16S and MW-16I were replaced in October 2002 to replace the RPMW-16 well cluster destroyed during construction.
* - Lithology is assumed based on nearby borings, observations of soil encountered in this interval were not described.

Table 2-1 (continued)
Sample Collection Rationale
Rockaway Park Former MGP Site

Investigation Method/Technology	Sample Point ID	Maximum Drilled Depth (ft)	No. of Samples Selected for Analysis	Analysis					Sample Point Objectives/Comments
				BTEX [1]	PAHs [2]	Total CN [3]	BTEX and PAH by SPLP [4]	Field Parameters [5]	
Bulkhead Area									
Rotosonic Soil Borings	RPSB-130	97	3	X	X	X	X	--	Contingent boring to evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil to the northeast of the Rockaway Park Site based on the results of borings RPSB-125 and RPMW-18D
Monitoring Well Installation and Sampling	RPMW-02D2	107	3/1*	X	X	X/--*	--	--/X*	Contingent monitoring well to evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soils and monitor zones of identified NAPL based on the results of RPSB-118, RPSB-120, RPSB-121, RPSB-122 and RPSB-119.
South and East Adjacent Areas									
Rotosonic Soil Borings	RPSB-127	67	3	X	X	X	X	--	Evaluate the vertical and horizontal extent of BTEX/PAHs and NAPL in subsurface soil to the east of the Rockaway Park Site.
Monitoring Well Installation and Sampling	RPMW-16S	17	1	X	X	X	--	X	Replaced well destroyed during construction activities. Determine groundwater quality south of the Rockaway Park Site to assess background conditions.
	RPMW-16I	47	2/1*	X	X	X	--	X	Replaced well destroyed during construction activities. Determine groundwater quality south of the Rockaway Park Site to assess background conditions.
Groundwater Probes	RPGP-25	75	5	X	X	--	--	--	Determine groundwater quality southeast of the Rockaway Park Site.
	RPGP-26	75	3/1*	X	X	--	--	--	Determine groundwater quality southeast of the Rockaway Park Site.
	RPGP-27	75	2/5*	X	X	--	--	--	Determine groundwater quality east of the Rockaway Park Site.
South and West Adjacent Areas									
Groundwater Probes	RPGP-28A	75	5/3*	X	X	--	--	X	Determine groundwater quality west of the Rockaway Park Site based on elevated BTEX observed in RPMW-08S.
Jamaica Bay Sediment Investigation									
VibraCore Sediment Samples	RPSED02-1	3	2	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-2	3	2	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-3	3	2	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-4	3	2	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-5	3	2	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-6	3	2	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-7	3	5	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-8	3	2	X	X	X	--	--	Evaluate sediment quality.
	RPSED02-9	3	2	X	X	X	--	--	Evaluate sediment quality.
Shipex Background Samples	RPSEDBG-A	0.5	2	X	X	X	--	--	Evaluate sediment quality.
	RPSEDBG-B	0.5	2	X	X	X	--	--	Evaluate sediment quality.
	RPSEDBG-C	0.5	2	X	X	X	--	--	Evaluate sediment quality.
	RPSEDBG-D	0.5	2	X	X	X	--	--	Evaluate sediment quality.
	RPSEDBG-E	0.5	2	X	X	X	--	--	Evaluate sediment quality.
	RPSEDBG-F	0.5	2	X	X	X	--	--	Evaluate sediment quality.
	RPSEDBG-G	0.5	2	X	X	X	--	--	Evaluate sediment quality.
	RPSEDBG-H	0.5	2	X	X	X	--	--	Evaluate sediment quality.

[1] BTEX via USEPA Method 8021.

[2] PAHs via USEPA Method 8270.

[3] Total CN via USEPA Method 9012.

[4] Sample extract resulting from the Synthetic Precipitation Leaching Procedure (SPLP) will be analyzed for BTEX and PAHs.

[5] Field Parameters (collected for groundwater only) include Temperature, pH, Conductivity, Dissolved Oxygen and Oxidation-Reduction Potential.

* Soil and Groundwater samples collected at sample point. Samples and Analysis are listed "Number of Soil Samples/Number of Groundwater Samples"

Table 2-3
Groundwater Depth and Elevations
Rockaway Park Former MGP Site

Well ID	Top of Casing Elevation (feet above msl)	September 16, 2002			
		Tidal Stage	Depth to Water (ft)	Depth to LNAPL (ft)	Water Elevation (feet above msl)
MW-01	8.53	High	6.77	--	1.76
	8.53	Low	7.12	--	1.41
MW-02	NM	High	5.45	--	NA
	NM	Low	5.9	--	NA
MW-03	7.01	High	4.79	--	2.22
	7.01	Low	5.42	--	1.59
MW-A	9.05	High	7.08	--	1.97
	9.05	Low	7.56	--	1.49
PZ-01	7.57	High	Missing	--	NA
	7.57	Low	Missing	--	NA
PZ-02	8.25	High	6.26	--	1.99
	8.25	Low	6.68	--	1.57
PZ-03	7.03	High	4.82	--	2.21
	7.03	Low	5.2	--	1.83
PZ-04	9.66	High	7.16	--	2.5
	9.66	Low	7.57	--	2.09
PZ-05	9.76	High	6.91	--	2.85
	9.76	Low	7.47	--	2.29
PZ-06	9.37	High	6.83	--	2.54
	9.37	Low	7.27	--	2.1
PZ-07	7.68	High	Destroyed	--	NA
	7.68	Low	Destroyed	--	NA
PZ-08	7.18	High	5.00	4.42	2.70[1]
	7.18	Low	5.26	4.90	2.24[1]
RPMW-01S	8.24	High	5.84	--	2.4
	8.24	Low	7.53	--	0.71
RPMW-01I	8.06	High	4.73	--	3.33
	8.06	Low	7.49	--	0.57
RPMW-02S	11.17	High	9.68	--	1.49
	11.17	Low	9.95	--	1.22
RPMW-02I	10.94	High	7.75	--	3.19
	10.94	Low	10.66	--	0.28
RPMW-02D	11.09	High	8.18	--	2.91
	11.09	Low	11.16	--	-0.07
RPMW-02D2	11.26	High	7.6	--	3.66
	11.26	Low	10.47	--	0.79
RPMW-03S	7.13	High	5.86	--	1.27
	7.13	Low	6.38	--	0.75
RPMW-03I	7.32	High	4.74	--	2.58
	7.32	Low	6.92	--	0.4
RPMW-03D	8.03	High	5.23	--	2.8
	8.03	Low	7.58	--	0.45
RPMW-04S	11.48	High	8.98	--	2.5
	11.48	Low	9.73	--	1.75

Table 2-3
Groundwater Depth and Elevations
Rockaway Park Former MGP Site

Well ID	Top of Casing Elevation (feet above msl)	September 16, 2002			
		Tidal Stage	Depth to Water (ft)	Depth to LNAPL (ft)	Water Elevation (feet above msl)
RPMW-04I	10.7	High	8.67	--	2.03
	10.7	Low	10.37	--	0.33
RPMW-05S	11.3	High	9.49	--	1.81
	11.3	Low	9.56	--	1.74
RPMW-05I	11.7	High	8.5	--	3.2
	11.7	Low	10.74	--	0.96
RPMW-06I	12.49	High	9.77	--	2.72
	12.49	Low	11.23	--	1.26
RPMW-07S	7.89	High	5.58	--	2.31
	7.89	Low	6.2	--	1.69
RPMW-07I	7.86	High	5.08	--	2.78
	7.86	Low	6.58	--	1.28
RPMW-07D	7.82	High	5.68	--	2.14
	7.82	Low	7.27	--	0.55
RPMW-07D2	7.75	High	5	--	2.75
	7.75	Low	6.73	--	1.02
RPMW-08S	11.84	High	9.36	--	2.48
	11.84	Low	9.9	--	1.94
RPMW-08I	11.79	High	9.07	--	2.72
	11.79	Low	9.94	--	1.85
RPMW-08D	11.25	High	8.91	--	2.34
	11.25	Low	9.93	--	1.32
RPMW-08D2	10.81	High	8.52	--	2.29
	10.81	Low	9.75	--	1.06
RPMW-09I	10.16	High	7.3	--	2.86
	10.16	Low	8.42	--	1.74
RPMW-09D	10.08	High	8	--	2.08
	10.08	Low	9.16	--	0.92
RPMW-09D2	10.2	High	8.23	--	1.97
	10.2	Low	9.5	--	0.7
RPMW-10S	11.14	High	9.21	--	1.93
	11.14	Low	9.46	--	1.68
RPMW-10I	11.18	High	8.98	--	2.2
	11.18	Low	9.87	--	1.31
RPMW-11S	9.63	High	7.70	7.60	2.02[1]
	9.63	Low	8.80	--	0.83
RPMW-11I	9.65	High	6.25	--	3.4
	9.65	Low	9.3	--	0.35
RPMW-11D	9.57	High	6.9	--	2.67
	9.57	Low	9.86	--	-0.29
RPMW-12S	13.46	High	10.81	--	2.65
	13.46	Low	11.22	--	2.24
RPMW-12I	13.34	High	10.64	--	2.7
	13.34	Low	11.2	--	2.14

Table 2-3
Groundwater Depth and Elevations
Rockaway Park Former MGP Site

Well ID	Top of Casing Elevation (feet above msl)	September 16, 2002			
		Tidal Stage	Depth to Water (ft)	Depth to LNAPL (ft)	Water Elevation (feet above msl)
RPMW-12D	12.71	High	10.71	--	2
	12.71	Low	11.37	--	1.34
RPMW-12D2	12.81	High	11.07	--	1.74
	12.81	Low	11.87	--	0.94
RPMW-13S	13.78	High	11.14	--	2.64
	13.78	Low	11.6	--	2.18
RPMW-13I	13.96	High	11.22	--	2.74
	13.96	Low	11.81	--	2.15
RPMW-13D	14.1	High	12.01	--	2.09
	14.1	Low	12.61	--	1.49
RPMW-13D2	14.2	High	12.26	--	1.94
	14.2	Low	13.11	--	1.09
RPMW-14S	11.38	High	8.91	--	2.47
	11.38	Low	9.28	--	2.1
RPMW-14I	12.04	High	9.5	--	2.54
	12.04	Low	10	--	2.04
RPMW-14D	12.41	High	10.6	--	1.81
	12.41	Low	11.12	--	1.29
RPMW-14D2	11.97	High	9.58	--	2.39
	11.97	Low	10.22	--	1.75
RPMW-15I	10.22	High	7.93	--	2.29
	10.22	Low	8.46	--	1.76
RPMW-15D	9.95	High	8.35	--	1.6
	9.95	Low	8.91	--	1.04
RPMW-16S	8.29	High	Replaced	--	NM
	8.29	Low	Replaced	--	NM
RPMW-16I	8.34	High	Replaced	--	NM
	8.34	Low	Replaced	--	NM
RPMW-17S	7.45	High	NM	--	NC
	7.45	Low	NM	--	NC
RPMW-17I	7.59	High	NM	--	NC
	7.59	Low	NM	--	NC
RPMW-17D	7.57	High	NM	--	NC
	7.57	Low	NM	--	NC
RPMW-18I	9.28	High	6.65	--	2.63
	9.28	Low	8.13	--	1.15
RPMW-18D	9.27	High	6.57	--	2.7
	9.27	Low	8.23	--	1.04
Bulkhead	7.26	High	3.75	--	3.51
	7.26	Low	8.55	--	-1.29

Notes:
[1] - Corrected groundwater elevation calculated by (TOC-DTW)+((DTW-DTP)*0.85)
NM - not measured
NC - not calculated

Table 2-4
Final Groundwater Parameters
Rockaway Park Former MGP

Sample Location/Well ID	Date	Flow Rate (ml/min)	Depth to Water (ft)	Parameters								
				pH (std units)	Turbidity (NTU)	Temperature (C)	Dissolved Oxygen (mg/l)	ORP (mV)	Conductivity (umhos/cm)	TDS (ppt)	Salinity (ppt)	Ferrous Iron (mg/l)
RPMW05S	9/17/2002	300	9.5	6.56	1.8	20.08	1.71	-188.4	0.645	0.482	0.36	NM
RPMW05I	9/17/2002	500	10.68	7.58	0	16.42	2	-253	1.923	0.658	0.5	NM
RPMW08S	9/17/2002	500	9.94	6.66	0.31	20	4.64	165.4	0.377	0.369	0.28	NM
RPMW08I	9/17/2002	500	9.4	7.75	0.33	16.67	1.41	-156.3	0.822	0.368	0.28	NM
PZ-06	9/17/2002	400	7.05	4.9	0.29	19.69	0.53	283.1	0.652	0.638	0.415	NM
RPMW14S	9/18/2002	240	9.18	6.4	-140.4	19.58	0.35	-122.8	0.572	0.559	0.42	NM
RPMW14I	9/18/2002	240	9.96	7.47	-117.9	16.88	0.49	-149	1.007	0.894	0.69	NM
RPWM14D	9/18/2002	300	11.02	7.73	-140.4	16.07	0.47	-96	31.48	27.46	22.85	NM
RPWM14D2	9/18/2002	240	9.76	7.9	4.98	16.57	0.49	-304.5	34.43	8.576	7.62	NM
RPMW18I	9/18/2002	400	8.13	7.22	0.3	17.05	0.81	-331.1	13.81	0.51	0.47	NM
MW-01	9/18/2002	300	7.02	6.83	0.12	19.18	0.45	-166.2	0.858	0.611	0.47	NM
MW-02	9/18/2002	350	5.8	6.91	1.27	20.05	0.24	-181	0.483	0.394	0.3	NM
MW-03	9/18/2002	400	4.7	6.29	5.67	19.12	0.37	-95.3	0.442	0.191	0.14	NM
RPMW08D2	9/18/2002	500	9.75	7.82	4.73	15.68	0.43	-412.1	69.64	12.12	11.11	NM
RPMW08D	9/18/2002	500	9.93	8.03	5.22	16.83	0.73	-500.1	33.72	12.12	11.11	NM
RPMW13S	9/18/2002	250	11.2	6.42	5.01	20.36	11.07	-189.2	0.805	0.777	0.6	NM
RPMW13D	9/18/2002	200	12.61	7.82	10.69	18.85	2.15	-189.7	29.02	16.32	15.35	NM
RPMW13D2	9/18/2002	300	7.77	0.57	16	47	0.61	-102.8	34.47	22.47	21.79	NM
RPMW13I	9/18/2002	300	11.62	8.04	0.26	19.27	2.14	-155	0.667	0.327	0.22	NM
RPMW11I	9/19/2002	300	6.15	9.22	0.2	16.93	-0.79	-277.1	21.39	1.605	1.28	NM
RPMW18D	9/19/2002	400	8.23	7.67	0.55	16.07	1.97	-147.7	43.87	24.62	24.07	NM
PZ-02	9/19/2002	250	6.68	6.51	0.51	19.47	0.44	-95.8	0.653	0.612	0.46	NM
RPMW12S	9/19/2002	275	10.77	3.38	5.14	20.45	3.52	85.1	1.365	0.892	0.69	NM
RPMW12I	9/19/2002	250	10.74	7.45	0.02	17.7	0.97	-96.3	0.864	0.472	0.36	NM
RPMW12D	9/19/2002	200	11.13	7.86	5.51	18.48	0.6	-98.5	29.25	17.71	16.77	1.8
RPMW11D	9/19/2002	300	7.85	8.13	1.29	16.14	0.31	-223.6	48.18	27.34	27.62	NM
MW-A	9/19/2002	250	7.56	6.83	0.2	19.44	0.39	-106.4	0.625	0.51	0.47	4.0
RPMW02D2	9/19/2002	250	9.65	8.08	4.01	16.97	0.49	-245.6	47.75	26.82	26.42	NM
RPMW-17I	9/19/2002	300	5.78	8.08	6.29	17.61	0.38	-196.4	24.77	7.121	6.24	NM
RPMW-17D	9/19/2002	300	5.77	8.03	0.2	16.79	0.84	-213.8	44.09	16.55	15.57	NM
RPMW-17S	9/19/2002	300	5.98	8.04	0.81	21.86	0.74	-220.8	6.798	5.15	4.41	NM
RPMW12D2	9/19/2002	250	11.83	7.64	1.4	16.92	0.7	-60.5	35.32	23.34	22.73	1.4
RPMW06I	9/19/2002	250	11.14	7.12	1.13	16.45	-1.16	-308.4	13.7	12.74	11.71	0
PZ-05	9/20/2002	300	7.73	6.61	7.32	20.04	0.62	-126.5	0.737	0.502	0.38	NM
RPMW04I	9/20/2002	300	9.07	8.07	0.61	17.57	3.4	-138.7	2.311	0.969	0.75	NM
RPMW04S	9/20/2002	250	8.95	6.56	6.59	19.63	1.79	24.2	1.212	1.053	0.82	NM

Table 2-4
Final Groundwater Parameters
Rockaway Park Former MGP

Sample Location/Well ID	Date	Flow Rate (ml/min)	Depth to Water (ft)	Parameters								
				pH (std units)	Turbidity (NTU)	Temperature (C)	Dissolved Oxygen (mg/l)	ORP (mV)	Conductivity (umhos/cm)	TDS (ppt)	Salinity (ppt)	Ferrous Iron (mg/l)
RPMW01S	9/20/2002	300	5.62	6.88	0.1	22.63	4.71	205.6	38.67	24.91	24.43	NM
RPMW01I	9/20/2002	300	5.61	7.81	0.56	17.48	0.56	-150.1	10.38	8.975	8.02	NM
RPMW15I	9/20/2002	400	7.95	7.56	3.09	17.31	2.55	-91.2	15.47	NM	NM	1.6
PZ-04	9/20/2002	200	7.28	6.17	4.31	20.74	2.32	-174.3	0.644	0.489	0.37	NM
RPMW03S	9/20/2002	300	5.66	7.4	0.26	24.33	0.66	-112.7	3.367	5.424	4.7	NM
RPMW02I	9/23/2002	300	11	7.18	1.2	16.72	-3.23	-286.3	18.1	11.11	10.69	0
RPMW03I	9/23/2002	350	4.45	7.27	0.75	18.23	-1.21	-351.1	33.3	21.65	20.97	NM
RPMW03D	9/23/2002	250	5.3	7.82	0.75	18.82	0.85	-177.1	42.33	27.54	27.23	NM
RPMW09I	9/23/2002	200	7.48	7.71	3.7	18.5	2.21	-309.4	1.264	0.82	0.63	0
RPMW09D	9/23/2002	250	8.65	7.86	7.71	18.35	1.49	-291.9	38.17	24.77	24.25	0.2
RPMW09D2	9/23/2002	250	9.43	7.67	8.41	17.82	0.76	-188.2	41.92	27.25	26.99	1.4
PZ-03	9/23/2002	250	4.79	6.41	2.56	19.69	0.54	-115.7	0.794	0.518	0.39	2.4
RPMW15D	9/23/2002	400	8.17	8.01	5.34	16.27	0.98	-19.93	10.3	26.2	25.8	NM
RPMW07D2	9/24/2002	350	5.37	7.88	14.1	16.26	0.61	-212.2	42.13	27.48	27.23	NM
RPMW07D	9/24/2002	350	5.67	7.67	1	15.68	0.95	-492.1	41.84	27.19	22.88	3.2
RPMW07I	9/24/2002	325	4.93	7.2	5.45	16.61	-0.35	-371.6	4.328	2.804	2.31	0
RPMW07S	9/24/2002	250	5.57	6.62	6.45	19.5	0.02	-303.1	0.776	0.505	0.38	0.4
RPMW02S	9/24/2002	300	9.79	6.93	1.1	20.71	0.28	-227.3	1.505	0.98	0.76	0.2
RPMW02D	9/24/2002	300	8	7.84	1.2	17.82	1.6	-159.1	40.26	26.16	25.77	4.7
RPMW10S	9/24/2002	300	9.12	6.19	0.8	19.87	1.56	-5.8	0.53	0.34	0.25	5.2
RPMW10I	9/24/2002	300	9.51	7.13	0.85	17.34	0.8	334.1	20.61	13.33	12.31	1.6
RPMW16I	11/7/2002	400	4.54	7.89	4	15.83	0.12	-101.8	1.759	NM	NM	0.2
RPMW16S	11/7/2002	400	4.75	7.74	1	17.62	0.2	-120.2	0.797	NM	NM	0.2

Notes:
ml/min = milliliters per minute
NTU = nephelometric tubidity units
C = degrees Celsius
mg/l = milligrams per liter
mV = millivolts
umhos/cm = micro-ohms per centimeter
ppt = parts per thousand

Table 2-4
Final Groundwater Parameters
Rockaway Park Former MGP

Sample Location/Well ID	Date	Flow Rate (ml/min)	Depth to Water (ft)	Observations			
				Odor	Color	Sheen	Comments
RPMW05S	9/17/2002	300	9.5	naphthalene odor	clear	none	
RPMW05I	9/17/2002	500	10.68	naphthalene odor	clear	none	
RPMW08S	9/17/2002	500	9.94	none	clear	none	
RPMW08I	9/17/2002	500	9.4	slight naphthalene odor	yellow tint	none	
PZ-06	9/17/2002	400	7.05	slight naphthalene odor	clear	none	
RPMW14S	9/18/2002	240	9.18	slight odor (unknown)	rusty	slight sheen	
RPMW14I	9/18/2002	240	9.96	none	clear	none	
RPWM14D	9/18/2002	300	11.02	none	clear	none	
RPWM14D2	9/18/2002	240	9.76	none	slightly turbid	none	
RPMW18I	9/18/2002	400	8.13	slight naphthalene odor	yellow tint	none	
MW-01	9/18/2002	300	7.02	none	yellow tint	none	
MW-02	9/18/2002	350	5.8	naphthalene-like odor	yellow tint	none	
MW-03	9/18/2002	400	4.7	slight naphthalene odor	yellow tint	slight broken sheen	
RPMW08D2	9/18/2002	500	9.75	none	clear	none	
RPMW08D	9/18/2002	500	9.93	none	yellow tint	none	
RPMW13S	9/18/2002	250	11.2	slight naphthalene odor	cloudy	none	
RPMW13D	9/18/2002	200	12.61	naphthalene odor	cloudy	none	
RPMW13D2	9/18/2002	300	7.77	naphthalene odor	clear	none	
RPMW13I	9/18/2002	300	11.62	slight naphthalene and gasoline odor	clear	none	
RPMW11I	9/19/2002	300	6.15	strong DNAPL (tar)-like odor	clear	none	
RPMW18D	9/19/2002	400	8.23	none	clear	none	
PZ-02	9/19/2002	250	6.68	slight naphthalene odor	yellow tint	none	
RPMW12S	9/19/2002	275	10.77	naphthalene odor	clear	none	
RPMW12I	9/19/2002	250	10.74	naphthalene and gasoline odor	clear	none	
RPMW12D	9/19/2002	200	11.13	none	light tan	none	
RPMW11D	9/19/2002	300	7.85	DNAPL (tar)-like odor	clear	none	
MW-A	9/19/2002	250	7.56	none	yellow tint	none	
RPMW02D2	9/19/2002	250	9.65	none	rusty	none	
RPMW-17I	9/19/2002	300	5.78	slight DNAPL (tar)-like odor	turbid	none	
RPMW-17D	9/19/2002	300	5.77	slight naphthalene odor	clear	none	
RPMW-17S	9/19/2002	300	5.98	slight DNAPL (tar)-like odor	clear	none	
RPMW12D2	9/19/2002	250	11.83	none	clear	none	
RPMW06I	9/19/2002	250	11.14	slight naphthalene odor	clear	none	
PZ-05	9/20/2002	300	7.73	naphthalene and diesel odor	clear	slight sheen	
RPMW04I	9/20/2002	300	9.07	very slight naphthalene odor	clear	none	
RPMW04S	9/20/2002	250	8.95	none	orange-clear	none	

Table 2-4
Final Groundwater Parameters
Rockaway Park Former MGP

Sample Location/Well ID	Date	Flow Rate (ml/min)	Depth to Water (ft)	Observations			
				Odor	Color	Sheen	Comments
RPMW01S	9/20/2002	300	5.62	none	slight rust color	none	
RPMW01I	9/20/2002	300	5.61	none	clear	none	
RPMW15I	9/20/2002	400	7.95	none	clear	none	
PZ-04	9/20/2002	200	7.28	slight naphthalene odor	yellow-clear	none	
RPMW03S	9/20/2002	300	5.66	none	clear	none	
RPMW02I	9/23/2002	300	11	slight naphthalene and sewer odor	clear	none	
RPMW03I	9/23/2002	350	4.45	sulphur and sewer odor	clear	none	
RPMW03D	9/23/2002	250	5.3	none	clear	none	
RPMW09I	9/23/2002	200	7.48	coal-tar like odor	gray	none	coal-tar staining on tubing/bailers
RPMW09D	9/23/2002	250	8.65	coal-tar like odor	gray	none	coal-tar staining on tubing/bailers
RPMW09D2	9/23/2002	250	9.43	coal-tar like odor	dark gray	none	coal-tar staining on tubing/bailers
PZ-03	9/23/2002	250	4.79	none	light brown	colorless sheen	
RPMW15D	9/23/2002	400	8.17	none	light brown	none	
RPMW07D2	9/24/2002	350	5.37	slight coal-tar like odor	light gray - clear	none	
RPMW07D	9/24/2002	350	5.67	coal-tar like odor	dark gray	none	
RPMW07I	9/24/2002	325	4.93	coal-tar like odor	light gray	none	
RPMW07S	9/24/2002	250	5.57	none	tan-clear	none	
RPMW02S	9/24/2002	300	9.79	slight naphthalene and gasoline odor	clear	none	
RPMW02D	9/24/2002	300	8	naphthalene odor	clear	none	
RPMW10S	9/24/2002	300	9.12	naphthalene odor	cloudy	none	
RPMW10I	9/24/2002	300	9.51	slight naphthalene odor	clear	none	
RPMW16I	11/7/2002	400	4.54	none	clear	none	
RPMW16S	11/7/2002	400	4.75	none	clear	none	

Notes:
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NTU = nephelometric tubidity units
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mg/l = milligrams per liter
mV = millivolts
umhos/cm = micro-ohms per centimeter
ppt = parts per thousand

Table 3-1
Hydraulic Conductivity Values (K)
Rockaway Park Former MGP Site

Well	Lithology of Screened Interval	Site-Specific Calculated Hydraulic Conductivity Values		Standard K values for Similar Geologic Materials (cm/sec) (after Freeze and Cherry, 1979)
		K (ft/day)	K (cm/sec)	
Rising Head Hydraulic Conductivity Test Results (Bouwer & Rice Method) [(a)]				
Shallow Interval				
RPMW02S	Fill and Sand with Shells	22.0	7.8E-03	1 to 1E-03
RPMW10S	Fill and Sand with Shells	9.0	3.2E-03	1 to 1E-03
RPMW12S	Fill and Sand with Shells	28.9	1.0E-02	1 to 1E-03
Intermediate Interval				
RPMW02I	Sand with Shells	45.8	1.6E-02	1 to 1E-03
RPMW10I	Sand with Shells	53.6	1.9E-02	1 to 1E-03
RPMW12I	Sand with Shells	21.0	7.4E-03	1 to 1E-03
Deep Interval				
RPMW02D	Sand with Shells	65.8	2.3E-02	1 to 1E-03
RPMW12D	Sand with Shells	12.6	4.5E-03	1 to 1E-03
Deep(2) Interval				
RPMW02D2	Sand with Silt lenses	28.5	1.00E-04	1E-01 to 1E-05
RPMW12D2	Sand with Silt lenses and Shells	9.8	3.5E-03	1E-01 to 1E-05

Notes:

(a) Aquifer Test Toolbox Version 2C
Aquifer Test Software for Scientists and Engineering for Microsoft Excel Version 5.0
by Creative Scientific Applications, July 15, 1999

Table 3-2
Vertical Hydraulic Head Differential
and Gradients Within the Water Table Aquifer

Well Pair	Linear Distance Between Center of Screens (dl)	Vertical Head Differential [(a)]		Vertical Gradient i_v [(b)]		Direction of Vertical Head Potential	
		Low Tide	High Tide	Low Tide	High Tide	Low Tide	High Tide
Shallow to Intermediate							
RPMW01S & RPMW01I	30	0.14	-0.93	0.005	-0.031	D	U
RPMW02S & RPMW02I	30	0.94	-1.7	0.031	-0.057	D	U
RPMW03S & RPMW03I	30	0.35	-1.35	0.012	-0.045	D	U
RPMW04S & RPMW04I	30	1.42	0.47	0.047	0.016	D	D
RPMW05S & RPMW051I	30	0.78	-1.39	0.026	-0.046	D	U
RPMW07S & RPMW07I	46.5	0.41	-0.47	0.012	-0.014	D	U
RPMW08S & RPMW08I	30	0.09	-0.24	0.003	-0.008	D	U
RPMW010S & RPMW010I	30	0.37	-0.27	0.012	-0.009	D	U
RPMW011S & RPMW011I	30	0.48	-1.38	0.016	-0.046	D	U
RPMW012S & RPMW012I	30	0.1	-0.05	0.003	-0.002	D	U
RPMW013S & RPMW013I	30	0.03	-0.1	0.001	-0.003	D	U
RPMW014S & RPMW014I	30	0.06	-0.07	0.002	-0.002	D	U
Intermediate to Deep							
RPMW02I & RPMW02D	29	0.35	0.28	0.012	0.009	D	D
RPMW03I & RPMW03D	30	-0.05	-0.22	-0.002	-0.007	U	U
RPMW07I & RPMW07D	30	0.73	0.64	0.024	0.021	D	D
RPMW08I & RPMW08D	31	0.53	0.38	0.02	0.013	D	D
RPMW09I & RPMW09D	31	0.82	0.78	0.027	0.023	D	D
RPMW011I & RPMW011D	30	0.64	0.73	0.021	0.024	D	D
RPMW012I & RPMW012D	30	0.8	0.7	0.027	0.023	D	D
RPMW013I & RPMW013D	30	0.66	0.65	0.022	0.022	D	D
RPMW014I & RPMW014D	31	0.5	0.73	0.018	0.018	D	D
RPMW015I & RPMW015D	30	0.72	0.69	0.024	0.023	D	D
RPMW018I & RPMW018D	50	0.11	-0.07	0.002	-0.001	D	U
Deep to Deep (2)							
RPMW02D & RPMW02D2	31	0.69	0.58	0.022	0.019	D	D
RPMW07D & RPMW07D2	30	-0.47	-0.61	-0.016	-0.02	U	U
RPMW08D & RPMW08D2	30	0.26	0.05	0.009	0.001	D	D
RPMW09D & RPMW09D2	29	0.22	0.11	0.007	0.004	D	D
RPMW012D & RPMW012D2	30	0.4	0.26	0.013	0.009	D	D
RPMW013D & RPMW013D2	30	0.4	0.15	0.013	0.005	D	D
RPMW014D & RPMW014D2	35	-0.46	-0.58	-0.013	-0.017	U	U

General notes:

1. dh = change in head between 2 wells (ft)
2. dl = linear distance between centers of two well screens (ft)
3. MSL = mean sea level
4. D = downward
5. U = upward
6. Measurements obtained on September 16, 2002

(a) dh = Groundwater elevation of shallow well - groundwater elevation of deep well
(b) i_v = dh/dl

Table 4-1
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date						
		PZ-01	PZ-08	RPCP-01	RPCP-02	RPCP-05	RPCP-06	RPCP-07
		5.00	5.00	0.00	0.00	0.00	0.00	0.00
		RP-SB01-01	RPSB-02-01	RPCP-01	RPCP-02	RPCP-05	RPCP-06	RPCP-07
		10/24/1995	10/24/1995	01/12/1999	01/13/1999	01/19/1999	01/20/1999	01/22/1999
Volatile Organic Compounds (VOCs)								
BTEX (mg/kg)								
Benzene	0.06	**1.79**	**37**	0.007	0.001 U	**0.5**	0.001 U	0.001 U
Ethyl benzene	5.5	0.52	**290**	0.002	0.001	**8.6**	0.001 U	0.001 U
Toluene	1.5	**1.9**	**130**	0.015	0.001 U	0.32	0.001 U	0.001 U
Xylene (total)	1.2	0.5	**630**	0.01	0.002	**8.3**	0.001 U	0.001 U
Total BTEX		4.71	1087	0.034	0.003	17.72	0	0
Other Volatile Organic Compounds (ug/kg)								
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	20000 U	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	20000 U	NA	NA	NA	NA	NA
Acetone	200	NA	**20000 J**	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	290 U	199	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	10000 U	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	10000 U	NA	NA	NA	NA	NA
Methylene chloride	100	NA	10000 U	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA	NA
Styrene	NE	10400	10000 U	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	10000 U	NA	NA	NA	NA	NA
Trichloroethene	700	NA	10000 U	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)								
Carcinogenic PAHs (mg/kg)								
Benzo(a)anthracene	0.224	**38.7**	**61 JD**	**60**	**0.66**	**84 J**	**11**	**10**
Benzo(a)pyrene	0.061	**51.2**	**46 JD**	**66**	**0.52**	**68 J**	**7.2 J**	**8.2**
Benzo(b)fluoranthene	1.1	0.20 U	**21 JD**	**51**	**1.8**	**40 J**	**7.2 J**	**5**
Benzo(k)fluoranthene	1.1	**65.2 C**	**37 JD**	**74**	**2**	**75 J**	**14**	**8.2**
Chrysene	0.4	**37.1**	**65 JD**	**73**	**1.3**	**110**	**14**	**12**
Dibenzo(a,h)anthracene	0.014	**2.22**	**5.64**	**12 J**	**0.15 J**	**16 J**	**2.2 J**	**3.5 J**
Indeno(1,2,3-cd)pyrene	3.2	**22.1**	**16.9**	**20 J**	0.31 J	**32 J**	**4.4 J**	**6.9**
Total Carcinogenic PAHs		216.52	252.54	356	6.74	425	60	53.8
Non-Carcinogenic PAHs (mg/kg)								
2-Methylnaphthalene	36.4	6.99	**758**	7.2 J	0.37	15 J	0.51 J	0.18 J
Acenaphthene	50	1.92	**195**	2 J	0.057 J	**65 J**	0.21 J	4 U
Acenaphthylene	41	25.0	**353**	**62**	1.5	**44 J**	5.6 J	3.6 J
Anthracene	50	7.87	**110**	31 J	0.44	**74 J**	4.5 J	1.9 J
Benzo(g,h,i)perylene	50	24.8	24 JD	42 U	0.37 U	87 U	7.4 U	7.9
Fluoranthene	50	27.5	**120 D**	**63**	0.72	**150**	14	8.8
Fluorene	50	2.02	**196**	8.6 J	0.061 J	42 J	0.26 J	0.17 J
Naphthalene	13	6.8	**1380**	5.7 J	0.43	**180**	0.66 J	0.14 J
Phenanthrene	50	9.41	**340 D**	26 J	0.82	**240**	13	2.7 J
Pyrene	50	**61.5**	**180**	**210**	1.6	**250**	24	23
Total Non-Carcinogenic PAHs		173.81	3656	415.5	5.998	1060	62.74	48.39
Total PAHs		390.33	3908.54	771.5	12.738	1485	122.74	102.19
Other Semivolatile Organic Compounds (ug/kg)								
1,2-Dichlorobenzene	7900	NA	76000 U	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	3.39	423	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	76000 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	76000 U	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	76000 U	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	76000 U	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	76000 U	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	76000 U	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	76000 U	NA	NA	NA	NA	NA
Carbazole	NE	NA	76000 U	NA	NA	NA	NA	NA
Dibenzofuran	6200	1170	**24200**	NA	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	76000 U	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	76000 U	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	76000 U	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date						
		PZ-01	PZ-08	RPCP-01	RPCP-02	RPCP-05	RPCP-06	RPCP-07
		5.00	5.00	0.00	0.00	0.00	0.00	0.00
		RP-SB01-01	RPSB-02-01	RPCP-01	RPCP-02	RPCP-05	RPCP-06	RPCP-07
		10/24/1995	10/24/1995	01/12/1999	01/13/1999	01/19/1999	01/20/1999	01/22/1999
Metals (mg/kg)								
Aluminum	NE*	NA	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	5.9	2.6	**9.6**	**11.3**	6.4
Barium	300	NA	NA	71.4	12.4 B	116	55.0	76.9
Beryllium	0.16	NA	NA	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	0.52 B	0.22 U	0.62 B	**2.4**	0.18 U
Calcium	NE*	NA	NA	NA	NA	NA	NA	NA
Chromium	10	NA	NA	3.5	2.4	**14.7**	9.0	**12.5**
Cobalt	30	NA	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	804.	26.0	282	291	641
Magnesium	NE*	NA	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	**0.20**	0.051 U	**1.9**	**2.8**	**0.11**
Nickel	13	NA	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA	NA
Selenium	2	NA	NA	1.1 B	0.67 U	1.7	**3.0**	1.2
Silver	NE*	NA	NA	0.26 U	0.22 U	0.34 B	0.22 U	0.18 U
Sodium	NE*	NA	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)								
Cyanide, total	NE	NA	NA	5.77	5.57	0.657 U	9.82	0.591 U
PCBs (ug/kg)								
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)								
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA	NA
TCLP								
TCLP Benzene (ug/l)								
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)								
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)								
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPCP-10	RPMW-08D2	RPSB-09	RPSB-09A		
		0.00	7-10	2-4	1-2	5.5-6.5	8-12
		RPCP-10	RPMW-0802 (7-10)	RPSB-09 (2-4)	RPSB-09A (1-2)	RPSB-09A (5.5-6.5)	RPSB-09A (8-12)
		01/22/1999	08/22/2002	01/07/2000	07/25/2002	07/25/2002	07/25/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.002	0.005	**4.8**	1.7 U	0.063 U	**0.11**
Ethyl benzene	5.5	0.001	0.001 U	**9.4**	**110**	1.6	3.7
Toluene	1.5	0.003	0.001 U	**40**	**2.9**	0.063 U	0.079
Xylene (total)	1.2	0.004	0.001 U	**160**	**37**	0.98	**3.4**
Total BTEX		0.01	0.005	214.2	149.9	2.58	7.289
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**8.3**	0.088 J	**500 DJ**	**960**	**15 J**	**17**
Benzo(a)pyrene	0.061	**7**	**0.065 J**	**340 DJ**	**560 J**	**9.3 J**	**10 J**
Benzo(b)fluoranthene	1.1	**4**	0.068 J	**300 DJ**	**560 J**	**10 J**	**13**
Benzo(k)fluoranthene	1.1	**5.3**	0.42 U	**180 DJ**	**200 J**	21 U	12 U
Chrysene	0.4	**10**	0.1 J	**460 DJ**	**940**	**15 J**	**18**
Dibenzo(a,h)anthracene	0.014	**2.4 J**	0.42 U	**6.8**	580 U	21 U	**1.5 J**
Indeno(1,2,3-cd)pyrene	3.2	**4.3**	0.42 U	**140 DJ**	**250 J**	**4.9 J**	**6.7 J**
Total Carcinogenic PAHs		41.3	0.321	1926.8	3470	54.2	66.2
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.97 J	0.052 J	4.4 U	**4300**	12 J	**42**
Acenaphthene	50	0.17 J	0.42 U	**880 DU**	**340 J**	11 J	6.6 J
Acenaphthylene	41	3.3	0.046 J	**240 DJ**	**780**	6.4 J	11 J
Anthracene	50	2.9 J	0.046 J	**620 DJ**	**1000**	16 J	14
Benzo(g,h,i)perylene	50	4.8	0.42 U	**170 DJ**	**230 J**	5.5 J	7.6 J
Fluoranthene	50	7.5	0.14 J	**1000 D**	**1600**	24	32
Fluorene	50	0.56 J	0.052 J	**950 D**	**1800**	27	23
Naphthalene	13	0.88 J	0.42 U	**9600 D**	**3300**	**250**	**99**
Phenanthrene	50	8.9	0.24 J	**3300 D**	**5900**	**52**	**81**
Pyrene	50	12	0.23 J	**1500 D**	**3100**	47	**56**
Total Non-Carcinogenic PAHs		41.98	0.806	17384.4	22350	450.9	372.2
Total PAHs		83.28	1.127	19311.2	25820	505.1	438.4
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	12000 U	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	420 U	**110000 DJ**	**200000 J**	2500 J	2900 J
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPCP-10	RPMW-08D2	RPSB-09	RPSB-09A		
		0.00	7-10	2-4	1-2	5.5-6.5	8-12
		RPCP-10	RPMW-0802 (7-10)	RPSB-09 (2-4)	RPSB-09A (1-2)	RPSB-09A (5.5-6.5)	RPSB-09A (8-12)
		01/22/1999	08/22/2002	01/07/2000	07/25/2002	07/25/2002	07/25/2002
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	**9.7**	NA	**40**	NA	NA	NA
Barium	300	37.8	NA	43.6	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.18 U	NA	**6.9**	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	5.7	NA	**21.3**	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	107.	NA	173	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	**1.0**	NA	**1.1**	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	1.3	NA	**73**	NA	NA	NA
Silver	NE*	0.18 U	NA	5.9	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	1.51	0.29 U	138	0.41 U	2.3	9.3
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-10	RPSB-118	RPSB-12	RPSB-120	RPSB-121	RPSB-122
		4-6	7-12.5	2-4	7-12	7-8.5	7-11.5
		RPSB-10 (4-6)	RPSB-118 (7-12.5)	RPSB-12 (2-4)	RPSB-120 (7-12)	RPSB-121 (7-8.5)	RPSB-122 (7-11.5)
		12/28/1999	08/16/2002	12/27/1999	08/16/2002	08/15/2002	08/19/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.004	**5**	0.056	**0.4**	**15**	0.62 U
Ethyl benzene	5.5	0.007	**20**	0.002 J	2.2	**150**	**11**
Toluene	1.5	0.02	1.2 U	0.045	0.12	6 U	1.3
Xylene (total)	1.2	0.052	**15**	0.015	0.88	**170**	**120**
Total BTEX		0.083	40	0.118	3.6	335	132.3
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	5 U	NA	NA	NA
2-Butanone	300	NA	NA	5 U	NA	NA	NA
2-Hexanone	NE	NA	NA	5 U	NA	NA	NA
Acetone	200	NA	NA	5 J	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	1 J	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	5 U	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	5 U	NA	NA	NA
Carbon disulfide	2700	NA	NA	5 U	NA	NA	NA
Chlorobenzene	1700	NA	NA	5 U	NA	NA	NA
Methylene chloride	100	NA	NA	5 U	NA	NA	NA
n-Butylbenzene	NE	NA	NA	5 U	NA	NA	NA
n-Propylbenzene	NE	NA	NA	5 U	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	5 U	NA	NA	NA
Styrene	NE	NA	NA	5 U	NA	NA	NA
Tetrachloroethene	1400	NA	NA	2 J	NA	NA	NA
Trichloroethene	700	NA	NA	5 U	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	5 U	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**5.5**	**21**	**3.4**	**42**	**58 J**	**0.3 J**
Benzo(a)pyrene	0.061	**7.2**	**14**	**1.8**	**42**	**50 J**	**0.17 J**
Benzo(b)fluoranthene	1.1	**8**	**16**	**4.1**	**46**	**44 J**	0.29 J
Benzo(k)fluoranthene	1.1	**3 J**	**7.2 J**	**1.3**	**18**	**18 J**	0.13 J
Chrysene	0.4	**6.4**	**22**	**4.3**	**49**	**66 J**	0.32 J
Dibenzo(a,h)anthracene	0.014	**0.99 J**	**1.4 J**	**0.65 J**	**3.6 J**	98 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	**5.3**	**5 J**	2.2	**11 J**	**16 J**	0.085 J
Total Carcinogenic PAHs		36.39	86.6	17.75	211.6	252	1.295
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	20	22	0.43 J	17 U	**430**	4.6
Acenaphthene	50	1.8 J	43	0.7 U	26	**140**	0.095 J
Acenaphthylene	41	6.9	5 J	1	13 J	24 J	0.36 J
Anthracene	50	4.2	27	0.6 J	48	**88 J**	0.23 J
Benzo(g,h,i)perylene	50	5.9	5.7 J	2.4	12 J	20 J	0.096 J
Fluoranthene	50	8.9	47	4.3	**86**	**140**	0.73
Fluorene	50	5.1	39	0.7 U	25	**120**	0.42
Naphthalene	13	**47**	**93**	1.2	7.3 J	**930**	3.5
Phenanthrene	50	16	**110**	3.6	**84**	**330**	1.2
Pyrene	50	23	**83**	7	**130**	**190**	0.94
Total Non-Carcinogenic PAHs		138.8	474.7	20.53	431.3	2412	12.171
Total PAHs		175.19	561.3	38.28	642.9	2664	13.466
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	5 U	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	700 U	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	700 U	NA	NA	NA
2-Methylphenol	1000	NA	NA	700 U	NA	NA	NA
4-Methylphenol	900	NA	NA	700 U	NA	NA	NA
Benzene, hydroxy-	NE	13000 U	NA	700 U	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	700 U	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	700 U	NA	NA	NA
Carbazole	NE	NA	NA	700 U	NA	NA	NA
Dibenzofuran	6200	640 J	4200 J	700 U	3100 J	**13000 J**	65 J
Di-n-butylphthalate	8100	NA	NA	700 U	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	700 U	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	700 U	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-10	RPSB-118	RPSB-12	RPSB-120	RPSB-121	RPSB-122
		4-6	7-12.5	2-4	7-12	7-8.5	7-11.5
		RPSB-10 (4-6)	RPSB-118 (7-12.5)	RPSB-12 (2-4)	RPSB-120 (7-12)	RPSB-121 (7-8.5)	RPSB-122 (7-11.5)
		12/28/1999	08/16/2002	12/27/1999	08/16/2002	08/15/2002	08/19/2002
Metals (mg/kg)							
Aluminum	NE*	NA	NA	1110	NA	NA	NA
Antimony	NE*	NA	NA	0.27 B	NA	NA	NA
Arsenic	7.5	4.5	NA	**7.8**	NA	NA	NA
Barium	300	21.3 B	NA	15.6 B	NA	NA	NA
Beryllium	0.16	NA	NA	0.2 U	NA	NA	NA
Cadmium	1	0.31 B	NA	0.38 B	NA	NA	NA
Calcium	NE*	NA	NA	2440	NA	NA	NA
Chromium	10	7	NA	5.3	NA	NA	NA
Cobalt	30	NA	NA	1.6 B	NA	NA	NA
Copper	25	NA	NA	**26.3**	NA	NA	NA
Iron	2000	NA	NA	**12500**	NA	NA	NA
Lead	NE*	29.9	NA	43.1	NA	NA	NA
Magnesium	NE*	NA	NA	273	NA	NA	NA
Manganese	NE*	NA	NA	51.8	NA	NA	NA
Mercury	0.1	0.036 B	NA	0.055	NA	NA	NA
Nickel	13	NA	NA	3.1 B	NA	NA	NA
Potassium	NE*	NA	NA	226	NA	NA	NA
Selenium	2	0.44 U	NA	0.4 U	NA	NA	NA
Silver	NE*	2.2 B	NA	2.7 B	NA	NA	NA
Sodium	NE*	NA	NA	114	NA	NA	NA
Thallium	NE*	NA	NA	0.3 U	NA	NA	NA
Vanadium	150	NA	NA	3.7 B	NA	NA	NA
Zinc	20	NA	NA	**30.9**	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	2.7	2.2	1.5	1 B	0.28 U	0.29 UJ
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	110	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	36 U	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	36 U	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	3.5 U	NA	NA	NA
4,4'-DDE	2100	NA	NA	3.5 U	NA	NA	NA
4,4'-DDT	2100	NA	NA	3.5 U	NA	NA	NA
Aldrin	2900	NA	NA	1.8 U	NA	NA	NA
alpha-BHC	110	NA	NA	1.8 U	NA	NA	NA
alpha-Chlordane	5400	NA	NA	1.8 U	NA	NA	NA
beta-BHC	200	NA	NA	1.8 U	NA	NA	NA
delta-BHC	300	NA	NA	1.8 U	NA	NA	NA
Dieldrin	44	NA	NA	3.5 U	NA	NA	NA
Endosulfan I	900	NA	NA	1.8 U	NA	NA	NA
Endosulfan II	900	NA	NA	12	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	3.5 U	NA	NA	NA
Endrin	100	NA	NA	3.5 U	NA	NA	NA
Endrin aldehyde	NE	NA	NA	3.5 U	NA	NA	NA
Endrin ketone	NE	NA	NA	11	NA	NA	NA
gamma-Chlordane	540	NA	NA	1.8 U	NA	NA	NA
Heptachlor	100	NA	NA	9	NA	NA	NA
Heptachlor epoxide	20	NA	NA	11	NA	NA	NA
Lindane	NE	NA	NA	1.8 U	NA	NA	NA
Methoxychlor	NE	NA	NA	18 U	NA	NA	NA
Toxaphene	NE	NA	NA	180 U	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-122		RPSB-124	RPSB-15		RPSB-16
		11.5-12	11.5-12 (Dup)	7-13	3-5	7-9	4-6
		RPSB-122 (11.5-12)	RPSBXX081902-1	RPSB-124 (7-13)	RPSB-15 (3-5)	RPSB-15 (7-9)	RPSB-16 (4-6)
		08/19/2002	08/19/2002	08/19/2002	12/15/1999	12/15/1999	12/03/1999
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.057 U	0.006 U	**26**	0.002 J	0.001 U	**0.76**
Ethyl benzene	5.5	5.4	1.3	**43**	0.01	0.004	**6.7**
Toluene	1.5	0.089	0.006 U	0.44 U	0.006	0.003	**1.8**
Xylene (total)	1.2	**8.3**	**3**	**4.2**	0.029	0.016	**16**
Total BTEX		13.789	3.3	73.2	0.047	0.023	25.26
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	6 U	NA	NA
2-Butanone	300	NA	NA	NA	3 J	NA	NA
2-Hexanone	NE	NA	NA	NA	6 U	NA	NA
Acetone	200	NA	NA	NA	20 B	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	12	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	4 J	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	6 U	NA	NA
Carbon disulfide	2700	NA	NA	NA	6 U	NA	NA
Chlorobenzene	1700	NA	NA	NA	6 U	NA	NA
Methylene chloride	100	NA	NA	NA	22	NA	NA
n-Butylbenzene	NE	NA	NA	NA	6 U	NA	NA
n-Propylbenzene	NE	NA	NA	NA	6 U	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	6 U	NA	NA
Styrene	NE	NA	NA	NA	2 J	NA	NA
Tetrachloroethene	1400	NA	NA	NA	2 J	NA	NA
Trichloroethene	700	NA	NA	NA	6 U	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	6 U	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**7.6**	**13**	**22 J**	**0.82**	0.097 J	**240**
Benzo(a)pyrene	0.061	**6.1**	**11 J**	**16 J**	**0.75**	**0.07 J**	**190**
Benzo(b)fluoranthene	1.1	**6.4**	**13 J**	**16 J**	**1.1**	0.1 J	**200**
Benzo(k)fluoranthene	1.1	**2.6**	**5 J**	**6.8 J**	0.41	0.052 J	**75**
Chrysene	0.4	**4.7**	**11**	**27 J**	**0.97**	0.1 J	**210**
Dibenzo(a,h)anthracene	0.014	**0.41 J**	3.9 UJ	39 U	**0.17 J**	0.38 U	**23**
Indeno(1,2,3-cd)pyrene	3.2	1.5 J	2.3 J	**4.8 J**	0.67	0.38 U	**76**
Total Carcinogenic PAHs		29.31	55.3	92.6	4.89	0.419	1014
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	2.1	4.8	**240**	0.22 J	0.38 U	**240**
Acenaphthene	50	4.6	6.6	32 J	0.37 U	0.38 U	**130**
Acenaphthylene	41	1.4 J	1.5 J	39 U	0.81	0.08 J	**630**
Anthracene	50	6.8	17	28 J	0.38	0.38 U	**180**
Benzo(g,h,i)perylene	50	1.4 J	2.2 J	5.6 J	0.77	0.38 U	**71**
Fluoranthene	50	19	30	**56**	0.95	0.1 J	**450 D**
Fluorene	50	4.7	7.6	**54**	0.15 J	0.38 U	**160**
Naphthalene	13	6.4	**33**	**340**	0.32 J	0.38 U	**210**
Phenanthrene	50	26	44	**170**	0.78	0.081 J	**510 D**
Pyrene	50	20	34	**77**	1.8	0.2 J	**580 D**
Total Non-Carcinogenic PAHs		92.4	180.7	1002.6	6.18	0.461	3161
Total PAHs		121.71	236	1095.2	11.07	0.88	4175
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	6 U	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	370 U	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	370 U	NA	NA
2-Methylphenol	1000	NA	NA	NA	370 U	NA	NA
4-Methylphenol	900	NA	NA	NA	370 U	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	370 U	15000 U	15000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	260 J	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	370 U	NA	NA
Carbazole	NE	NA	NA	NA	370 U	NA	NA
Dibenzofuran	6200	2400	3300 J	**14000 J**	370 U	380 U	**15000 J**
Di-n-butylphthalate	8100	NA	NA	NA	370 U	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	370 U	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	370 U	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-122		RPSB-124	RPSB-15		RPSB-16
		11.5-12 RPSB-122 (11.5-12) 08/19/2002	11.5-12 (Dup) RPSBXX081902-1 08/19/2002	7-13 RPSB-124 7-13 08/19/2002	3-5 RPSB-15 (3-5) 12/15/1999	7-9 RPSB-15 (7-9) 12/15/1999	4-6 RPSB-16 (4-6) 12/03/1999
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	1060	NA	NA
Antimony	NE*	NA	NA	NA	0.19 U	NA	NA
Arsenic	7.5	NA	NA	NA	1.6	0.98 B	0.9
Barium	300	NA	NA	NA	25.4	6.8 B	6.2 B
Beryllium	0.16	NA	NA	NA	0.19 U	NA	NA
Cadmium	1	NA	NA	NA	0.51	0.22 B	0.26 B
Calcium	NE*	NA	NA	NA	50200	NA	NA
Chromium	10	NA	NA	NA	2.6	4.2	2.3
Cobalt	30	NA	NA	NA	0.81 B	NA	NA
Copper	25	NA	NA	NA	8.3	NA	NA
Iron	2000	NA	NA	NA	**3740**	NA	NA
Lead	NE*	NA	NA	NA	36.8	11.5	9.3
Magnesium	NE*	NA	NA	NA	1410	NA	NA
Manganese	NE*	NA	NA	NA	27.4	NA	NA
Mercury	0.1	NA	NA	NA	0.05	0.019 U	0.087
Nickel	13	NA	NA	NA	3.5 B	NA	NA
Potassium	NE*	NA	NA	NA	199	NA	NA
Selenium	2	NA	NA	NA	0.37 U	0.42 U	1.5 B
Silver	NE*	NA	NA	NA	0.88 B	0.32 U	0.34 B
Sodium	NE*	NA	NA	NA	776	NA	NA
Thallium	NE*	NA	NA	NA	0.28 U	NA	NA
Vanadium	150	NA	NA	NA	4.2 B	NA	NA
Zinc	20	NA	NA	NA	**32.7**	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.28 UJ	0.26 UJ	0.43 UJ	2.1	4.8	6
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	38 U	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	38 U	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	38 U	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	38 U	NA	NA
4,4'-DDE	2100	NA	NA	NA	38 U	NA	NA
4,4'-DDT	2100	NA	NA	NA	38 U	NA	NA
Aldrin	2900	NA	NA	NA	19 U	NA	NA
alpha-BHC	110	NA	NA	NA	19 U	NA	NA
alpha-Chlordane	5400	NA	NA	NA	19 U	NA	NA
beta-BHC	200	NA	NA	NA	19 U	NA	NA
delta-BHC	300	NA	NA	NA	19 U	NA	NA
Dieldrin	44	NA	NA	NA	38 U	NA	NA
Endosulfan I	900	NA	NA	NA	19 U	NA	NA
Endosulfan II	900	NA	NA	NA	38 U	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	38 U	NA	NA
Endrin	100	NA	NA	NA	38 U	NA	NA
Endrin aldehyde	NE	NA	NA	NA	38 U	NA	NA
Endrin ketone	NE	NA	NA	NA	38 U	NA	NA
gamma-Chlordane	540	NA	NA	NA	19 U	NA	NA
Heptachlor	100	NA	NA	NA	19 U	NA	NA
Heptachlor epoxide	20	NA	NA	NA	19 U	NA	NA
Lindane	NE	NA	NA	NA	19 U	NA	NA
Methoxychlor	NE	NA	NA	NA	190 U	NA	NA
Toxaphene	NE	NA	NA	NA	1900 U	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-16	RPSB-17	RPSB-18		RPSB-21	RPSB-22
		6-8	5-7	4-6	10-12	7-9	4-6
		RPSB-16 (6-8)	RPSB-17 (5-7)	RPSB-18 (4-6)	RPSB-18 (10-12)	RPSB-21 (7-9)	RPSB-22 (4-6)
		12/03/1999	12/07/1999	12/08/1999	12/08/1999	12/15/1999	12/01/1999
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.32 U	0.006 U	6.4 U	**1**	0.001 U	**39**
Ethyl benzene	5.5	4.3	0.074	**95**	**16**	0.001 U	**100 D**
Toluene	1.5	1.4	0.006 U	6.4 U	0.6 U	0.001 U	**1.9**
Xylene (total)	1.2	**22**	0.006 U	**83**	**14**	0.005	**320 D**
Total BTEX		27.7	0.074	178	31	0.005	460.9
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**60**	NA	**13**	0.22 J	0.08 J	**80 DJ**
Benzo(a)pyrene	0.061	**55**	NA	**9.4 J**	**0.16 J**	0.41 U	**61 DJ**
Benzo(b)fluoranthene	1.1	**39 J**	NA	**8.4 J**	0.11 J	0.41 U	**46 DJ**
Benzo(k)fluoranthene	1.1	**19 J**	NA	**4.2 J**	0.054 J	0.41 U	**21**
Chrysene	0.4	**54**	NA	**11**	0.19 J	0.068 J	**74 DJ**
Dibenzo(a,h)anthracene	0.014	**6.4 J**	NA	**1.1 J**	0.39 U	0.41 U	**8**
Indeno(1,2,3-cd)pyrene	3.2	**21 J**	NA	2.9 J	0.046 J	0.41 U	**29**
Total Carcinogenic PAHs		254.4	NA	50	0.78	0.148	319
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	**250**	NA	**200 D**	0.36 J	0.18 J	**710 D**
Acenaphthene	50	39 J	NA	39	0.31 J	0.41 U	**200 D**
Acenaphthylene	41	**45**	NA	5 J	0.18 J	0.047 J	23
Anthracene	50	**67**	NA	21	0.34 J	0.076 J	**130 DJ**
Benzo(g,h,i)perylene	50	24 J	NA	3.6 J	0.059 J	0.41 U	25 DJ
Fluoranthene	50	**120**	NA	24	0.4	0.13 J	**170 DJ**
Fluorene	50	**84**	NA	30	0.37 J	0.086 J	**180 DJ**
Naphthalene	13	**340**	NA	**560 D**	0.75	0.1 J	**1400 D**
Phenanthrene	50	**250**	NA	**76**	1.3	0.34 J	**480 D**
Pyrene	50	**150**	NA	40	0.62	0.23 J	**210 D**
Total Non-Carcinogenic PAHs		1369	NA	998.6	4.689	1.189	3528
Total PAHs		1623.4	NA	1048.6	5.469	1.337	3847
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	15000 U	15000 U	13000 U	13000 U	15000 U	15000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	**9100 J**	NA	3900 J	390 U	410 U	**18000**
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-16	RPSB-17	RPSB-18		RPSB-21	RPSB-22
		6-8	5-7	4-6	10-12	7-9	4-6
		RPSB-16 (6-8)	RPSB-17 (5-7)	RPSB-18 (4-6)	RPSB-18 (10-12)	RPSB-21 (7-9)	RPSB-22 (4-6)
		12/03/1999	12/07/1999	12/08/1999	12/08/1999	12/15/1999	12/01/1999
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	4	1.3	1.4	0.35 U	0.56 B	0.72 B
Barium	300	27.3 E	2 B	4.1 B	1.6 B	4.4 B	3.2 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	1	**1.2**	0.37 B	0.23 U	0.19 U	0.22 U
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	5.6	1.7 B	5	1.8 B	3.2	1.7 B
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	70.9	12.5	2.5	1.8	1.1	1.9
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.016 U	0.019 U	0.016 U	0.019 U	0.019 U	0.019 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	**3.3**	**7.1**	0.44 U	0.5 B	0.47 B	0.43 U
Silver	NE*	0.92 B	0.35 B	0.38 B	0.35 U	0.29 U	0.32 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	25.3	4	0.75 B	0.15 B	0.66	1.2
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-22	RPSB-23	RPSB-24		RPSB-27	
		8-10	2-4	3-5	5-7	2-4	2-4
		RPSB-22 (8-10)	RPSB-23 (2-4)	RPSB-24 (3-5)	RPSB-24 (5-7)	RPSB-27 (2-4)	RPSB27 (2-4)
		12/01/1999	01/04/2000	01/10/2000	01/10/2000	12/16/1999	12/16/1999
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	**4.9**	**3.2 J**	0.014	3 U	**0.99 J**	NA
Ethyl benzene	5.5	**14**	**94**	0.12	**120**	**39 DJ**	NA
Toluene	1.5	1.2 U	**4.9 J**	0.007	3 U	**15**	NA
Xylene (total)	1.2	**29**	**220**	**1.7 D**	**160**	**130**	NA
Total BTEX		47.9	322.1	1.841	280	184.99	NA
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	11000 U	6 U	NA	1100 U	NA
2-Butanone	300	NA	11000 U	6 U	NA	1100 U	NA
2-Hexanone	NE	NA	11000 U	6 U	NA	1100 U	NA
Acetone	200	NA	11000 U	6 B	NA	1100 U	NA
Benzene, 1,2,4-trimethyl	NE	NA	200000	6 U	NA	71000 E	NA
Benzene, 1,3,5-trimethyl-	NE	NA	75000	1100 E	NA	25000	NA
Benzene, 1-methylethyl-	NE	NA	13000	170	NA	7900	NA
Carbon disulfide	2700	NA	11000 U	2 J	NA	1100 U	NA
Chlorobenzene	1700	NA	11000 U	6 U	NA	1100 U	NA
Methylene chloride	100	NA	11000 U	37 B	NA	**460 J**	NA
n-Butylbenzene	NE	NA	11000 U	6 U	NA	1100 U	NA
n-Propylbenzene	NE	NA	4900 J	6 U	NA	2700	NA
sec-Butylbenzene	NE	NA	11000 U	6 U	NA	1100 U	NA
Styrene	NE	NA	11000 U	6 U	NA	1100 U	NA
Tetrachloroethene	1400	NA	11000 U	6 U	NA	1100 U	NA
Trichloroethene	700	NA	11000 U	6 U	NA	1100 U	NA
Trichlorofluoromethane	NE	NA	11000 U	6 U	NA	1100 U	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**39 DJ**	**57 DJ**	**70 DJ**	**13 DJ**	**45 DJ**	NA
Benzo(a)pyrene	0.061	**28 DJ**	**36 DJ**	**46**	**7.8 DJ**	**34 DJ**	NA
Benzo(b)fluoranthene	1.1	**21 DJ**	**28 DJ**	**51**	**5.9 DJ**	**25 DJ**	NA
Benzo(k)fluoranthene	1.1	**9.2 DJ**	**13 DJ**	**20**	**4**	**19**	NA
Chrysene	0.4	**33 DJ**	**50 DJ**	**61 DJ**	**11 DJ**	**39 DJ**	NA
Dibenzo(a,h)anthracene	0.014	**3**	**16**	**8.1**	**0.82**	**7.2**	NA
Indeno(1,2,3-cd)pyrene	3.2	**12 DJ**	**58**	**28**	**3.8**	**30 E**	NA
Total Carcinogenic PAHs		145.2	258	284.1	46.32	199.2	NA
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.41 U	**380 D**	24	**230 D**	**510 D**	NA
Acenaphthene	50	**110 DJ**	26 DJ	22	39 DJ	**54 DJ**	NA
Acenaphthylene	41	13 DJ	22 DJ	20	5 DJ	**77 DJ**	NA
Anthracene	50	**68 DJ**	**88 D**	**53**	18 DJ	**64 DJ**	NA
Benzo(g,h,i)perylene	50	12 DJ	**58**	34	2.7	34 E	NA
Fluoranthene	50	**80 DJ**	**97 D**	**110 DJ**	22 DJ	**64 DJ**	NA
Fluorene	50	**86 D**	**110 D**	**59 DJ**	33 DJ	**92 DJ**	NA
Naphthalene	13	**840 D**	**400 D**	**19**	**520 D**	**690 D**	NA
Phenanthrene	50	**240 D**	**310 D**	**250 D**	**84 D**	**280 D**	NA
Pyrene	50	**100 D**	**160 D**	**170 D**	45 D	**140 DJ**	NA
Total Non-Carcinogenic PAHs		1549	1651	761	998.7	2005	NA
Total PAHs		1694.2	1909	1045.1	1045.02	2204.2	NA
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	11000 U	6 U	NA	1100 U	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	410 U	3700 U	NA	1800 U	NA
2,4-Dinitrotoluene	NE	NA	410 U	3700 U	NA	1800 U	NA
2-Methylphenol	1000	NA	410 U	3700 U	NA	1800 U	NA
4-Methylphenol	900	NA	410 U	3700 U	NA	1800 U	NA
Benzene, hydroxy-	NE	15000 U	410 U	3700 U	13000 U	1800 U	NA
Bis(2-ethylhexyl)phthalate	50000	NA	410 U	3700 U	NA	1800 U	NA
Butylbenzylphthalate	50000	NA	410 U	3700 U	NA	1800 U	NA
Carbazole	NE	NA	4600	720 J	NA	3300	NA
Dibenzofuran	6200	**6400**	**36000**	5200	390 U	**29000**	NA
Di-n-butylphthalate	8100	NA	410 U	3700 U	NA	1800 U	NA
Di-n-octylphthalate	50000	NA	410 U	3700 U	NA	1800 U	NA
N-Nitrosodiphenylamine (1)	NE	NA	410 U	3700 U	NA	1800 U	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-22	RPSB-23	RPSB-24		RPSB-27	
		8-10	2-4	3-5	5-7	2-4	2-4
		RPSB-22 (8-10)	RPSB-23 (2-4)	RPSB-24 (3-5)	RPSB-24 (5-7)	RPSB-27 (2-4)	RPSB27 (2-4)
		12/01/1999	01/04/2000	01/10/2000	01/10/2000	12/16/1999	12/16/1999
Metals (mg/kg)							
Aluminum	NE*	NA	942	1310	NA	NA	858
Antimony	NE*	NA	0.61 B	0.21 U	NA	NA	0.41 B
Arsenic	7.5	0.33 U	2.4	5.4	0.49 B	NA	1.3
Barium	300	2.4 B	7.4 B	44.9	2.2 B	NA	9.4 B
Beryllium	0.16	NA	0.23 U	0.21 U	NA	NA	0.21 U
Cadmium	1	0.22 U	0.23 U	**1.7**	0.2 U	NA	0.27 B
Calcium	NE*	NA	264	13100	NA	NA	1480
Chromium	10	1.6 B	5	4.9	1.5 B	NA	4.4
Cobalt	30	NA	2.1 B	2.4 B	NA	NA	1.5 B
Copper	25	NA	14.5	**40**	NA	NA	4.7 B
Iron	2000	NA	**2530**	**8290**	NA	NA	**3030**
Lead	NE*	3	25.9	95	1.1	NA	5.4
Magnesium	NE*	NA	179	6990	NA	NA	386
Manganese	NE*	NA	10	44.3	NA	NA	17.6 B
Mercury	0.1	0.02 U	0.074	**0.2**	0.019 U	NA	0.018 U
Nickel	13	NA	6.8	8.7 E	NA	NA	5.2 B
Potassium	NE*	NA	94.7	183 B	NA	NA	246
Selenium	2	0.44 U	0.63 B	0.41 U	0.93 B	NA	0.43 U
Silver	NE*	0.33 U	0.63 B	1 B	0.31 U	NA	0.32 U
Sodium	NE*	NA	189	137	NA	NA	59.9
Thallium	NE*	NA	0.35 U	0.31 U	NA	NA	0.32 U
Vanadium	150	NA	3.3 B	9.3	NA	NA	4.6 B
Zinc	20	NA	**251**	**132**	NA	NA	12.8 E
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.045 B	1.5	0.88	0.2 B	NA	0.4 B
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	37 U	37 U	NA	37 U	NA
Aroclor 1254	1000/10000	NA	320	37 U	NA	37 U	NA
Aroclor 1260	1000/10000	NA	37 U	37 U	NA	37 U	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	100	29	NA	37 U	NA
4,4'-DDE	2100	NA	37 U	3.7 U	NA	37 U	NA
4,4'-DDT	2100	NA	500	15	NA	52	NA
Aldrin	2900	NA	41	7.8	NA	19 U	NA
alpha-BHC	110	NA	32	3.1	NA	19 U	NA
alpha-Chlordane	5400	NA	19 U	3	NA	19 U	NA
beta-BHC	200	NA	19 U	2.3	NA	19 U	NA
delta-BHC	300	NA	19 U	2.5	NA	53	NA
Dieldrin	44	NA	370	5.4	NA	37 U	NA
Endosulfan I	900	NA	36	2.3	NA	19 U	NA
Endosulfan II	900	NA	37 U	21	NA	37 U	NA
Endosulfan sulfate	1000	NA	48	3.7 U	NA	37 U	NA
Endrin	100	NA	230	16	NA	37 U	NA
Endrin aldehyde	NE	NA	37 U	3.7 U	NA	37 U	NA
Endrin ketone	NE	NA	37 U	3.7 U	NA	37 U	NA
gamma-Chlordane	540	NA	180	8.7	NA	19 U	NA
Heptachlor	100	NA	49	1.9 U	NA	19 U	NA
Heptachlor epoxide	20	NA	19 U	17	NA	70	NA
Lindane	NE	NA	19 U	5.9	NA	19 U	NA
Methoxychlor	NE	NA	190 U	19 U	NA	190 U	NA
Toxaphene	NE	NA	1900 U	190 U	NA	1900 U	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-27		RPSB-28		RPSB-29	
		10-12 RPSB-27 (10-12) 12/16/1999	10-12 RPSB27 (10-12) 12/16/1999	2-4 RPSB-28 (2-4) 12/29/1999	4-6 RPSB-28 (4-6) 12/29/1999	5-7 RBSB-29 (5-7) 12/10/1999	5-7 RBSB29 (5-7) 12/10/1999
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	NA	**7**	**1.1**	**12**	0.3 U	NA
Ethyl benzene	5.5	NA	**63**	**13**	**32**	**24**	NA
Toluene	1.5	NA	**31**	0.32	1.2 U	0.3 U	NA
Xylene (total)	1.2	NA	**130**	**25**	**56**	**42**	NA
Total BTEX		NA	231	39.42	100	66	NA
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**73 DJ**	NA	**60 D**	**110 D**	**49 J**	NA
Benzo(a)pyrene	0.061	**53 DJ**	NA	**48 D**	**84 D**	**36 J**	NA
Benzo(b)fluoranthene	1.1	**45 DJ**	NA	**47 D**	**74 D**	**28 J**	NA
Benzo(k)fluoranthene	1.1	**13**	NA	**14 DJ**	**16**	**16 J**	NA
Chrysene	0.4	**68 DJ**	NA	**62 D**	**110 D**	**41 J**	NA
Dibenzo(a,h)anthracene	0.014	**5.2**	NA	**6.6 DJ**	**8.6**	78 U	NA
Indeno(1,2,3-cd)pyrene	3.2	**17**	NA	**23 DJ**	**35 DJ**	**12 J**	NA
Total Carcinogenic PAHs		274.2	NA	260.6	437.6	182	NA
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	**840 D**	NA	**240 D**	**590 D**	**390**	NA
Acenaphthene	50	**170 D**	NA	33 DJ	**56 D**	**95**	NA
Acenaphthylene	41	**42 DJ**	NA	33 DJ	**43 DJ**	19 J	NA
Anthracene	50	**95 DJ**	NA	**88 D**	**200 D**	**71 J**	NA
Benzo(g,h,i)perylene	50	19	NA	26 DJ	38 DJ	15 J	NA
Fluoranthene	50	**130 D**	NA	**100 D**	**200 D**	**78**	NA
Fluorene	50	**170 D**	NA	**88 D**	**200 D**	**88**	NA
Naphthalene	13	**1200 D**	NA	**360 D**	**830 D**	**900**	NA
Phenanthrene	50	**480 D**	NA	**280 D**	**630 D**	**260**	NA
Pyrene	50	**220 D**	NA	**170 D**	**320 D**	**130**	NA
Total Non-Carcinogenic PAHs		3366	NA	1418	3107	2046	NA
Total PAHs		3640.2	NA	1678.6	3544.6	2228	NA
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	15000 U	NA	13000 U	13000 U	NA	11000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	**21000**	NA	**9000 DJ**	**19000**	**10000 J**	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-27		RPSB-28		RPSB-29	
		10-12 RPSB-27 (10-12) 12/16/1999	10-12 RPSB27 (10-12) 12/16/1999	2-4 RPSB-28 (2-4) 12/29/1999	4-6 RPSB-28 (4-6) 12/29/1999	5-7 RBSB-29 (5-7) 12/10/1999	5-7 RBSB29 (5-7) 12/10/1999
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	NA	1.5	3.2	4.7	0.33 B	NA
Barium	300	NA	5.4 B	34	19 B	2.3 B	NA
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	NA	0.21 U	0.67	0.83	0.21 U	NA
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	NA	2.7	5.5 *	**20.3 ***	2.3	NA
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	NA	12.6	56.8 *	130 *	0.78 B	NA
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	NA	0.018 B	0.032 B*	0.076 *	0.016 U	NA
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	NA	1.1 B	**7.1**	**3.9**	0.42 U	NA
Silver	NE*	NA	0.31 U	0.28 U	0.32 U	0.48 B	NA
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	NA	0.1 B	5.7 N	7.9 N	0.055 U	NA
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-29	RPSB-30	RPSB-31A		RPSB-31B	
		7-9	9-11	2-4	4-6	4-6	6-8
		RPSB-29 (7-9)	RPSB-30 (9-11)	RPSB-31A (2-4)	RPSB-31A (4-6)	RPSB-31B (4-6)	RPSB-31B (6-8)
		02/02/2000	01/31/2000	01/04/2000	01/04/2000	01/11/2000	01/11/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	**1 J**	**0.74 J**	**0.18**	**9.2**	0.001 J	1.2 U
Ethyl benzene	5.5	**28**	**15**	0.39	**130**	0.002	**14**
Toluene	1.5	3 U	3 U	0.029	**4.6**	0.001 U	1.2 U
Xylene (total)	1.2	**53**	**16**	0.12	**140**	0.009	**17**
Total BTEX		82	31.74	0.719	283.8	0.012	31
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	3000 U	3000 U	NA	NA	NA	NA
2-Butanone	300	3000 U	3000 U	NA	NA	NA	NA
2-Hexanone	NE	3000 U	3000 U	NA	NA	NA	NA
Acetone	200	3000 U	3000 U	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	17000	14000	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	6100	4700	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	2500 J	2000 J	NA	NA	NA	NA
Carbon disulfide	2700	3000 U	3000 U	NA	NA	NA	NA
Chlorobenzene	1700	3000 U	3000 U	NA	NA	NA	NA
Methylene chloride	100	3000 U	3000 U	NA	NA	NA	NA
n-Butylbenzene	NE	3000 U	3000 U	NA	NA	NA	NA
n-Propylbenzene	NE	980 J	770 J	NA	NA	NA	NA
sec-Butylbenzene	NE	3000 U	3000 U	NA	NA	NA	NA
Styrene	NE	3000 U	3000 U	NA	NA	NA	NA
Tetrachloroethene	1400	3000 U	3000 U	NA	NA	NA	NA
Trichloroethene	700	3000 U	3000 U	NA	NA	NA	NA
Trichlorofluoromethane	NE	3000 U	3000 U	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**37 J**	**73 J**	**70**	**42**	0.038 J	**4.5 J**
Benzo(a)pyrene	0.061	**28 J**	**53 J**	**54**	**32**	**0.064 J**	**5.2 J**
Benzo(b)fluoranthene	1.1	**22 J**	**48 J**	**69**	**29**	0.35 U	**5.7 J**
Benzo(k)fluoranthene	1.1	79 U	**17 J**	**19**	**11**	0.35 U	0.92 J
Chrysene	0.4	**35 J**	**70 J**	**79**	**42**	0.35 U	**3.5 J**
Dibenzo(a,h)anthracene	0.014	79 U	120 U	**11 J**	**4.1**	0.35 U	7.6 U
Indeno(1,2,3-cd)pyrene	3.2	**8.4 J**	**21 J**	**35**	**17**	0.24 J	2.9 J
Total Carcinogenic PAHs		130.4	282	337	177.1	0.342	22.72
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	**430**	**810**	6.1 J	**350 D**	0.35 U	8
Acenaphthene	50	79 U	**91 J**	12 J	**52**	0.35 U	2.9 J
Acenaphthylene	41	19 J	31 J	34	34	0.36	1.8 J
Anthracene	50	**64 J**	**51 J**	33	47	0.096 J	2.4 J
Benzo(g,h,i)perylene	50	9.1 J	24 J	44	19	0.96	3.7 J
Fluoranthene	50	**61 J**	**130**	**110**	**59**	0.036 J	7.8
Fluorene	50	**84**	**140**	29	**73 DJ**	0.042 J	3.9 J
Naphthalene	13	**840**	**1400**	**13 J**	**840 D**	0.13 J	**97**
Phenanthrene	50	**220**	**390**	**110**	**220 D**	0.058 J	8
Pyrene	50	**100**	**220**	**200**	**130 DJ**	0.078 J	16
Total Non-Carcinogenic PAHs		1827.1	3287	591.1	1824	1.76	151.5
Total PAHs		1957.5	3569	928.1	2001.1	2.102	174.22
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	3000 U	3000 U	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	79000 U	120000 U	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	79000 U	120000 U	NA	NA	NA	NA
2-Methylphenol	1000	79000 U	120000 U	NA	NA	NA	NA
4-Methylphenol	900	79000 U	120000 U	NA	NA	NA	NA
Benzene, hydroxy-	NE	79000 U	120000 U	12000 U	12000 U	13000 U	13000 U
Bis(2-ethylhexyl)phthalate	50000	79000 U	120000 U	NA	NA	NA	NA
Butylbenzylphthalate	50000	79000 U	120000 U	NA	NA	NA	NA
Carbazole	NE	79000 U	120000 U	NA	NA	NA	NA
Dibenzofuran	6200	**11000 J**	**18000 J**	3000 J	**9500**	350 U	7600 U
Di-n-butylphthalate	8100	79000 U	120000 U	NA	NA	NA	NA
Di-n-octylphthalate	50000	79000 U	120000 U	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	79000 U	120000 U	NA	NA	NA	NA
p-Cymene	NE	960 J	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-29	RPSB-30	RPSB-31A		RPSB-31B	
		7-9	9-11	2-4	4-6	4-6	6-8
		RPSB-29 (7-9)	RPSB-30 (9-11)	RPSB-31A (2-4)	RPSB-31A (4-6)	RPSB-31B (4-6)	RPSB-31B (6-8)
		02/02/2000	01/31/2000	01/04/2000	01/04/2000	01/11/2000	01/11/2000
Metals (mg/kg)							
Aluminum	NE*	303	161	NA	NA	NA	NA
Antimony	NE*	0.3 U	0.33 B	NA	NA	NA	NA
Arsenic	7.5	0.62 B	0.31 U	**9.1**	4.9	0.5 B	1.1
Barium	300	2.1 B	1.1 B	261	75.8	2 B	2.9 B
Beryllium	0.16	0.2 U	0.21 U	NA	NA	NA	NA
Cadmium	1	0.091 B	0.21 U	**2.2**	**1.5**	0.19 U	0.27 B
Calcium	NE*	294	49.6 B	NA	NA	NA	NA
Chromium	10	1.9 B	0.89 B	**14.9**	6.3	1.9 B	1.9 B
Cobalt	30	0.5 B	0.31 U	NA	NA	NA	NA
Copper	25	1.1 B	0.82 B	NA	NA	NA	NA
Iron	2000	1290	1310	NA	NA	NA	NA
Lead	NE*	0.76 B*	0.36 B	448	134	1.9	8.8
Magnesium	NE*	135	69.1	NA	NA	NA	NA
Manganese	NE*	9.6	4.8 B	NA	NA	NA	NA
Mercury	0.1	0.02 U	0.019 U	**1.2**	**0.21**	0.017 U	0.024 B
Nickel	13	1.1 B	0.71 B	NA	NA	NA	NA
Potassium	NE*	125 B	66.4 B	NA	NA	NA	NA
Selenium	2	0.39 U	0.42 U	1.9	0.66 B	0.38 U	0.43 U
Silver	NE*	0.26 B	0.31 U	3.9	2.8	0.28 U	0.32 U
Sodium	NE*	37.2 B	54.5 B	NA	NA	NA	NA
Thallium	NE*	0.3 U	0.31 U	NA	NA	NA	NA
Vanadium	150	0.49 B	0.21 U	NA	NA	NA	NA
Zinc	20	3.1 B	4.2 B	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.23 B	0.099 B	9.2	4.7	0.063 B	0.052 U
PCBs (ug/kg)							
Aroclor 1242	1000/10000	40 U	39 U	NA	NA	NA	NA
Aroclor 1254	1000/10000	40 U	39 U	NA	NA	NA	NA
Aroclor 1260	1000/10000	40 U	39 U	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	12 P	8.7	NA	NA	NA	NA
4,4'-DDE	2100	4 U	3.9 U	NA	NA	NA	NA
4,4'-DDT	2100	260 PE	370 E	NA	NA	NA	NA
Aldrin	2900	2.1 U	2.0 U	NA	NA	NA	NA
alpha-BHC	110	2.2 P	2.0 U	NA	NA	NA	NA
alpha-Chlordane	5400	2.1 U	2.0 U	NA	NA	NA	NA
beta-BHC	200	2.1 U	2.0 U	NA	NA	NA	NA
delta-BHC	300	14 P	28	NA	NA	NA	NA
Dieldrin	44	42	45	NA	NA	NA	NA
Endosulfan I	900	2.4 P	2.0 U	NA	NA	NA	NA
Endosulfan II	900	4 U	3.9 U	NA	NA	NA	NA
Endosulfan sulfate	1000	47 P	39	NA	NA	NA	NA
Endrin	100	4 U	3.9 U	NA	NA	NA	NA
Endrin aldehyde	NE	4 U	3.9 U	NA	NA	NA	NA
Endrin ketone	NE	4 U	3.9 U	NA	NA	NA	NA
gamma-Chlordane	540	75 PE	2.0 U	NA	NA	NA	NA
Heptachlor	100	2.1 U	2.0 U	NA	NA	NA	NA
Heptachlor epoxide	20	2.1 U	2.0 U	NA	NA	NA	NA
Lindane	NE	2.1 U	2.0 U	NA	NA	NA	NA
Methoxychlor	NE	21 U	32	NA	NA	NA	NA
Toxaphene	NE	210 U	200 U	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-34	RPSB-35		RPSB-36		RPSB-37
		8-10	0-2	10-12	5-7	7-9	10-12
		RPSB-34 (8-10)	RPSB-35 (0-2)	RPSB-35 (10-12)	RPSB-36 (5-7)	RPSB-36 (7-9)	RPSB-37 (10-12)
		12/29/1999	01/03/2000	01/03/2000	01/03/2000	01/03/2000	01/12/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.005	0.016	**41**	**8.7**	**12**	**0.33**
Ethyl benzene	5.5	0.07	0.005 J	**120**	**41**	**53**	3
Toluene	1.5	0.001 U	0.013	**33**	0.56 U	0.57 U	0.12 U
Xylene (total)	1.2	0.052	0.007	**260**	**9.3**	**10**	**2.5**
Total BTEX		0.127	0.041	454	59	75	5.83
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	4 J	NA	NA	NA	NA
2-Butanone	300	NA	6 U	NA	NA	NA	NA
2-Hexanone	NE	NA	6 U	NA	NA	NA	NA
Acetone	200	NA	6 U	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	1 J	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	6 U	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	6 U	NA	NA	NA	NA
Carbon disulfide	2700	NA	6 U	NA	NA	NA	NA
Chlorobenzene	1700	NA	6 U	NA	NA	NA	NA
Methylene chloride	100	NA	6 U	NA	NA	NA	NA
n-Butylbenzene	NE	NA	6 U	NA	NA	NA	NA
n-Propylbenzene	NE	NA	6 U	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	6 U	NA	NA	NA	NA
Styrene	NE	NA	2 J	NA	NA	NA	NA
Tetrachloroethene	1400	NA	6 U	NA	NA	NA	NA
Trichloroethene	700	NA	6 U	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	6 U	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**28**	**4.9**	**790 U**	**12**	**24**	**3.2 J**
Benzo(a)pyrene	0.061	**24**	**4.5**	**790 U**	**12**	**18**	**1.7 J**
Benzo(b)fluoranthene	1.1	**17**	**5.3**	**790 U**	**12**	**17**	**1.7 J**
Benzo(k)fluoranthene	1.1	**7**	**5.3**	**790 U**	**3.3 J**	**6.6**	0.97 J
Chrysene	0.4	**25**	**5**	**82 DJ**	**14**	**22**	**3.7 J**
Dibenzo(a,h)anthracene	0.014	**1.6 J**	**1.1 J**	**2.5**	**1.8 J**	**1.5 J**	7.9 U
Indeno(1,2,3-cd)pyrene	3.2	**8.8**	**3.7 J**	**790 U**	**9.7**	**7.8**	7.9 U
Total Carcinogenic PAHs		111.4	29.8	84.5	64.8	96.9	11.27
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	**240 D**	1.4 J	**640 DJ**	**37**	**230 D**	**46**
Acenaphthene	50	**83 D**	4 U	**180 DJ**	10	37	3.7 J
Acenaphthylene	41	4.8	2.7 J	790 U	4.3	6.7	7.9 U
Anthracene	50	43	1.9 J	**110 DJ**	10	31	2.8 J
Benzo(g,h,i)perylene	50	10	3.9 J	790 U	13	9.6	7.9 U
Fluoranthene	50	38	8.2	**140 DJ**	8.8	32	6.1 J
Fluorene	50	47	0.67 J	**130 DJ**	12	42	9.5
Naphthalene	13	**510 D**	3.5 J	**1300 D**	**110 D**	**460 D**	**90**
Phenanthrene	50	**180 D**	4.9	**450 DJ**	42	**160 D**	29
Pyrene	50	**750 D**	8.5	**210 DJ**	49	**74 D**	12
Total Non-Carcinogenic PAHs		1905.8	35.67	3160	296.1	1082.3	199.1
Total PAHs		2017.2	65.47	3244.5	360.9	1179.2	210.37
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	6 U	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	4000 U	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	4000 U	NA	NA	NA	NA
2-Methylphenol	1000	NA	4000 U	NA	NA	NA	NA
4-Methylphenol	900	NA	4000 U	NA	NA	NA	NA
Benzene, hydroxy-	NE	14000 U	4000 U	14000 U	14000 U	14000 U	13000 U
Bis(2-ethylhexyl)phthalate	50000	NA	4000 U	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	4000 U	NA	NA	NA	NA
Carbazole	NE	NA	4000 U	NA	NA	NA	NA
Dibenzofuran	6200	5900	470 J	**8000 E**	2400 J	**7500**	2500 J
Di-n-butylphthalate	8100	NA	4000 U	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	4000 U	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	4000 U	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-34	RPSB-35		RPSB-36		RPSB-37
		8-10	0-2	10-12	5-7	7-9	10-12
		RPSB-34 (8-10)	RPSB-35 (0-2)	RPSB-35 (10-12)	RPSB-36 (5-7)	RPSB-36 (7-9)	RPSB-37 (10-12)
		12/29/1999	01/03/2000	01/03/2000	01/03/2000	01/03/2000	01/12/2000
Metals (mg/kg)							
Aluminum	NE*	NA	1990	NA	NA	NA	NA
Antimony	NE*	NA	0.15 U	NA	NA	NA	NA
Arsenic	7.5	0.49 B	1.8	0.53 B	1 B	1.1 B	0.32 U
Barium	300	2.1 B	16.4 E	1.5 B	9.6 B	10.6 B	2.3 B
Beryllium	0.16	NA	0.15 U	NA	NA	NA	NA
Cadmium	1	0.22 U	0.25 B	0.21 U	0.21 U	0.22 U	0.22 U
Calcium	NE*	NA	8290	NA	NA	NA	NA
Chromium	10	1.7 B	4.7	1.2 B	2.6	2.1 B	2 B
Cobalt	30	NA	2.6 B	NA	NA	NA	NA
Copper	25	NA	13.1	NA	NA	NA	NA
Iron	2000	NA	**5100**	NA	NA	NA	NA
Lead	NE*	1.7	30.2	0.46 B	52.5	3.6	3.9
Magnesium	NE*	NA	2830	NA	NA	NA	NA
Manganese	NE*	NA	76.6	NA	NA	NA	NA
Mercury	0.1	0.019 U	0.051	0.019 U	0.045 B	0.019 U	0.055 B
Nickel	13	NA	7.4	NA	NA	NA	NA
Potassium	NE*	NA	261	NA	NA	NA	NA
Selenium	2	0.44 B	0.29 U	0.6 B	0.68 B	0.62 B	1.2 B
Silver	NE*	0.35 B	0.85 B	0.31 U	0.49 B	0.48 B	0.32 U
Sodium	NE*	NA	11 U	NA	NA	NA	NA
Thallium	NE*	NA	0.22 U	NA	NA	NA	NA
Vanadium	150	NA	19.3	NA	NA	NA	NA
Zinc	20	NA	**31.4**	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.075 B	0.072 B	0.034 U	0.052 U	0.046 U	0.12 B
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	39 U	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	39 U	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	39 U	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	39 U	NA	NA	NA	NA
4,4'-DDE	2100	NA	39 U	NA	NA	NA	NA
4,4'-DDT	2100	NA	39 U	NA	NA	NA	NA
Aldrin	2900	NA	20 U	NA	NA	NA	NA
alpha-BHC	110	NA	20 U	NA	NA	NA	NA
alpha-Chlordane	5400	NA	20 U	NA	NA	NA	NA
beta-BHC	200	NA	20 U	NA	NA	NA	NA
delta-BHC	300	NA	20 U	NA	NA	NA	NA
Dieldrin	44	NA	39 U	NA	NA	NA	NA
Endosulfan I	900	NA	20 U	NA	NA	NA	NA
Endosulfan II	900	NA	39 U	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	39 U	NA	NA	NA	NA
Endrin	100	NA	39 U	NA	NA	NA	NA
Endrin aldehyde	NE	NA	39 U	NA	NA	NA	NA
Endrin ketone	NE	NA	39 U	NA	NA	NA	NA
gamma-Chlordane	540	NA	20 U	NA	NA	NA	NA
Heptachlor	100	NA	20 U	NA	NA	NA	NA
Heptachlor epoxide	20	NA	20 U	NA	NA	NA	NA
Lindane	NE	NA	20 U	NA	NA	NA	NA
Methoxychlor	NE	NA	200 U	NA	NA	NA	NA
Toxaphene	NE	NA	2000 U	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-38		RPSB-41		RPSB-42	
		4-6 RPSB-38 (4-6) 01/13/2000	10-12 RPSB-38 (10-12) 01/13/2000	7-9 RPSB-41 (7-9) 12/15/1999	9-11 RPSB-41 (9-11) 12/16/1999	5-7 RPSB-42 (5-7) 01/19/2000	10-12 RPSB-42 (10-12) 01/19/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.03	0.012 U	61 U	0.31 U	0.26 U	**0.39**
Ethyl benzene	5.5	0.026	0.23	**75**	**7.4**	0.26 U	2.6
Toluene	1.5	0.023	0.012 U	**60 J**	**1.8**	0.26 U	0.21
Xylene (total)	1.2	0.054	0.29	**240**	**20**	0.26 U	**2.7**
Total BTEX		0.133	0.52	375	29.2	0	5.9
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	6 U	NA	61000 U	NA	260 U	NA
2-Butanone	300	6 U	NA	61000 U	NA	260 U	NA
2-Hexanone	NE	6 U	NA	61000 U	NA	260 U	NA
Acetone	200	17	NA	61000 U	NA	260 U	NA
Benzene, 1,2,4-trimethyl	NE	6 J	NA	90000	NA	320	NA
Benzene, 1,3,5-trimethyl-	NE	4 J	NA	33000 J	NA	260 U	NA
Benzene, 1-methylethyl-	NE	6 U	NA	61000 U	NA	260 U	NA
Carbon disulfide	2700	6 U	NA	61000 U	NA	260 U	NA
Chlorobenzene	1700	6 U	NA	61000 U	NA	260 U	NA
Methylene chloride	100	**120**	NA	**37000 J**	NA	260 U	NA
n-Butylbenzene	NE	6 U	NA	61000 U	NA	260 U	NA
n-Propylbenzene	NE	6 U	NA	61000 U	NA	260 U	NA
sec-Butylbenzene	NE	6 U	NA	61000 U	NA	260 U	NA
Styrene	NE	6 U	NA	61000 U	NA	260 U	NA
Tetrachloroethene	1400	1 J	NA	61000 U	NA	260 U	NA
Trichloroethene	700	6 U	NA	61000 U	NA	260 U	NA
Trichlorofluoromethane	NE	4 J	NA	61000 U	NA	260 U	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**1.1**	**5.8 J**	**67 DJ**	**60 DJ**	**0.45 J**	**5.9**
Benzo(a)pyrene	0.061	**1**	**4.1 J**	**47 DJ**	**32**	**1.1**	**3.6 J**
Benzo(b)fluoranthene	1.1	**1.1**	**4.3 J**	**35 DJ**	**25**	**1.1**	**2.7 J**
Benzo(k)fluoranthene	1.1	**1.5**	**2.4 J**	**20**	**11**	0.34 J	**1.4 J**
Chrysene	0.4	**1.3**	**6 J**	**61 DJ**	**48 DJ**	**1**	**5.8**
Dibenzo(a,h)anthracene	0.014	**0.28 J**	7.5 U	**10**	**2.9**	0.69 U	**0.45 J**
Indeno(1,2,3-cd)pyrene	3.2	1.9	7.5 U	**180 U**	**8.8**	0.56 J	1.1 J
Total Carcinogenic PAHs		8.18	22.6	240	187.7	4.55	20.95
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.59	**43**	**740 D**	**740 D**	1.7	**39**
Acenaphthene	50	0.41 U	7.8	**120 D**	**59 DJ**	1.1	9.6
Acenaphthylene	41	1.1	1.2 J	**200 D**	**250 D**	0.69 U	3.9 U
Anthracene	50	0.9	4.8 J	**150 DJ**	**130 D**	0.57 J	7.4
Benzo(g,h,i)perylene	50	2.4	0.81 J	180 U	9.1	0.68 J	1.5 J
Fluoranthene	50	1.4	12	**110 DJ**	**110 D**	0.82	7.8
Fluorene	50	0.41 U	12	**190 D**	**190 D**	0.72	8.5
Naphthalene	13	0.86	**70**	**1400 B**	**1000 D**	2.8	**37**
Phenanthrene	50	0.91	42	**520 D**	**480 D**	2.2	27
Pyrene	50	2.9	26	**210 D**	**180 D**	3.8	13
Total Non-Carcinogenic PAHs		11.06	219.61	3640	3148.1	14.39	150.8
Total PAHs		19.24	242.21	3880	3335.8	18.94	171.75
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	6 U	NA	61000 U	NA	260 U	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	410 U	NA	2000 U	NA	690 U	NA
2,4-Dinitrotoluene	NE	410 U	NA	2000 U	NA	690 U	NA
2-Methylphenol	1000	410 U	NA	2000 U	NA	690 U	NA
4-Methylphenol	900	410 U	NA	2000 U	NA	690 U	NA
Benzene, hydroxy-	NE	410 U	13000 U	2000 U	15000 U	690 U	12000 U
Bis(2-ethylhexyl)phthalate	50000	410 U	NA	2000 U	NA	690 U	NA
Butylbenzylphthalate	50000	410 U	NA	2000 U	NA	690 U	NA
Carbazole	NE	410 U	NA	2000 U	NA	690 U	NA
Dibenzofuran	6200	410 U	2400 J	**20000 DJ**	**23000**	690 U	1500 J
Di-n-butylphthalate	8100	410 U	NA	2000 U	NA	690 U	NA
Di-n-octylphthalate	50000	410 U	NA	2000 U	NA	690 U	NA
N-Nitrosodiphenylamine (1)	NE	410 U	NA	2000 U	NA	690 U	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-38		RPSB-41		RPSB-42	
		4-6 RPSB-38 (4-6) 01/13/2000	10-12 RPSB-38 (10-12) 01/13/2000	7-9 RPSB-41 (7-9) 12/15/1999	9-11 RPSB-41 (9-11) 12/16/1999	5-7 RPSB-42 (5-7) 01/19/2000	10-12 RPSB-42 (10-12) 01/19/2000
Metals (mg/kg)							
Aluminum	NE*	259	NA	189	NA	322	NA
Antimony	NE*	0.23 B	NA	0.24 B	NA	0.2 B	NA
Arsenic	7.5	1.2	0.33 U	0.74 B	0.32 U	0.57 B	0.53 B
Barium	300	16.2 B*	1.5 B	4.2 B	3.5 B	5.1 B	4.3 B
Beryllium	0.16	0.19 U	NA	0.22 U	NA	0.19 U	NA
Cadmium	1	0.27 B	0.22 U	0.22 U	0.21 U	0.19 U	0.2 U
Calcium	NE*	276	NA	90.9	NA	2770	NA
Chromium	10	1.6 B	1.5 B	1.6 B	2.4	2.3	2.9
Cobalt	30	0.97 B	NA	0.33 U	NA	0.93 B	NA
Copper	25	6.4	NA	6.4	NA	1.8 B	NA
Iron	2000	**2050**	NA	610	NA	1040	NA
Lead	NE*	4.2 *	1.2	6.1	1.6	16.7	3.6
Magnesium	NE*	62.6	NA	66.9	NA	129	NA
Manganese	NE*	6.8	NA	4.3 B	NA	18.2	NA
Mercury	0.1	0.026 B	0.02 U	0.018 U	0.019 U	0.017 U	0.018 U
Nickel	13	2.1 B	NA	0.65 B	NA	2 B	NA
Potassium	NE*	62 B	NA	105	NA	74.9 B	NA
Selenium	2	1.9	0.79 B	0.44 U	0.42 U	0.39 U	0.4 U
Silver	NE*	0.29 B	0.33 U	0.33 U	0.32 U	0.29 U	0.3 U
Sodium	NE*	51.6 B	NA	16.5 U	NA	14.5 U	NA
Thallium	NE*	0.28 U	NA	0.33 U	NA	0.29 U	NA
Vanadium	150	1.3 B	NA	0.94 B	NA	2.1 B	NA
Zinc	20	22.1	NA	1.5 BE	NA	12.9	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.93 B	0.29 B	0.42 B	0.62 B	2.7	0.35 B
PCBs (ug/kg)							
Aroclor 1242	1000/10000	40 U	NA	40 U	NA	34 U	NA
Aroclor 1254	1000/10000	40 U	NA	40 U	NA	34 U	NA
Aroclor 1260	1000/10000	40 U	NA	40 U	NA	34 U	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	4.1 U	NA	68	NA	3.4 U	NA
4,4'-DDE	2100	4.1 U	NA	40 U	NA	3.4 U	NA
4,4'-DDT	2100	4.1 U	NA	110	NA	3.4 U	NA
Aldrin	2900	5.1	NA	20 U	NA	1.8 U	NA
alpha-BHC	110	2.1 U	NA	20 U	NA	1.8 U	NA
alpha-Chlordane	5400	2.1 U	NA	20 U	NA	1.8 U	NA
beta-BHC	200	2.1 U	NA	20 U	NA	1.8 U	NA
delta-BHC	300	8.8	NA	290	NA	1.8 U	NA
Dieldrin	44	4.1 U	NA	40 U	NA	3.4 U	NA
Endosulfan I	900	2.1 U	NA	20 U	NA	1.8 U	NA
Endosulfan II	900	4.1 U	NA	62	NA	3.4 U	NA
Endosulfan sulfate	1000	4.1 U	NA	82	NA	3.4 U	NA
Endrin	100	4.1 U	NA	40 U	NA	3.4 U	NA
Endrin aldehyde	NE	4.1 U	NA	40 U	NA	3.4 U	NA
Endrin ketone	NE	4.1 U	NA	40 U	NA	3.4 U	NA
gamma-Chlordane	540	2.1 U	NA	20 U	NA	1.8 U	NA
Heptachlor	100	3.9	NA	23	NA	1.8 U	NA
Heptachlor epoxide	20	4.1	NA	20 U	NA	1.8 U	NA
Lindane	NE	2.1 U	NA	20 U	NA	1.8 U	NA
Methoxychlor	NE	21 U	NA	200 U	NA	18 U	NA
Toxaphene	NE	210 U	NA	2000 U	NA	180 U	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-43		RPSB-44	RPSB-45	RPSB-46	
		5-7	9-11	10-12	6-8	4-6	8-10
		RPSB-43 (5-7)	RPSB-43 (9-11)	RPSB-44 (10-12)	RPSB-45 (6-8)	RPSB-46 (4-6)	RPSB-46 (8-10)
		12/01/1999	12/01/1999	12/03/1999	01/07/2000	12/20/1999	12/20/1999
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.023	1.2 U	**1.7**	0.062 U	0.007	**4.3**
Ethyl benzene	5.5	0.78 D	**7**	**56**	3.8	0.001 U	**35**
Toluene	1.5	0.043	**2.5**	1.2 U	0.062 U	0.006	0.6 U
Xylene (total)	1.2	0.18	**6.7**	**90**	**2.6**	0.017	**14**
Total BTEX		1.026	16.2	147.7	6.4	0.03	53.3
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**82 D**	**32 DJ**	**43 DJ**	**4**	**11**	**45 D**
Benzo(a)pyrene	0.061	**66 D**	**25 DJ**	**37 DJ**	**3.4**	**10**	**48 D**
Benzo(b)fluoranthene	1.1	**68 D**	**18 DJ**	**27 DJ**	**2.7**	**10**	**36 D**
Benzo(k)fluoranthene	1.1	**24**	**8.4 DJ**	**12 DJ**	**1.4**	**5**	**23 D**
Chrysene	0.4	**83 D**	**30 DJ**	**40 DJ**	**3.6**	**10**	**38 D**
Dibenzo(a,h)anthracene	0.014	**10**	**1.8**	**3**	**0.33 J**	**1.3 J**	**4**
Indeno(1,2,3-cd)pyrene	3.2	**28 DJ**	**7.7 DJ**	**11**	1.3	**5.2**	**19**
Total Carcinogenic PAHs		361	122.9	173	16.73	52.5	213
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	19	**210 D**	**300 D**	17 D	1 J	**85 D**
Acenaphthene	50	**110 D**	**110 D**	**130 D**	7.5 D	6.2	**69 D**
Acenaphthylene	41	24	17 DJ	11	0.82	3.6	37 D
Anthracene	50	**100 D**	**84 D**	**77 D**	5.7	8	**54 D**
Benzo(g,h,i)perylene	50	32 DJ	9.1 DJ	13	1.4	6.1	23
Fluoranthene	50	**140 D**	**62 D**	**99 D**	9.4 D	18	**76 D**
Fluorene	50	**120 D**	**73 D**	**100 D**	5.3	4.4	45 D
Naphthalene	13	**56 D**	**500 D**	**620 D**	**21 D**	1.2 J	**220 D**
Phenanthrene	50	**370 D**	**200 D**	**280 D**	22 D	23	**200 D**
Pyrene	50	**210 D**	**82 D**	**110 D**	13 D	28	**140 D**
Total Non-Carcinogenic PAHs		1181	1347.1	1740	103.12	99.5	949
Total PAHs		1542	1470	1913	119.85	152	1162
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	15000 U	15000 U	15000 U	12000 U	15000 U	15000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	**14000**	4900	**7800**	580	1200 J	**6200**
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-43		RPSB-44	RPSB-45	RPSB-46	
		5-7	9-11	10-12	6-8	4-6	8-10
		RPSB-43 (5-7)	RPSB-43 (9-11)	RPSB-44 (10-12)	RPSB-45 (6-8)	RPSB-46 (4-6)	RPSB-46 (8-10)
		12/01/1999	12/01/1999	12/03/1999	01/07/2000	12/20/1999	12/20/1999
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	4.2	4.6	0.63 B	6.2	4.3	0.61 B
Barium	300	38.8	87.6	5.3 B	51.5	269	8.2 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	**1.4**	**1.4**	0.22 B	0.35 B	**1.5**	0.23 U
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	7.8	**13.2**	2	5.1	**12.1**	2.2 B
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	301	23	5.5	15.6	160	3.6
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	**0.2**	0.02 B	0.018 U	**0.15**	**0.46**	0.019 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.41 U	0.42 U	0.35 U	0.47 U	0.45 U	0.46 U
Silver	NE*	0.96 B	0.7 B	0.26 U	0.61 B	1.5 B	0.77 B
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	1.9	2.3	0.19 B	0.42 B	1.5	1.3
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-49		RPSB-50		RPSB-51	
		2-4 RPSB-49 (2-4) 12/08/1999	8-10 RPSB-49 (8-10) 12/08/1999	5-7 RPSB-50 (5-7) 12/09/1999	7-9 RPSB-50 (7-9) 12/09/1999	5-7 RPSB-51 (5-7) 01/10/2000	10-12 RPSB-51 (10-12) 01/10/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.004	0.56 U	0.005	0.034	0.01	3.2 U
Ethyl benzene	5.5	0.004	**36**	0.003	0.26	0.009	**240**
Toluene	1.5	0.007	0.56 U	0.008	0.03	0.004 J	**44**
Xylene (total)	1.2	0.016	**120**	0.012	0.25	0.006	**410**
Total BTEX		0.031	156	0.028	0.574	0.029	694
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	5 U	NA
2-Butanone	300	NA	NA	NA	NA	6	NA
2-Hexanone	NE	NA	NA	NA	NA	5 U	NA
Acetone	200	NA	NA	NA	NA	23 B	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	5 U	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	1 J	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	5 U	NA
Carbon disulfide	2700	NA	NA	NA	NA	5 U	NA
Chlorobenzene	1700	NA	NA	NA	NA	5 U	NA
Methylene chloride	100	NA	NA	NA	NA	5 JB	NA
n-Butylbenzene	NE	NA	NA	NA	NA	5 U	NA
n-Propylbenzene	NE	NA	NA	NA	NA	5 U	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	5 U	NA
Styrene	NE	NA	NA	NA	NA	5 U	NA
Tetrachloroethene	1400	NA	NA	NA	NA	5 U	NA
Trichloroethene	700	NA	NA	NA	NA	5 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	5 U	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**5.6**	**55 D**	**1.4 J**	**17**	**25**	**74**
Benzo(a)pyrene	0.061	**4.2**	**41 D**	**1.7 J**	**22**	**27**	**71**
Benzo(b)fluoranthene	1.1	**5**	**35 DJ**	**3.8**	**19**	**25**	**46**
Benzo(k)fluoranthene	1.1	**2.5**	**15**	**1.5 J**	**5.4**	**14**	**24 J**
Chrysene	0.4	**4.5**	**52 D**	**1.8 J**	**17**	**24**	**81**
Dibenzo(a,h)anthracene	0.014	1.8 U	**0.33 J**	**0.74 J**	**1.2 J**	**3.4 J**	42 U
Indeno(1,2,3-cd)pyrene	3.2	1.9	**11**	3	**7.5**	**14**	**28 J**
Total Carcinogenic PAHs		23.7	209.33	13.94	89.1	132.4	324
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	1.2 J	**210 D**	0.49 J	14	1.1 J	**250**
Acenaphthene	50	1.8 U	**85 D**	2 U	14	7.3 U	**67**
Acenaphthylene	41	1 J	13	0.46 J	3.3	4 J	24 J
Anthracene	50	1 J	**74 D**	0.34 J	12	14	**140**
Benzo(g,h,i)perylene	50	2.3	13	4.8	9.2	20	35 J
Fluoranthene	50	7.8	**110 D**	0.81 J	25	40	**180**
Fluorene	50	1.1 J	**81 D**	2 U	12	3.1 J	**84**
Naphthalene	13	1.1 J	**350 D**	1 J	**30**	1.5 J	**540**
Phenanthrene	50	11	**250 D**	1.1 J	42 D	25	**410**
Pyrene	50	18	**250 D**	2.1	46 D	**65**	**250**
Total Non-Carcinogenic PAHs		44.5	1436	11.1	207.5	173.7	1980
Total PAHs		68.2	1645.33	25.04	296.6	306.1	2304
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	5 U	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	7300 U	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	7300 U	NA
2-Methylphenol	1000	NA	NA	NA	NA	7300 U	NA
4-Methylphenol	900	NA	NA	NA	NA	7300 U	NA
Benzene, hydroxy-	NE	13000 U	13000 U	13000 U	13000 U	7300 U	13000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	7300 U	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	7300 U	NA
Carbazole	NE	NA	NA	NA	NA	7300 U	NA
Dibenzofuran	6200	1800 U	6000	2000 U	2800	7300 U	**6400 J**
Di-n-butylphthalate	8100	NA	NA	NA	NA	7300 U	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	7300 U	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	7300 U	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-49		RPSB-50		RPSB-51	
		2-4 RPSB-49 (2-4) 12/08/1999	8-10 RPSB-49 (8-10) 12/08/1999	5-7 RPSB-50 (5-7) 12/09/1999	7-9 RPSB-50 (7-9) 12/09/1999	5-7 RPSB-51 (5-7) 01/10/2000	10-12 RPSB-51 (10-12) 01/10/2000
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	776	NA
Antimony	NE*	NA	NA	NA	NA	0.21 U	NA
Arsenic	7.5	2.1	2.1	5.4	1.2	4	1.6
Barium	300	51.6	18.6	95.5	16.6 B	9.5 B	8.6 B
Beryllium	0.16	NA	NA	NA	NA	0.21 U	NA
Cadmium	1	0.88	0.96	**1.5**	**1.1**	0.47 B	0.43 B
Calcium	NE*	NA	NA	NA	NA	577	NA
Chromium	10	9.6	1.8 B	5.7	2.6	2.7	4.2
Cobalt	30	NA	NA	NA	NA	1.7 B	NA
Copper	25	NA	NA	NA	NA	12.2	NA
Iron	2000	NA	NA	NA	NA	**3720**	NA
Lead	NE*	122	32.2	217	22.3	147	8.2
Magnesium	NE*	NA	NA	NA	NA	139	NA
Manganese	NE*	NA	NA	NA	NA	13.8	NA
Mercury	0.1	**0.16**	0.017 U	**0.35**	**0.14**	**0.13**	0.024 B
Nickel	13	NA	NA	NA	NA	7.5 E	NA
Potassium	NE*	NA	NA	NA	NA	114	NA
Selenium	2	0.37 U	**4.9**	**9**	2	1.4 B	0.43 U
Silver	NE*	0.57 B	0.46 B	1 B	3.7	0.52 B	0.4 B
Sodium	NE*	NA	NA	NA	NA	15.6 U	NA
Thallium	NE*	NA	NA	NA	NA	0.71 B	NA
Vanadium	150	NA	NA	NA	NA	40.1	NA
Zinc	20	NA	NA	NA	NA	**21.3**	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.87 B	3.2	0.79 B	0.16 B	0.048 B	0.062 B
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	36 U	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	36 U	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	36 U	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	5.4	NA
4,4'-DDE	2100	NA	NA	NA	NA	3.6 U	NA
4,4'-DDT	2100	NA	NA	NA	NA	3.6 U	NA
Aldrin	2900	NA	NA	NA	NA	1.9 U	NA
alpha-BHC	110	NA	NA	NA	NA	1.9 U	NA
alpha-Chlordane	5400	NA	NA	NA	NA	1.9 U	NA
beta-BHC	200	NA	NA	NA	NA	3.2	NA
delta-BHC	300	NA	NA	NA	NA	3.8	NA
Dieldrin	44	NA	NA	NA	NA	3.6 U	NA
Endosulfan I	900	NA	NA	NA	NA	1.9 U	NA
Endosulfan II	900	NA	NA	NA	NA	6.1	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	3.6 U	NA
Endrin	100	NA	NA	NA	NA	3.6 U	NA
Endrin aldehyde	NE	NA	NA	NA	NA	3.6 U	NA
Endrin ketone	NE	NA	NA	NA	NA	3.6 U	NA
gamma-Chlordane	540	NA	NA	NA	NA	1.9 U	NA
Heptachlor	100	NA	NA	NA	NA	1.9 U	NA
Heptachlor epoxide	20	NA	NA	NA	NA	1.9 U	NA
Lindane	NE	NA	NA	NA	NA	1.9 U	NA
Methoxychlor	NE	NA	NA	NA	NA	19 U	NA
Toxaphene	NE	NA	NA	NA	NA	190 U	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-67		RPSB-68		RPSB-69	
		2-4 RPSB-67 (2-4) 10/11/1999	10-12 RPSB-67 (10-12) 10/11/1999	6-8 RPSB-68 (6-8) 10/11/1999	8-10 RPSB-68 (8-10) 10/11/1999	6-8 RPSB-69 (6-8) 10/12/1999	10-12 RPSB-69 (10-12) 10/12/1999
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**42**	0.052 J	0.053 J	0.12 J	0.095 J	0.065 J
Benzo(a)pyrene	0.061	**17 J**	0.051 J	0.39 U	**0.089 J**	**0.170 J**	0.41 U
Benzo(b)fluoranthene	1.1	**23 J**	0.047 J	0.076 J	0.12 J	0.120 J	0.41 U
Benzo(k)fluoranthene	1.1	**9.4**	0.39 U	0.042 J	0.049 J	0.049 J	0.41 U
Chrysene	0.4	**47**	0.064 J	0.087 J	0.15 J	0.110 J	0.089 J
Dibenzo(a,h)anthracene	0.014	**2.8 J**	0.39 U	0.39 U	0.38 U	0.41 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	**7.4**	0.39 U	0.047 J	0.064 J	0.040 J	0.41 U
Total Carcinogenic PAHs		148.6	0.214	0.305	0.592	0.584	0.154
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.22 J	0.39 U	0.39 U	0.38 U	0.41 U	0.41 U
Acenaphthene	50	0.34 U	0.39 U	0.39 U	0.38 U	0.41 U	0.41 U
Acenaphthylene	41	14	0.39 U	0.1 J	0.38 U	0.41 U	0.049 J
Anthracene	50	5.7	0.39 U	0.39 U	0.043 J	0.41 U	0.41 U
Benzo(g,h,i)perylene	50	9.3	0.39 U	0.06 J	0.086 J	0.048 J	0.41 U
Fluoranthene	50	60	0.065 J	0.05 J	0.13 J	0.120 J	0.095 J
Fluorene	50	2.5	0.39 U	0.39 U	0.38 U	0.41 U	0.41 U
Naphthalene	13	0.12 J	0.39 U	0.39 U	0.38 U	0.41 U	0.41 U
Phenanthrene	50	7.7	0.048 J	0.39 U	0.071 J	0.047 J	0.41 U
Pyrene	50	**94**	0.087 J	0.098 J	0.22 J	0.180 J	0.12 J
Total Non-Carcinogenic PAHs		193.5	0.2	0.308	0.55	0.395	0.264
Total PAHs		342.1	0.414	0.613	1.142	0.979	0.418
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	340 U	390 U	390 U	380 U	410 U	410 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-67		RPSB-68		RPSB-69	
		2-4	10-12	6-8	8-10	6-8	10-12
		RPSB-67 (2-4)	RPSB-67 (10-12)	RPSB-68 (6-8)	RPSB-68 (8-10)	RPSB-69 (6-8)	RPSB-69 (10-12)
		10/11/1999	10/11/1999	10/11/1999	10/11/1999	10/12/1999	10/12/1999
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	1.2	0.47 B	0.82 B	0.43 B	1.7	1.2
Barium	300	3.2 B	3.6 B	6.7 B	6.4 B	10.5	9.6 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.19 U	0.23 U	0.2 U	0.23 U	0.21 U	0.3 B
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	1.4 B	2.7	2.5	3.3	4	8.2
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	2	1 B	4.7	3.1	26.2	8.5
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.052 U	0.057 U	0.047 U	0.059 U	0.058 U	0.054 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.38 U	0.45 U	0.4 U	0.45 U	0.43 U	0.42 U
Silver	NE*	0.28 U	0.34 U	0.3 U	0.34 U	0.32 U	0.32 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.8 B	0.87 B	0.11 B	2.8	0.94	0.97
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-90	RPSB-91	RPSB-92	TP-06B	TP-06B
		4-6	6-8	4-6	4.5-5	4.5-5.5
		RPSB-90 (4-6)	RPSB91 (6-8)	RPSB-92 (4-6)	RPTP6 (4.5-5)	RPTP-6 (4.5-5.5)
		11/02/2001	11/01/2001	10/29/2001	10/24/1995	10/26/1995
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.001 U	**170**	**361**
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	**1800**	**209**
Toluene	1.5	0.001 U	0.001 U	0.001 U	**1480**	**984**
Xylene (total)	1.2	0.004	0.006	0.01	**420**	**825**
Total BTEX		0.004	0.006	0.01	3870	2379
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	40000 U	NA
2-Hexanone	NE	NA	NA	NA	40000 U	NA
Acetone	200	NA	NA	NA	**13000 J**	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	796000	519000
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	20000 U	NA
Chlorobenzene	1700	NA	NA	NA	20000 U	NA
Methylene chloride	100	NA	NA	NA	20000 U	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	260000	1230000
Tetrachloroethene	1400	NA	NA	NA	20000 U	NA
Trichloroethene	700	NA	NA	NA	20000 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.34 U	0.33 U	**20**	**410 D**	**493**
Benzo(a)pyrene	0.061	0.34 U	0.33 U	**25**	**370 JD**	**458**
Benzo(b)fluoranthene	1.1	0.34 U	0.33 U	**26**	**160 JD**	**206**
Benzo(k)fluoranthene	1.1	0.34 U	0.33 U	**8**	**210 JD**	**290**
Chrysene	0.4	0.34 U	0.33 U	**19**	**420 D**	**478**
Dibenzo(a,h)anthracene	0.014	0.34 U	0.33 U	**3.5 J**	**19.3**	**55**
Indeno(1,2,3-cd)pyrene	3.2	0.34 U	0.33 U	**10**	**76.1**	**151**
Total Carcinogenic PAHs		0	0	111.5	1665.4	2131
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.34 U	0.33 U	3.5 U	**3700 D**	**5750**
Acenaphthene	50	0.34 U	0.33 U	0.43 J	**200 JD**	**556**
Acenaphthylene	41	0.34 U	0.33 U	10	**1100 D**	**1590**
Anthracene	50	0.34 U	0.33 U	4.4	**630 D**	**921**
Benzo(g,h,i)perylene	50	0.34 U	0.33 U	10	**104**	**209**
Fluoranthene	50	0.34 U	0.33 U	26	**740 D**	**929**
Fluorene	50	0.34 U	0.33 U	3.5 U	**770 D**	**1040**
Naphthalene	13	0.34 U	0.33 U	3.5 U	**4800 D**	**7130**
Phenanthrene	50	0.34 U	0.33 U	12	**2600 D**	**3150**
Pyrene	50	0.34 U	0.33 U	34	**1200 D**	**1520**
Total Non-Carcinogenic PAHs		0	0	96.83	15844	22795
Total PAHs		0	0	208.33	17509.4	24926
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	380000 U	NA
1-Methyl naphthalene	NE	NA	NA	NA	411	3160
2,4-Dimethylphenol	NE	NA	NA	NA	380000 U	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	380000 U	NA
2-Methylphenol	1000	NA	NA	NA	380000 U	NA
4-Methylphenol	900	NA	NA	NA	380000 U	NA
Benzene, hydroxy-	NE	NA	NA	NA	380000 U	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	380000 U	NA
Butylbenzylphthalate	50000	NA	NA	NA	380000 U	NA
Carbazole	NE	NA	NA	NA	380000 U	NA
Dibenzofuran	6200	340 U	330 U	3500 U	**34200**	**327000**
Di-n-butylphthalate	8100	NA	NA	NA	380000 U	NA
Di-n-octylphthalate	50000	NA	NA	NA	380000 U	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	380000 U	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-90	RPSB-91	RPSB-92	TP-06B	TP-06B
		4-6	6-8	4-6	4.5-5	4.5-5.5
		RPSB-90 (4-6)	RPSB91 (6-8)	RPSB-92 (4-6)	RPTP6 (4.5-5)	RPTP-6 (4.5-5.5)
		11/02/2001	11/01/2001	10/29/2001	10/24/1995	10/26/1995
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	6.7 *	2.7 *	0.94	NA	NA
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	6400	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	67	NA
p-Cresol (TCLP)	NE	NA	NA	NA	88	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	6.0 U	NA
Barium (TCLP)	NE	NA	NA	NA	894 B	NA
Cadmium (TCLP)	NE	NA	NA	NA	1 U	NA
Chromium (TCLP)	NE	NA	NA	NA	7 U	NA
Lead (TCLP)	NE	NA	NA	NA	18.8 B	NA
Selenium (TCLP)	NE	NA	NA	NA	7.8 B	NA
Silver (TCLP)	NE	NA	NA	NA	2 U	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		TP-08B	TP-10B	TP-12B	TP-13B	TP-14B
		6.5-7	10-11	8-10	2-3	2-4
		RPTP-8 (6.5-7.0)	RPTP-10 (10-11)	RPTP-12 (8-10)	RPTP-13 (2-3)	RPTP-14 (2-4)
		10/26/1995	10/26/1995	10/25/1995	10/25/1995	10/24/1995
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	**10.7**	0.12 U	0.22 U	**40.3**	**1.3**
Ethyl benzene	5.5	**68.7**	0.12 U	0.45	**276**	**99.1**
Toluene	1.5	**18.8**	0.12 U	0.08 J	**117**	**3.97**
Xylene (total)	1.2	**73.1**	NA	**2.01**	**477**	**38.2**
Total BTEX		171.3	0	2.54	910.3	142.57
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	61000	120 U	1500	1290 U	92800
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	16400	120 U	960	1930000	109000
Tetrachloroethene	1400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**184**	0.12 U	**1.09**	**442**	**59.5**
Benzo(a)pyrene	0.061	**146**	0.12 U	**0.67**	**161**	**47.6**
Benzo(b)fluoranthene	1.1	**69.2**	0.12 U	0.26	1.29 U	**20.8**
Benzo(k)fluoranthene	1.1	**103**	0.12 U	0.45	**285**	**29.8**
Chrysene	0.4	**194**	0.12 U	**0.97**	**498**	**59.1**
Dibenzo(a,h)anthracene	0.014	**19.7**	0.12 U	0.22 U	**7.04**	**5.31**
Indeno(1,2,3-cd)pyrene	3.2	**66**	0.12 U	0.14 J	**19**	**19**
Total Carcinogenic PAHs		781.9	0	3.58	1412.04	241.11
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	**833**	0.36	28.1	**3240**	**364**
Acenaphthene	50	**240**	0.12 U	2.96	**695**	**162**
Acenaphthylene	41	**77.3**	0.20	8.22	**682**	**145**
Anthracene	50	**276**	0.06 J	3.36	**689**	**109**
Benzo(g,h,i)perylene	50	**96.8 J**	0.12 U	0.15 J	18.5	22.2
Fluoranthene	50	**312**	0.12 U	1.71	**685**	**112**
Fluorene	50	**310**	0.07 J	5.05	**402**	**136**
Naphthalene	13	**960**	1.33	**51.1**	**2630**	**707 E**
Phenanthrene	50	**950**	0.18	10.8	**2700**	**285**
Pyrene	50	**521**	0.04 J	2.59	**967**	**174**
Total Non-Carcinogenic PAHs		4576.1	2.24	114.04	12708.5	2216.2
Total PAHs		5358	2.24	117.62	14120.54	2457.31
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	541	0.26	18.3	2250	270
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	**53100**	120 U	1090	**127000**	**23400**
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		TP-08B	TP-10B	TP-12B	TP-13B	TP-14B
		6.5-7	10-11	8-10	2-3	2-4
		RPTP-8 (6.5-7.0)	RPTP-10 (10-11)	RPTP-12 (8-10)	RPTP-13 (2-3)	RPTP-14 (2-4)
		10/26/1995	10/26/1995	10/25/1995	10/25/1995	10/24/1995
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	NA	NA	NA	152	NA
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		TP-15B	TP-21B	TP-22B	TP-23B
		0-2	4-6	11.513	10-11
		RPTP15 (0-2)	RPTP-21 (4-6)	RPTP22 (11.5-13)	RPTP-23 (10-11)
		10/24/1995	10/24/1995	10/26/1995	10/26/1995
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	**4.21**	**2.37**	0.011	**0.15 J**
Ethyl benzene	5.5	**116**	**26.1**	1.2	0.91
Toluene	1.5	**6.08**	0.87 J	0.32	0.13 J
Xylene (total)	1.2	7.35	**16.4**	0.74	1.01
Total BTEX		133.64	45.74	2.27	2.2
Other Volatile Organic Compounds (ug/kg)					
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA
2-Butanone	300	8000 U	NA	10 U	NA
2-Hexanone	NE	8000 U	NA	10 U	NA
Acetone	200	8000 U	NA	6 J	NA
Benzene, 1,2,4-trimethyl	NE	19800	93200	150 U	1860
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA
Carbon disulfide	2700	4000 U	NA	6 U	NA
Chlorobenzene	1700	4000 U	NA	6 U	NA
Methylene chloride	100	4000 U	NA	6 U	NA
n-Butylbenzene	NE	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA
Styrene	NE	128000	34000	650	240
Tetrachloroethene	1400	4000 U	NA	6 U	NA
Trichloroethene	700	4000 U	NA	6 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**144**	**130**	**24.2**	**5.6**
Benzo(a)pyrene	0.061	**108**	**98.8**	**21.6**	**5.03**
Benzo(b)fluoranthene	1.1	**76.3**	**37.4**	**8.52**	**2.22**
Benzo(k)fluoranthene	1.1	**94.7**	**62.4**	**12.7**	**3.07**
Chrysene	0.4	**168**	**123**	**24.3**	**6.15**
Dibenzo(a,h)anthracene	0.014	**15.1**	**12.5**	**2.32**	**0.93**
Indeno(1,2,3-cd)pyrene	3.2	**46**	**39.5**	**8.73**	**6.68**
Total Carcinogenic PAHs		652.1	503.6	102.37	29.68
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	**88.7**	**1870**	2.55	6.28
Acenaphthene	50	**94.9**	**388**	23.5	25.3
Acenaphthylene	41	**126**	**69.6**	8.56	0.18 U
Anthracene	50	**142**	**215**	37.3	0.18 U
Benzo(g,h,i)perylene	50	**54**	42.2	13.2	4.56 J
Fluoranthene	50	**216**	**202**	45.5	9.05
Fluorene	50	**143**	**295**	42.1	17.1
Naphthalene	13	**116**	**1850**	1.54	0.18 U
Phenanthrene	50	**412**	**766**	**75**	15.0
Pyrene	50	**435**	**337**	**70.3**	27.1
Total Non-Carcinogenic PAHs		1827.6	6034.8	319.6	104.39
Total PAHs		2479.7	6538.4	421.97	134.07
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	17000 U	NA	8600 U	NA
1-Methyl naphthalene	NE	276	1190	10.4	21.9
2,4-Dimethylphenol	NE	17000 U	NA	8600 U	NA
2,4-Dinitrotoluene	NE	17000 U	NA	8600 U	NA
2-Methylphenol	1000	17000 U	NA	8600 U	NA
4-Methylphenol	900	17000 U	NA	8600 U	NA
Benzene, hydroxy-	NE	17000 U	NA	8600 U	NA
Bis(2-ethylhexyl)phthalate	50000	17000 U	NA	8600 U	NA
Butylbenzylphthalate	50000	17000 U	NA	8600 U	NA
Carbazole	NE	17000 U	NA	8600 U	NA
Dibenzofuran	6200	**28600**	**37800**	6000	2430
Di-n-butylphthalate	8100	17000 U	NA	8600 U	NA
Di-n-octylphthalate	50000	17000 U	NA	8600 U	NA
N-Nitrosodiphenylamine (1)	NE	17000 U	NA	8600 U	NA
p-Cymene	NE	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		TP-15B	TP-21B	TP-22B	TP-23B
		0-2	4-6	11.513	10-11
		RPTP15 (0-2)	RPTP-21 (4-6)	RPTP22 (11.5-13)	RPTP-23 (10-11)
		10/24/1995	10/24/1995	10/26/1995	10/26/1995
Metals (mg/kg)					
Aluminum	NE*	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	NA	NA	NA	NA
PCBs (ug/kg)					
Aroclor 1242	1000/10000	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA
Pesticides (ug/kg)					
4,4'-DDD	2900	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA
TCLP					
TCLP Benzene (ug/l)					
Benzene (TCLP)	NE	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)					
o-Cresol (TCLP)	NE	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA
TCLP Metals (ug/l)					
Arsenic (TCLP)	NE	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA

Table 4-1 (continued)
Soil Analytical Results
Former Gas Works Area (0-12 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-2
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		PZ-01	PZ-05		PZ-08	RPMW-07D2
		13.00	13.00	23.00	13.00	23-24
		RP-SBO1-02	RP-SB03-01	RP-SB03-02	RP-SBO2-02	RPMW-0702 (23-24)
		10/24/1995	10/25/1995	10/25/1995	10/24/1995	08/14/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	**2.54**	**25**	**15.5**	**87.3**	**1.2**
Ethyl benzene	5.5	**13.4**	**250**	**123**	**131**	**23**
Toluene	1.5	1.05	16 U	**1.93**	**15.5**	0.54 UJ
Xylene (total)	1.2	12.6	NA	150.2	234	**8.1**
Total BTEX		29.59	275	290.63	467.8	32.3
Other Volatile Organic Compounds (ug/kg)						
Benzene, 1,2,4-trimethyl	NE	13100	NA	40100	118000	NA
Styrene	NE	140 U	16000 U	120 U	270 U	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)pyrene	0.061	**12.4**	**100 D**	**38.8**	**109**	**37**
Benzo(b)fluoranthene	1.1	**4.88**	**43 JD**	**17.8**	**49.7**	**27**
Benzo(a)anthracene	0.224	**16.8**	**120 D**	**48**	**162**	**52**
Benzo(k)fluoranthene	1.1	**7.83**	**60 JD**	**24.9**	**72.6**	**10 J**
Chrysene	0.4	**15.7**	**120 D**	**44.7**	**142**	**55**
Dibenzo(a,h)anthracene	0.014	**1.24**	**84 U**	**4.03 J**	**12.6**	**3.5 J**
Indeno(1,2,3-cd)pyrene	3.2	**4.23**	**33 JD**	**16.2**	**41.5**	**10 J**
Total Carcinogenic PAHs		63.08	560	194.43	589.4	194.5
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	**140**	**370 D**	**162**	**972**	**140**
Acenaphthene	50	**79.9**	**270 D**	**99.3**	**265**	**150**
Acenaphthylene	41	6.57	22 JD	20.9	**63.9**	17 J
Anthracene	50	29.4	**170 D**	**66.2**	**180**	**86**
Benzo(g,h,i)perylene	50	4.45	43 JD	21.0	46.6	13 J
Fluoranthene	50	27.8	**270 D**	**87.9**	**248**	**91**
Fluorene	50	43.3	**190 D**	**60.1**	**249**	**120**
Naphthalene	13	**249**	**870 D**	**351**	**2580 E**	**280**
Phenanthrene	50	**108**	**670 D**	**224**	**758**	**250**
Pyrene	50	46.7	**350 D**	**127**	**376**	**160**
Total Non-Carcinogenic PAHs		735.12	3225	1219.4	5738.5	1307
Total PAHs		798.2	3785	1413.83	6327.9	1501.5
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	84000 U	NA	NA	NA
1-Methyl naphthalene	NE	111	NA	97.7	556	NA
2,4-Dimethylphenol	NE	NA	84000 U	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	84000 U	NA	NA	NA
2-Methylphenol	100	NA	84000 U	NA	NA	NA
4-Methylphenol	900	NA	84000 U	NA	NA	NA
Benzene, hydroxy-	NE	NA	84000 U	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	84000 U	NA	NA	NA
Butylbenzylphthalate	50000	NA	84000 U	NA	NA	NA
Carbazole	NE	NA	84000 U	NA	NA	NA
Dibenzofuran	6200	5510	**20000 JD**	**10800**	**26500**	**9500 J**
Di-n-butylphthalate	8100	NA	84000 U	NA	NA	NA
Di-n-octylphthalate	50000	NA	84000 U	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	84000 U	NA	NA	NA

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		PZ-01	PZ-05		PZ-08	RPMW-07D2
		13.00	13.00	23.00	13.00	23-24
		RP-SBO1-02	RP-SB03-01	RP-SB03-02	RP-SBO2-02	RPMW-0702 (23-24)
		10/24/1995	10/25/1995	10/25/1995	10/24/1995	08/14/2002
Metals (mg/kg)						
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	NA	NA	NA	NA	0.41

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-09	RPSB-10	RPSB-11	RPSB-119	
		20-22	18-20	15-17	14-17	14-17 (Dup)
		RPSB-09 (20-22)	RPSB-10 (18-20)	RPSB-11 (15-17)	RPSB-119 (14-17)	RPSBXX-082302-1
		01/07/2000	12/28/1999	12/17/1999	08/23/2002	08/23/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	**5.7**	**15**	**13**
Ethyl benzene	5.5	0.002	0.001 U	**66**	**180**	**120**
Toluene	1.5	0.007	0.001 U	1.2 U	2.9 U	1.2 U
Xylene (total)	1.2	0.019	0.001 U	**36**	**120**	**94**
Total BTEX		0.028	0	107.7	315	227
Other Volatile Organic Compounds (ug/kg)						
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)pyrene	0.061	**0.15 J**	**0.1 J**	**6.7 J**	**64 J**	**72 J**
Benzo(b)fluoranthene	1.1	0.14 J	0.097 J	**5.2 J**	**49 J**	**56 J**
Benzo(a)anthracene	0.224	0.21 J	0.18 J	**9.2 J**	**80 J**	**38 J**
Benzo(k)fluoranthene	1.1	0.063 J	0.048 J	**2 J**	**23 J**	**26 J**
Chrysene	0.4	0.21 J	0.15 J	**6.7 J**	**82 J**	**71 J**
Dibenzo(a,h)anthracene	0.014	0.39 U	0.42 U	10 U	99 U	100 U
Indeno(1,2,3-cd)pyrene	3.2	0.083 J	0.42 U	1.5 J	**15 J**	**12 J**
Total Carcinogenic PAHs		0.856	0.575	31.3	313	275
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.31 J	0.17 J	**68**	**670**	**590**
Acenaphthene	50	0.11 J	0.34 J	27	**350**	**330**
Acenaphthylene	41	0.074 J	0.059 J	6.5 J	29 J	26 J
Anthracene	50	0.26 J	0.18 J	15	**180**	**160**
Benzo(g,h,i)perylene	50	0.092 J	0.05 J	1.7 J	16 J	15 J
Fluoranthene	50	0.42	0.33 J	16	**190**	**170**
Fluorene	50	0.22 J	0.22 J	21	**240**	**220**
Naphthalene	13	0.42	0.5	**170**	**1300**	**1100**
Phenanthrene	50	0.98	0.73	**62**	**650**	**570**
Pyrene	50	0.61	0.6	26	**280**	**250**
Total Non-Carcinogenic PAHs		3.496	3.179	413.2	3905	3431
Total PAHs		4.352	3.754	444.5	4218	236
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	12000 U	13000 U	12000 U	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	390 U	420 U	1800 J	**18000 J**	**16000 J**
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-09	RPSB-10	RPSB-11	RPSB-119	
		20-22	18-20	15-17	14-17	14-17 (Dup)
		RPSB-09 (20-22)	RPSB-10 (18-20)	RPSB-11 (15-17)	RPSB-119 (14-17)	RPSBXX-082302-1
		01/07/2000	12/28/1999	12/17/1999	08/23/2002	08/23/2002
Metals (mg/kg)						
Arsenic	7.5	0.29 U	0.35 U	1.6	NA	NA
Barium	300	1.4 B	1.3 B	12.9 B	NA	NA
Cadmium	1	0.19 U	0.24 U	0.21 B	NA	NA
Chromium	10	1.3 B	0.92 B	3.4	NA	NA
Lead	NE*	1	0.64 B	7.8	NA	NA
Mercury	0.1	0.018 U	0.021 U	0.017 U	NA	NA
Selenium	2	0.38 U	0.47 U	0.41 U	NA	NA
Silver	NE*	0.29 U	0.35 U	0.36 B	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.036 U	0.036 U	0.12 B	0.27 U	0.31 U

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-12	RPSB-121	RPSB-123	RPSB-124
		14-16	20.5-21	16-26	17-27
		RPSB-12 (14-16)	RPSB-121 (20.5-21)	RPSB-123 (16-26)	RPSB-124 (17-27)
		12/27/1999	08/15/2002	08/12/2002	08/19/2002
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	**490**	**73**	2.8 UJ	0.001 U
Ethyl benzene	5.5	**890**	**380**	**180**	0.001 U
Toluene	1.5	**94**	5.8 U	2.8 U	0.001 U
Xylene (total)	1.2	**1000**	**340**	**220**	0.002
Total BTEX		2474	793	400	0.002
Other Volatile Organic Compounds (ug/kg)					
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)pyrene	0.061	**350 J**	**160 J**	**47 J**	0.38 U
Benzo(b)fluoranthene	1.1	**280 J**	**120 J**	**37 J**	0.38 U
Benzo(a)anthracene	0.224	**520 J**	**240 J**	**70**	0.38 U
Benzo(k)fluoranthene	1.1	**110 J**	**50 J**	**18 J**	0.38 U
Chrysene	0.4	**470 J**	**230 J**	**80**	0.38 U
Dibenzo(a,h)anthracene	0.014	590 U	390 U	57 U	0.38 U
Indeno(1,2,3-cd)pyrene	3.2	**110 J**	390 U	**18 J**	0.38 U
Total Carcinogenic PAHs		1840	800	270	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	**3300**	**1800**	**520**	0.38 U
Acenaphthene	50	**1800**	**920**	**120**	0.38 U
Acenaphthylene	41	**180 J**	**68 J**	26 J	0.38 U
Anthracene	50	**900**	**370 J**	**84**	0.38 U
Benzo(g,h,i)perylene	50	**130 J**	43 J	20 J	0.38 U
Fluoranthene	50	**940**	**470**	**120**	0.38 U
Fluorene	50	**1000**	**630**	**180**	0.38 U
Naphthalene	13	**6800**	**4200**	**780**	0.38 U
Phenanthrene	50	**3200**	**1800**	**400**	0.054 J
Pyrene	50	**1400**	**730**	**220**	0.049 J
Total Non-Carcinogenic PAHs		19650	11031	2470	0.103
Total PAHs		21490	11831	2740	0.103
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	23000	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	**85000 J**	**57000 J**	**19000 J**	380 U
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-12	RPSB-121	RPSB-123	RPSB-124
		14-16	20.5-21	16-26	17-27
		RPSB-12 (14-16)	RPSB-121 (20.5-21)	RPSB-123 (16-26)	RPSB-124 (17-27)
		12/27/1999	08/15/2002	08/12/2002	08/19/2002
Metals (mg/kg)					
Arsenic	7.5	4.4	NA	NA	NA
Barium	300	4.7 B	NA	NA	NA
Cadmium	1	0.23 U	NA	NA	NA
Chromium	10	2.9	NA	NA	NA
Lead	NE*	19.6	NA	NA	NA
Mercury	0.1	0.041 B	NA	NA	NA
Selenium	2	0.48 B	NA	NA	NA
Silver	NE*	0.8 B	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	2.5	0.29 U	0.33 B	0.24 UJ

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-21	RPSB-23	RPSB-30	RPSB-31B
		23-25	12-14	19-21	22-24
		RPSB-21 (23-25)	RPSB-23 (12-14)	RPSB-30 (19-21)	RPSB-31B (22-24)
		12/15/1999	01/04/2000	02/01/2000	01/12/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	**16**	0.002 J	0.001 U
Ethyl benzene	5.5	0.001 U	**150**	0.011	0.001 U
Toluene	1.5	0.001 U	**21**	0.001 J	0.001 U
Xylene (total)	1.2	0.001 U	**240**	0.004	0.004
Total BTEX		0	427	0.018	0.004
Other Volatile Organic Compounds (ug/kg)					
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)pyrene	0.061	0.4 U	**9 DJ**	**0.15 J**	0.39 U
Benzo(b)fluoranthene	1.1	0.4 U	**7.3 DJ**	0.16 J	0.39 U
Benzo(a)anthracene	0.224	0.4 U	**15 DJ**	0.21 J	0.39 U
Benzo(k)fluoranthene	1.1	0.4 U	**3**	0.055 J	0.39 U
Chrysene	0.4	0.4 U	**12 DJ**	0.27 J	0.39 U
Dibenzo(a,h)anthracene	0.014	0.4 U	**2.1**	0.41 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	**47 U**	0.41 U	0.39 U
Total Carcinogenic PAHs		0	48.4	0.845	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.4 U	**99 D**	0.21 J	0.39 U
Acenaphthene	50	0.4 U	30 DJ	0.11 J	0.39 U
Acenaphthylene	41	0.4 U	5.5 DJ	0.07 J	0.39 U
Anthracene	50	0.4 U	21 DJ	0.42	0.39 U
Benzo(g,h,i)perylene	50	0.4 U	47 U	0.067 J	0.39 U
Fluoranthene	50	0.4 U	31 DJ	0.4 J	0.057 J
Fluorene	50	0.4 U	28 DJ	0.33 J	0.39 U
Naphthalene	13	0.4 U	**230 D**	0.23 J	0.39 U
Phenanthrene	50	0.4 U	**96 D**	1.1	0.096 J
Pyrene	50	0.4 U	42 DJ	0.72	0.085 J
Total Non-Carcinogenic PAHs		0	582.5	3.657	0.238
Total PAHs		0	630.9	4.502	0.238
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	15000 U	12000 U	12000 U	13000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	400 U	**6900 E**	410 U	390 U
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-21	RPSB-23	RPSB-30	RPSB-31B
		23-25	12-14	19-21	22-24
		RPSB-21 (23-25)	RPSB-23 (12-14)	RPSB-30 (19-21)	RPSB-31B (22-24)
		12/15/1999	01/04/2000	02/01/2000	01/12/2000
Metals (mg/kg)					
Arsenic	7.5	0.31 U	0.5 B	0.3 U	0.24 U
Barium	300	2 B	2.5 B	1.9 B	1.2 B
Cadmium	1	0.21 U	0.24 U	0.2 U	0.16 U
Chromium	10	1 B	1.8 B	3.5	1.1 B
Lead	NE*	0.5 B	3.9	0.33 B	0.55 B
Mercury	0.1	0.018 U	0.019 U	0.02 U	0.018 U
Selenium	2	0.42 U	0.48 B	0.4 U	0.32 U
Silver	NE*	0.31 U	0.36 U	0.3 U	0.24 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.28 B	0.06 U	0.093 U	0.13 B

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-67	RPSB-68	RPSB-69	RPSB-90
		12-14	14-16	14-16	16-18
		RPSB-67 (12-14)	RPSB-68 (14-16)	RPSB-69 (14-16)	RPSB-90 (16-18)
		10/11/1999	10/11/1999	10/12/1999	11/02/2001
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.001 U	0.016	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.062	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.14	0.001
Xylene (total)	1.2	0.001 U	0.002	0.079	0.01
Total BTEX		0	0.002	0.297	0.011
Other Volatile Organic Compounds (ug/kg)					
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)pyrene	0.061	0.41 U	0.38 U	0.42 U	0.42 U
Benzo(b)fluoranthene	1.1	0.41 U	0.38 U	0.42 U	0.42 U
Benzo(a)anthracene	0.224	0.41 U	0.38 U	0.42 U	0.42 U
Benzo(k)fluoranthene	1.1	0.41 U	0.38 U	0.42 U	0.42 U
Chrysene	0.4	0.41 U	0.38 U	0.42 U	0.42 U
Dibenzo(a,h)anthracene	0.014	0.41 U	0.38 U	0.42 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.38 U	0.42 U	0.42 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.41 U	0.38 U	0.42 U	0.42 U
Acenaphthene	50	0.41 U	0.38 U	0.42 U	0.25 J
Acenaphthylene	41	0.41 U	0.38 U	0.42 U	0.42 U
Anthracene	50	0.41 U	0.38 U	0.42 U	0.42 U
Benzo(g,h,i)perylene	50	0.41 U	0.38 U	0.42 U	0.42 U
Fluoranthene	50	0.41 U	0.38 U	0.42 U	0.06 J
Fluorene	50	0.41 U	0.38 U	0.42 U	0.26 J
Naphthalene	13	0.41 U	0.041 J	0.054 J	0.42 U
Phenanthrene	50	0.41 U	0.38 U	0.42 U	0.42 U
Pyrene	50	0.41 U	0.38 U	0.42 U	0.076 J
Total Non-Carcinogenic PAHs		0	0.041	0.054	0.646
Total PAHs		0	0.041	0.054	0.646
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	410 U	380 U	420 U	420 U
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA

Table 4-2 (continued)
Soil Analytical Results
Former Gas Works Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-67	RPSB-68	RPSB-69	RPSB-90
		12-14	14-16	14-16	16-18
		RPSB-67 (12-14)	RPSB-68 (14-16)	RPSB-69 (14-16)	RPSB-90 (16-18)
		10/11/1999	10/11/1999	10/12/1999	11/02/2001
Metals (mg/kg)					
Arsenic	7.5	0.45 B	0.61 B	0.31 B	NA
Barium	300	2.3 B	1.3 B	0.83 B	NA
Cadmium	1	0.21 U	0.23 U	0.2 U	NA
Chromium	10	2.3	1.9 B	1.3 B	NA
Lead	NE*	1.5	0.4 B	0.3 U	NA
Mercury	0.1	0.055 U	0.05 U	0.053 U	NA
Selenium	2	0.41 U	0.46 U	0.4 U	NA
Silver	NE*	0.31 U	0.34 U	0.3 U	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.35 B	0.056 B	0.8 B	0.4 B*

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-3
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		PZ-01	PZ-05	PZ-08	RPSB-09
		36.00	38.50	39.00	40-42
		RP-SBO1-03	RP-SB03-03	RP-SB02-03	RPSB-09 (40-42)
		10/24/1995	10/25/1995	10/24/1995	01/07/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	**0.44**	**0.89**	**1.1**	0.001 U
Ethyl benzene	5.5	0.79	**7.77**	**6.2**	0.001 U
Toluene	1.5	0.12 J	0.35	0.78	0.001 U
Xylene (total)	1.2	0.68	8.4	**12**	0.001 U
Total BTEX		2.03	17.41	20.08	0
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	2000 U	NA
2-Hexanone	NE	NA	NA	2000 U	NA
Acetone	200	NA	NA	2000 U	NA
Benzene, 1,2,4-trimethyl	NE	350	3350	NA	NA
Carbon disulfide	2700	NA	NA	800 U	NA
Chlorobenzene	1700	NA	NA	800 U	NA
Methylene chloride	100	NA	NA	800 U	NA
Styrene	NE	290 U	130 U	800 U	NA
Tetrachloroethene	1400	NA	NA	800 U	NA
Trichloroethene	700	NA	NA	800 U	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**1.05**	**6.24**	**12 D**	0.41 U
Benzo(a)pyrene	0.061	**0.88**	**5.34**	**8 J**	0.41 U
Benzo(b)fluoranthene	1.1	0.4	**2.3**	**3.1 JD**	0.41 U
Benzo(k)fluoranthene	1.1	0.55	**3.5**	**7.1 JD**	0.41 U
Chrysene	0.4	**1.03**	**5.71**	**12 D**	0.41 U
Dibenzo(a,h)anthracene	0.014	0.29 U	**0.57**	8 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.26 J	2.29	8 U	0.41 U
Total Carcinogenic PAHs		4.17	25.95	42.2	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	5.11	15.8	**65 D**	0.41 U
Acenaphthene	50	3.72	15.1	15 D	0.41 U
Acenaphthylene	41	0.51	2.49	3 J	0.41 U
Anthracene	50	1.58	8.55	14 D	0.042 J
Benzo(g,h,i)perylene	50	0.32	2.80	3.3 JD	0.41 U
Fluoranthene	50	1.81	11.7	22 D	0.1 J
Fluorene	50	2.43	8.82	24 D	0.41 U
Naphthalene	13	11.6	**30.6**	**100 D**	0.41 U
Phenanthrene	50	5.89	31.0	**72 D**	0.23 J
Pyrene	50	2.90	16.7	32 D	0.15 J
Total Non-Carcinogenic PAHs		35.87	143.56	350.3	0.522
Total PAHs		40.04	169.51	392.5	0.522

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		PZ-01	PZ-05	PZ-08	RPSB-09
		36.00	38.50	39.00	40-42
		RP-SBO1-03	RP-SB03-03	RP-SB02-03	RPSB-09 (40-42)
		10/24/1995	10/25/1995	10/24/1995	01/07/2000
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	8000 U	NA
1-Methyl naphthalene	NE	5.6	13.5	NA	NA
2,4-Dimethylphenol	NE	NA	NA	8000 U	NA
2,4-Dinitrotoluene	NE	NA	NA	8000 U	NA
2-Methylphenol	100	NA	NA	8000 U	NA
4-Methylphenol	900	NA	NA	8000 U	NA
Benzene, hydroxy-	NE	NA	NA	8000 U	12000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	8000 U	NA
Butylbenzylphthalate	50000	NA	NA	8000 U	NA
Carbazole	NE	NA	NA	8000 U	NA
Dibenzofuran	6200	340	1590	2100 JD	410 U
Di-n-butylphthalate	8100	NA	NA	8000 U	NA
Di-n-octylphthalate	50000	NA	NA	8000 U	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	8000 U	NA
Metals (mg/kg)					
Arsenic	7.5	NA	NA	NA	0.67 B
Barium	300	NA	NA	NA	2.1 B
Cadmium	1	NA	NA	NA	0.22 U
Chromium	10	NA	NA	NA	5.9
Lead	NE*	NA	NA	NA	0.79 B
Mercury	0.1	NA	NA	NA	0.02 U
Selenium	2	NA	NA	NA	0.44 U
Silver	NE*	NA	NA	NA	0.33 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	NA	NA	NA	0.088 B

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-11	RPSB-118	RPSB-119	RPSB-120
		40-42	26-27	40-47	37-47
		RPSB-11 (40-42)	RPSB-118 (26-27)	RPSB-119 (40-47)	RPSB-120 (37-47)
		12/17/1999	08/16/2002	08/23/2002	08/16/2002
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	**24**	0.034	0.005
Ethyl benzene	5.5	0.042	**270**	0.03	0.025
Toluene	1.5	0.001 U	2.8 U	0.002	0.001 U
Xylene (total)	1.2	0.022	**270**	0.005	0.004
Total BTEX		0.064	564	0.071	0.034
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.074 J	**73 J**	0.41 U	0.41 U
Benzo(a)pyrene	0.061	0.047 J	**62 J**	0.41 U	0.41 U
Benzo(b)fluoranthene	1.1	0.43 U	**43 J**	0.41 U	0.41 U
Benzo(k)fluoranthene	1.1	0.43 U	**25 J**	0.41 U	0.41 U
Chrysene	0.4	0.062 J	**75 J**	0.41 U	0.41 U
Dibenzo(a,h)anthracene	0.014	0.43 U	97 U	0.41 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.43 U	**18 J**	0.41 U	0.41 U
Total Carcinogenic PAHs		0.183	296	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.21 J	**500**	0.41 U	0.41 U
Acenaphthene	50	0.22 J	**260**	0.41 U	0.41 U
Acenaphthylene	41	0.43 U	34 J	0.41 U	0.41 U
Anthracene	50	0.11 J	**120**	0.066 J	0.41 U
Benzo(g,h,i)perylene	50	0.43 U	21 J	0.41 U	0.41 U
Fluoranthene	50	0.17 J	**180**	0.056 J	0.41 U
Fluorene	50	0.18 J	**180**	0.41 U	0.41 U
Naphthalene	13	0.42 J	**1300**	0.41 U	0.41 U
Phenanthrene	50	0.62	**530**	0.15 J	0.096 J
Pyrene	50	0.25 J	**240**	0.079 J	0.41 U
Total Non-Carcinogenic PAHs		2.18	3365	0.351	0.096
Total PAHs		2.363	3661	0.351	0.096

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-11	RPSB-118	RPSB-119	RPSB-120
		40-42	26-27	40-47	37-47
		RPSB-11 (40-42)	RPSB-118 (26-27)	RPSB-119 (40-47)	RPSB-120 (37-47)
		12/17/1999	08/16/2002	08/23/2002	08/16/2002
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	12000 U	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	430 U	**21000 J**	410 U	410 U
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA
Metals (mg/kg)					
Arsenic	7.5	0.72 B	NA	NA	NA
Barium	300	2 B	NA	NA	NA
Cadmium	1	0.19 U	NA	NA	NA
Chromium	10	3	NA	NA	NA
Lead	NE*	0.52 B	NA	NA	NA
Mercury	0.1	0.019 U	NA	NA	NA
Selenium	2	0.38 U	NA	NA	NA
Silver	NE*	0.29 U	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.057 U	0.23 U	0.28 U	0.27 U

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-122	RPSB-124	RPSB-15	
		27-37	27-37	25-27	40-42
		RPSB-122 (27-37)	RPSB-124 (27-37)	RPSB-15 (25-27)	RPSB-15 (40-42)
		08/19/2002	08/19/2002	12/15/1999	12/15/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.002	0.001 J
Toluene	1.5	0.001 U	0.001	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.002	0.002	0.001 J
Total BTEX		0	0.003	0.004	0.002
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.39 U	0.4 U	0.38 U	0.052 J
Benzo(a)pyrene	0.061	0.39 U	0.4 U	0.38 U	0.42 U
Benzo(b)fluoranthene	1.1	0.39 U	0.4 U	0.38 U	0.42 U
Benzo(k)fluoranthene	1.1	0.39 U	0.4 U	0.38 U	0.42 U
Chrysene	0.4	0.39 U	0.4 U	0.38 U	0.42 U
Dibenzo(a,h)anthracene	0.014	0.39 U	0.4 U	0.38 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.4 U	0.38 U	0.42 U
Total Carcinogenic PAHs		0	0	0	0.052
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.39 U	0.4 U	0.38 U	0.42 U
Acenaphthene	50	0.39 U	0.4 U	0.38 U	0.42 U
Acenaphthylene	41	0.39 U	0.4 U	0.38 U	0.42 U
Anthracene	50	0.39 U	0.4 U	0.38 U	0.42 U
Benzo(g,h,i)perylene	50	0.39 U	0.4 U	0.38 U	0.42 U
Fluoranthene	50	0.39 U	0.07 J	0.38 U	0.08 J
Fluorene	50	0.39 U	0.4 U	0.38 U	0.42 U
Naphthalene	13	0.39 U	0.072 J	0.38 U	0.42 U
Phenanthrene	50	0.39 U	0.16 J	0.082 J	0.19 J
Pyrene	50	0.39 U	0.094 J	0.07 J	0.16 J
Total Non-Carcinogenic PAHs		0	0.396	0.152	0.43
Total PAHs		0	0.396	0.152	0.482

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-122	RPSB-124	RPSB-15	
		27-37	27-37	25-27	40-42
		RPSB-122 (27-37)	RPSB-124 (27-37)	RPSB-15 (25-27)	RPSB-15 (40-42)
		08/19/2002	08/19/2002	12/15/1999	12/15/1999
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	15000 U	12000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	390 U	400 U	380 U	420 U
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA
Metals (mg/kg)					
Arsenic	7.5	NA	NA	0.41 B	0.55 B
Barium	300	NA	NA	1.7 B	2.1 B
Cadmium	1	NA	NA	0.18 U	0.16 U
Chromium	10	NA	NA	1.3 B	1.9
Lead	NE*	NA	NA	0.7 B	0.7 B
Mercury	0.1	NA	NA	0.019 U	0.016 U
Selenium	2	NA	NA	0.36 U	0.32 U
Silver	NE*	NA	NA	0.27 U	0.24 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.27 UJ	0.29 UJ	0.13 B	0.036 U

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-16	RPSB-17	RPSB-21	RPSB-23
		30-32	35-37	39-41	36-38
		RPSB-16 (30-32)	RPSB-17 (35-37)	RPSB-21 (39-41)	RPSB-23 (36-38)
		12/07/1999	12/07/1999	12/15/1999	01/06/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.003	0.001 U	0.003
Ethyl benzene	5.5	0.017	0.014	0.001 J	0.007
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 J
Xylene (total)	1.2	0.016	0.021	0.005	0.01
Total BTEX		0.033	0.038	0.006	0.021
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.085 J	0.046 J	0.41 U	0.17 J
Benzo(a)pyrene	0.061	0.06 J	0.4 U	0.41 U	**0.12 J**
Benzo(b)fluoranthene	1.1	0.048 J	0.4 U	0.41 U	0.1 J
Benzo(k)fluoranthene	1.1	0.39 U	0.4 U	0.41 U	0.4 U
Chrysene	0.4	0.078 J	0.045 J	0.41 U	0.14 J
Dibenzo(a,h)anthracene	0.014	0.39 U	0.4 U	0.41 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.4 U	0.41 U	0.042 J
Total Carcinogenic PAHs		0.271	0.091	0	0.572
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.12 J	0.096 J	0.41 U	0.1 J
Acenaphthene	50	0.24 J	0.099 J	0.41 U	0.098 J
Acenaphthylene	41	0.39 U	0.4 U	0.41 U	0.053 J
Anthracene	50	0.11 J	0.065 J	0.41 U	0.18 J
Benzo(g,h,i)perylene	50	0.39 U	0.4 U	0.41 U	0.4 U
Fluoranthene	50	0.18 J	0.14 J	0.41 U	0.29 J
Fluorene	50	0.14 J	0.086 J	0.41 U	0.16 J
Naphthalene	13	0.25 J	0.18 J	0.41 U	0.12 J
Phenanthrene	50	0.58	0.4	0.058 J	0.92
Pyrene	50	0.3 J	0.2 J	0.41 U	0.62
Total Non-Carcinogenic PAHs		1.92	1.266	0.058	2.541
Total PAHs		2.191	1.357	0.058	3.113

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-16	RPSB-17	RPSB-21	RPSB-23
		30-32	35-37	39-41	36-38
		RPSB-16 (30-32)	RPSB-17 (35-37)	RPSB-21 (39-41)	RPSB-23 (36-38)
		12/07/1999	12/07/1999	12/15/1999	01/06/2000
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	15000 U	15000 U	15000 U	12000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	390 U	400 U	410 U	400 U
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA
Metals (mg/kg)					
Arsenic	7.5	0.36 U	0.6 B	1	0.67 B
Barium	300	1.9 B	2.6 B	1.7 B	1.5 B
Cadmium	1	0.24 U	0.24 U	0.2 U	0.2 U
Chromium	10	2.1 B	2.8	2.5	2.8
Lead	NE*	0.96 B	1.1 B	0.68 B	0.86 B
Mercury	0.1	0.019 U	0.02 U	0.017 U	0.02 U
Selenium	2	0.47 U	0.48 U	0.4 U	0.86 B
Silver	NE*	0.36 U	0.36 U	0.3 U	0.3 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.11 B	0.046 U	0.037 U	0.045 U

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-24	RPSB-27	RPSB-28	RPSB-29
		30-32	40-42	38-40	35-37
		RPSB-24 (30-32)	RPSB-27 (40-42)	RPSB-28 (38-40)	RPSB-29 (35-37)
		01/11/2000	12/17/1999	12/30/1999	02/03/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.004	0.001 U	0.002	0.003
Ethyl benzene	5.5	0.069	0.001 U	0.001 U	0.014
Toluene	1.5	0.002	0.001 U	0.001 U	0.004
Xylene (total)	1.2	0.033	0.001 U	0.003	0.032
Total BTEX		0.108	0	0.005	0.053
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.097 J	0.099 J	0.048 J	**0.25 J**
Benzo(a)pyrene	0.061	**0.066 J**	**0.078 J**	0.4 U	**0.19 J**
Benzo(b)fluoranthene	1.1	0.057 J	0.056 J	0.4 U	0.15 J
Benzo(k)fluoranthene	1.1	0.39 U	0.4 U	0.4 U	0.06 J
Chrysene	0.4	0.087 J	0.096 J	0.042 J	0.24 J
Dibenzo(a,h)anthracene	0.014	0.39 U	0.4 U	0.4 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.4 U	0.4 U	0.057 J
Total Carcinogenic PAHs		0.307	0.329	0.09	0.947
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.22 J	0.37 J	0.4 U	0.34 J
Acenaphthene	50	0.12 J	0.14 J	0.4 U	0.28 J
Acenaphthylene	41	0.033 J	0.066 J	0.4 U	0.12 J
Anthracene	50	0.095 J	0.12 J	0.056 J	0.39 J
Benzo(g,h,i)perylene	50	0.39 U	0.4 U	0.4 U	0.41 U
Fluoranthene	50	0.21 J	0.18 J	0.1 J	0.49
Fluorene	50	0.16 J	0.18 J	0.044 J	0.4 J
Naphthalene	13	0.35 J	0.22 J	0.4 U	0.13 J
Phenanthrene	50	0.66	0.66	0.27 J	1.6
Pyrene	50	0.3 J	0.31 J	0.14 J	0.8
Total Non-Carcinogenic PAHs		2.148	2.246	0.61	4.55
Total PAHs		2.455	2.575	0.7	5.497

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-24	RPSB-27	RPSB-28	RPSB-29
		30-32	40-42	38-40	35-37
		RPSB-24 (30-32)	RPSB-27 (40-42)	RPSB-28 (38-40)	RPSB-29 (35-37)
		01/11/2000	12/17/1999	12/30/1999	02/03/2000
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	13000 U	12000 U	14000 U	13000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	390 U	400 U	400 U	47 J
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA
Metals (mg/kg)					
Arsenic	7.5	0.96 B	1 B	0.85 B	0.42 U
Barium	300	5 B	1.8 B	2.7 B	1.6 B
Cadmium	1	0.19 U	0.22 U	0.18 U	0.065 B
Chromium	10	4.2	1.6 B	2	2 B
Lead	NE*	0.8 B	0.99 B	0.55 B	0.43 B*
Mercury	0.1	0.019 U	0.018 U	0.02 U	0.019 U
Selenium	2	0.39 U	0.43 U	0.36 U	0.42 U
Silver	NE*	0.29 U	0.32 U	0.27 U	0.21 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.049 B	0.043 U	0.047 U	0.081 U

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-31A	RPSB-34	RPSB-36	RPSB-37
		35-37	40-42	35-37	35-37
		RPSB-31A (35-37)	RPSB-34 (40-42)	RPSB-36 (35-37)	RPSB-37 (35-37)
		01/04/2000	12/29/1999	01/03/2000	01/12/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.006 U	0.015	0.001 U	0.002
Ethyl benzene	5.5	0.03	0.08	0.003	0.002
Toluene	1.5	0.006 U	0.001	0.001 U	0.002
Xylene (total)	1.2	0.05	0.1	0.002	0.005
Total BTEX		0.08	0.196	0.005	0.011
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**1.3**	**1.5**	**0.37 J**	0.42 U
Benzo(a)pyrene	0.061	**0.77 J**	**1.4**	**0.32 J**	0.42 U
Benzo(b)fluoranthene	1.1	0.61 J	**1.2**	0.27 J	0.42 U
Benzo(k)fluoranthene	1.1	0.22 J	0.66	0.13 J	0.42 U
Chrysene	0.4	**0.98**	**1.3**	0.32 J	0.42 U
Dibenzo(a,h)anthracene	0.014	0.83 U	**0.097 J**	0.4 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.26 J	0.25 J	0.068 J	0.42 U
Total Carcinogenic PAHs		4.14	6.407	1.478	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	5.9	3.4	0.65	0.42 U
Acenaphthene	50	2.2	4	0.65	0.42 U
Acenaphthylene	41	0.52 J	0.41 J	0.095 J	0.42 U
Anthracene	50	1.5	3.2	0.54	0.42 U
Benzo(g,h,i)perylene	50	0.37 J	0.3 J	0.078 J	0.42 U
Fluoranthene	50	2.2	3.1	0.84	0.42 U
Fluorene	50	2.4	2.3	0.5	0.42 U
Naphthalene	13	7.4	6.7	0.74	0.42 U
Phenanthrene	50	7.5	8.9 D	2.2	0.13 J
Pyrene	50	3.4	4.8	1.3	0.42 U
Total Non-Carcinogenic PAHs		33.39	37.11	7.593	0.13
Total PAHs		37.53	43.517	9.071	0.13

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-31A	RPSB-34	RPSB-36	RPSB-37
		35-37	40-42	35-37	35-37
		RPSB-31A (35-37)	RPSB-34 (40-42)	RPSB-36 (35-37)	RPSB-37 (35-37)
		01/04/2000	12/29/1999	01/03/2000	01/12/2000
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	12000 U	14000 U	14000 U	13000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	260 J	280 J	55 J	420 U
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA
Metals (mg/kg)					
Arsenic	7.5	0.84 B	0.84 B	0.9 B	0.37 U
Barium	300	3.7 B	1.9 B	5.3 B	1.9 B
Cadmium	1	0.21 U	0.24 U	0.18 U	0.24 U
Chromium	10	1.7 B	2.6	2.6	2.3 B
Lead	NE*	1.2	0.47 B	0.63 B	0.9 B
Mercury	0.1	0.018 U	0.021 U	0.02 U	0.021 U
Selenium	2	0.43 U	0.48 U	0.36 U	0.49 U
Silver	NE*	0.32 U	0.36 U	0.27 U	0.37 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.05 B	0.038 U	0.05 U	0.28 B

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-38	RPSB-42	RPSB-45	
		30-32	35-37	25-27	40-42
		RPSB-38 (30-32)	RPSB-42 (35-37)	RPSB-45 (25-27)	RPSB-45 (40-42)
		01/13/2000	01/24/2000	01/07/2000	01/07/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.002	0.002	0.012 U	0.001 U
Ethyl benzene	5.5	0.003	0.001 U	0.75	0.002
Toluene	1.5	0.002	0.004	0.012 U	0.001 U
Xylene (total)	1.2	0.006	0.003	0.68	0.004
Total BTEX		0.013	0.009	1.43	0.006
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.41 U	0.18 J	**3.1**	**0.47**
Benzo(a)pyrene	0.061	0.41 U	**0.14 J**	**2.3**	**0.37 J**
Benzo(b)fluoranthene	1.1	0.41 U	0.12 J	**1.6**	0.3 J
Benzo(k)fluoranthene	1.1	0.41 U	0.052 J	0.84	0.12 J
Chrysene	0.4	0.41 U	0.17 J	**2.4**	**0.41 J**
Dibenzo(a,h)anthracene	0.014	0.41 U	0.42 U	**0.23 J**	**0.047 J**
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.049 J	0.85	0.14 J
Total Carcinogenic PAHs		0	0.711	11.32	1.857
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.41 U	0.15 J	3.1	1
Acenaphthene	50	0.41 U	0.16 J	4.7	0.81
Acenaphthylene	41	0.41 U	0.18 J	0.72	0.34 J
Anthracene	50	0.41 U	0.25 J	4.2	0.7
Benzo(g,h,i)perylene	50	0.41 U	0.064 J	0.96	0.16 J
Fluoranthene	50	0.17 J	0.34 J	5.6	0.94
Fluorene	50	0.41 U	0.22 J	3.4	0.78
Naphthalene	13	0.41 U	0.17 J	5.1	0.91
Phenanthrene	50	0.16 J	1	1.1 D	2.8
Pyrene	50	0.28 J	0.57	7.7 D	1.3
Total Non-Carcinogenic PAHs		0.61	3.104	36.58	9.74
Total PAHs		0.61	3.815	47.9	11.597

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-38	RPSB-42	RPSB-45	
		30-32	35-37	25-27	40-42
		RPSB-38 (30-32)	RPSB-42 (35-37)	RPSB-45 (25-27)	RPSB-45 (40-42)
		01/13/2000	01/24/2000	01/07/2000	01/07/2000
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	12000 U	13000 U	12000 U	12000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	410 U	420 U	390	77 J
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA
Metals (mg/kg)					
Arsenic	7.5	1.2	0.74 B	0.25 U	0.7 B
Barium	300	2.1 B*	2.4 B	1.9 B	2.9 B
Cadmium	1	0.23 B	0.26 U	0.16 U	0.23 U
Chromium	10	2.1	2.3 B	1.8	2.1 B
Lead	NE*	1.6 *	0.98 B	0.62 B	0.83 B
Mercury	0.1	0.019 U	0.018 U	0.016 U	0.018 U
Selenium	2	0.3 U	0.98 B	0.33 U	1.2 B
Silver	NE*	0.23 U	0.38 U	0.25 U	0.34 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.17 B	0.24 B	0.042 U	0.049 U

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-46	RPSB-49	RPSB-50
		35-37	40-42	39-41
		RPSB-46 (35-37)	RPSB-49 (40-42)	RBSB-50 (39-41)
		12/20/1999	12/08/1999	12/10/1999
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	0.001 U	NA
Ethyl benzene	5.5	0.001 U	0.004	NA
Toluene	1.5	0.001 U	0.002	NA
Xylene (total)	1.2	0.001 J	0.01	NA
Total BTEX		0.001	0.016	NA
Other Volatile Organic Compounds (ug/kg)				
2-Butanone	300	NA	NA	NA
2-Hexanone	NE	NA	NA	NA
Acetone	200	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA
Methylene chloride	100	NA	NA	NA
Styrene	NE	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA
Trichloroethene	700	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.41 U	**0.32 J**	NA
Benzo(a)pyrene	0.061	0.41 U	**0.25 J**	NA
Benzo(b)fluoranthene	1.1	0.41 U	0.18 J	NA
Benzo(k)fluoranthene	1.1	0.41 U	0.11 J	NA
Chrysene	0.4	0.41 U	0.29 J	NA
Dibenzo(a,h)anthracene	0.014	0.41 U	0.42 U	NA
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.086 J	NA
Total Carcinogenic PAHs		0	1.236	NA
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.41 U	0.42 U	NA
Acenaphthene	50	0.41 U	0.57	NA
Acenaphthylene	41	0.41 U	0.11 J	NA
Anthracene	50	0.41 U	0.57	NA
Benzo(g,h,i)perylene	50	0.41 U	0.096 J	NA
Fluoranthene	50	0.062 J	0.67	NA
Fluorene	50	0.41 U	0.49	NA
Naphthalene	13	0.41 U	0.058 J	NA
Phenanthrene	50	0.15 J	1.9	NA
Pyrene	50	0.1 J	0.97	NA
Total Non-Carcinogenic PAHs		0.312	5.434	NA
Total PAHs		0.312	6.67	NA

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-46	RPSB-49	RPSB-50
		35-37	40-42	39-41
		RPSB-46 (35-37)	RPSB-49 (40-42)	RBSB-50 (39-41)
		12/20/1999	12/08/1999	12/10/1999
Other Semivolatile Organic Compounds (ug/kg)				
1,2-Dichlorobenzene	7900	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA
2-Methylphenol	100	NA	NA	NA
4-Methylphenol	900	NA	NA	NA
Benzene, hydroxy-	NE	15000 U	13000 U	11000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA
Carbazole	NE	NA	NA	NA
Dibenzofuran	6200	410 U	52 J	NA
Di-n-butylphthalate	8100	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA
Metals (mg/kg)				
Arsenic	7.5	1.2	0.66 B	NA
Barium	300	3.8 B	2.7 B	NA
Cadmium	1	0.22 U	0.19 U	NA
Chromium	10	2.4	5.4	NA
Lead	NE*	0.87 B	1	NA
Mercury	0.1	0.018 U	0.022 U	NA
Selenium	2	0.44 U	0.38 U	NA
Silver	NE*	0.47 B	0.29 U	NA
Total Cyanide (mg/kg)				
Cyanide, total	NE	0.82	0.29 B	NA

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-50	RPSB-51	RPSB-91
		39-41	40-42	28-30
		RBSB-50 (39-41)	RPSB-51 (40-42)	RPSB91 (28-30)
		12/10/1999	01/11/2000	11/01/2001
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.002	0.001 U	0.001 U
Ethyl benzene	5.5	0.002	0.002	0.001 U
Toluene	1.5	0.002	0.001 U	0.001 U
Xylene (total)	1.2	0.01	0.002	0.002
Total BTEX		0.016	0.004	0.002
Other Volatile Organic Compounds (ug/kg)				
2-Butanone	300	NA	NA	NA
2-Hexanone	NE	NA	NA	NA
Acetone	200	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA
Methylene chloride	100	NA	NA	NA
Styrene	NE	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA
Trichloroethene	700	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.41 U	**0.75**	0.4 U
Benzo(a)pyrene	0.061	0.41 U	**0.71**	0.4 U
Benzo(b)fluoranthene	1.1	0.41 U	0.54	0.4 U
Benzo(k)fluoranthene	1.1	0.41 U	0.26 J	0.4 U
Chrysene	0.4	0.41 U	**0.73**	0.4 U
Dibenzo(a,h)anthracene	0.014	0.41 U	**0.069 J**	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.3 J	0.4 U
Total Carcinogenic PAHs		0	3.359	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.41 U	0.46	0.4 U
Acenaphthene	50	0.41 U	0.48	0.053 J
Acenaphthylene	41	0.41 U	0.24 J	0.4 U
Anthracene	50	0.41 U	1	0.041 J
Benzo(g,h,i)perylene	50	0.41 U	0.37 J	0.4 U
Fluoranthene	50	0.41 U	1.7	0.051 J
Fluorene	50	0.41 U	0.77	0.4 U
Naphthalene	13	0.41 U	0.38 J	0.058 J
Phenanthrene	50	0.076 J	4	0.17 J
Pyrene	50	0.045 J	2.3	0.087 J
Total Non-Carcinogenic PAHs		0.121	11.7	0.46
Total PAHs		0.121	15.059	0.46

Table 4-3 (continued)
Soil Analytical Results
Former Gas Works Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-50	RPSB-51	RPSB-91
		39-41	40-42	28-30
		RBSB-50 (39-41)	RPSB-51 (40-42)	RPSB91 (28-30)
		12/10/1999	01/11/2000	11/01/2001
Other Semivolatile Organic Compounds (ug/kg)				
1,2-Dichlorobenzene	7900	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA
2-Methylphenol	100	NA	NA	NA
4-Methylphenol	900	NA	NA	NA
Benzene, hydroxy-	NE	NA	13000 U	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA
Carbazole	NE	NA	NA	NA
Dibenzofuran	6200	410 U	47 J	400 U
Di-n-butylphthalate	8100	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA
Metals (mg/kg)				
Arsenic	7.5	1 B	0.91 B	NA
Barium	300	8.9 B	1.3 B	NA
Cadmium	1	0.23 U	0.21 U	NA
Chromium	10	4.6	2.3	NA
Lead	NE*	0.63 B	0.61 B	NA
Mercury	0.1	0.02 U	0.019 U	NA
Selenium	2	0.47 U	0.68 B	NA
Silver	NE*	0.5 B	0.32 U	NA
Total Cyanide (mg/kg)				
Cyanide, total	NE	0.049 U	0.075 B	7 U

Notes:

* site background

NE - not established

NA - not analyzed

ND - indicates standard is applicable to analyte detection limit

J - estimated value

U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis

D - identifies all compounds in the analysis completed at secondary dilution factor

B - analyte was found within the laboratory method blank as well as the sample

N - spiked sample recovery was not within control limits (metals)

E - compound concentration exceeds the calibration range

P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.

Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.

TCLP - Toxicity Characteristic Leaching Procedure

mg/kg - milligrams/kilogram or parts per million (ppm)

ug/kg - micrograms/kilogram or parts per billion (ppb)

BTEX is benzene, toluene, ethylbenzene, and xylene.

PAHs are polycyclic aromatic hydrocarbons.

Table 4-4
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPMW-07D2	RPMW-08D2	RPSB-10	
		68-69	52-57	50-52	65-67
		RPMW-0702 (68-69)	RPMW-08D2 (52-57)	RPSB-10 (50-52)	RPSB-10 (65-67)
		08/14/2002	08/22/2002	12/28/1999	12/29/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.61 U	0.003	0.031	0.002
Ethyl benzene	5.5	**46**	0.002	0.013	0.001 U
Toluene	1.5	1.2	0.002	0.002	0.001 U
Xylene (total)	1.2	**57**	0.003	0.019	0.004
Total BTEX		104.2	0.01	0.065	0.006
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**110**	0.41 U	0.06 J	0.058 J
Benzo(a)pyrene	0.061	**81**	0.41 U	0.4 U	0.42 U
Benzo(b)fluoranthene	1.1	**65**	0.41 U	0.4 U	0.42 U
Benzo(k)fluoranthene	1.1	**25 J**	0.41 U	0.4 U	0.42 U
Chrysene	0.4	**130**	0.41 U	0.043 J	0.043 J
Dibenzo(a,h)anthracene	0.014	**8.6 J**	0.41 U	0.4 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	**28 J**	0.41 U	0.4 U	0.42 U
Total Carcinogenic PAHs		447.6	0	0.103	0.101
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	**450**	0.41 U	0.052 J	0.42 U
Acenaphthene	50	44 J	0.41 U	0.13 J	0.078 J
Acenaphthylene	41	**400**	0.41 U	0.029 J	0.42 U
Anthracene	50	**210**	0.41 U	0.11 J	0.062 J
Benzo(g,h,i)perylene	50	30 J	0.41 U	0.4 U	0.42 U
Fluoranthene	50	**220**	0.41 U	0.18 J	0.1 J
Fluorene	50	**310**	0.41 U	0.13 J	0.061 J
Naphthalene	13	**920**	0.41 U	0.27 J	0.42 U
Phenanthrene	50	**640**	0.07 J	0.59	0.3 J
Pyrene	50	**360**	0.41 U	0.25 J	0.16 J
Total Non-Carcinogenic PAHs		3584	0.07	1.741	0.761
Total PAHs		4031.6	0.07	1.844	0.862
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	**24000 J**	410 U	400 U	420 U
Metals (mg/kg)					
Arsenic	7.5	NA	NA	0.64 B	0.35 U
Barium	300	NA	NA	2.3 B	26
Cadmium	1	NA	NA	0.2 U	0.25 B
Chromium	10	NA	NA	1.9 B	7.6
Lead	NE*	NA	NA	0.32 B	3
Mercury	0.1	NA	NA	0.019 U	0.02 U
Selenium	2	NA	NA	0.4 U	**3.3**
Silver	NE*	NA	NA	0.3 U	0.35 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.29 U	0.27 U	0.032 U	0.033 UN

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-11	RPSB-118	RPSB-12
		45-47	57-67	50-52
		RPSB-11 (45-47)	RPSB-118 (57-67)	RPSB-12 (50-52)
		12/17/1999	08/16/2002	12/27/1999
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	**0.14 D**	0.001 U
Ethyl benzene	5.5	0.045	0.048	0.001 U
Toluene	1.5	0.001 U	0.013	0.001 U
Xylene (total)	1.2	0.024	0.059	0.001 U
Total BTEX		0.069	0.26	0
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.044 J	0.41 U	0.4 U
Benzo(a)pyrene	0.061	0.43 U	0.41 U	0.4 U
Benzo(b)fluoranthene	1.1	0.43 U	0.41 U	0.4 U
Benzo(k)fluoranthene	1.1	0.43 U	0.41 U	0.4 U
Chrysene	0.4	0.43 U	0.41 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.43 U	0.41 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.43 U	0.41 U	0.4 U
Total Carcinogenic PAHs		0.044	0	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.12 J	0.41 U	0.4 U
Acenaphthene	50	0.15 J	0.41 U	0.044 J
Acenaphthylene	41	0.031 J	0.41 U	0.4 U
Anthracene	50	0.085 J	0.41 U	0.041 J
Benzo(g,h,i)perylene	50	0.43 U	0.41 U	0.4 U
Fluoranthene	50	0.1 J	0.41 U	0.062 J
Fluorene	50	0.12 J	0.41 U	0.4 U
Naphthalene	13	0.29 J	0.41 U	0.046 J
Phenanthrene	50	0.4 J	0.085 J	0.18 J
Pyrene	50	0.17 J	0.041 J	0.1 J
Total Non-Carcinogenic PAHs		1.466	0.126	0.473
Total PAHs		1.51	0.126	0.473
Other Semivolatile Organic Compounds (ug/kg)				
Dibenzofuran	6200	430 U	410 U	400 U
Metals (mg/kg)				
Arsenic	7.5	0.92 B	NA	0.67 B
Barium	300	2.2 B	NA	1.6 B
Cadmium	1	0.23 U	NA	0.21 U
Chromium	10	2 B	NA	1.7 B
Lead	NE*	0.53 B	NA	0.51 B
Mercury	0.1	0.02 U	NA	0.021 U
Selenium	2	0.45 U	NA	0.41 U
Silver	NE*	0.34 U	NA	0.31 U
Total Cyanide (mg/kg)				
Cyanide, total	NE	0.11 B	0.30 U	0.034 U

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-120	RPSB-121	RPSB-122	RPSB-123
		63.5-67	67-71	74-77	80-86
		RPSB-120 (63.5-6)	RPSB-121 (67-71)	RPSB-122 (74-77)	RPSB-123 (80-86)
		08/16/2002	08/15/2002	08/19/2002	08/13/2002
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.012	0.017	0.001 U	0.063 U
Ethyl benzene	5.5	0.012	0.016	0.001 U	0.092
Toluene	1.5	0.002	0.001 U	0.001 U	0.063 U
Xylene (total)	1.2	0.015	0.058	0.001 U	**1.6**
Total BTEX		0.041	0.091	0	1.692
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.4 U	0.43 U	0.42 U	**18**
Benzo(a)pyrene	0.061	0.4 U	0.43 U	0.42 U	**14**
Benzo(b)fluoranthene	1.1	0.4 U	0.43 U	0.42 U	**11 J**
Benzo(k)fluoranthene	1.1	0.4 U	0.43 U	0.42 U	**5.7 J**
Chrysene	0.4	0.4 U	0.43 U	0.42 U	**20**
Dibenzo(a,h)anthracene	0.014	0.4 U	0.43 U	0.42 U	**1.3 J**
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	0.43 U	0.42 U	**5.3 J**
Total Carcinogenic PAHs		0	0	0	75.3
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.4 U	0.43 U	0.42 U	**89**
Acenaphthene	50	0.4 U	0.16 J	0.42 U	5.5 J
Acenaphthylene	41	0.4 U	0.43 U	0.42 U	**56**
Anthracene	50	0.4 U	0.1 J	0.42 U	32
Benzo(g,h,i)perylene	50	0.4 U	0.43 U	0.42 U	6.5 J
Fluoranthene	50	0.4 U	0.099 J	0.42 U	37
Fluorene	50	0.4 U	0.071 J	0.42 U	38
Naphthalene	13	0.4 U	0.14 J	0.42 U	**180**
Phenanthrene	50	0.4 U	0.5	0.42 U	**100**
Pyrene	50	0.4 U	0.13 J	0.42 U	**61**
Total Non-Carcinogenic PAHs		0	1.2	0	605
Total PAHs		0	1.2	0	680.3
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	400 U	430 U	420 U	4200 J
Metals (mg/kg)					
Arsenic	7.5	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.3 U	0.31 U	0.30 UJ	0.26 U

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-124	RPSB-16	RPSB-17	RPSB-18
		67-77	50-52	50-52	80-82
		RPSB-124 (67-77)	RPSB-16 (50-52)	RPSB-17 (50-52)	RPSB-18 (80-82)
		08/19/2002	12/07/1999	12/08/1999	12/09/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.005
Ethyl benzene	5.5	0.001 U	0.001 U	0.002	0.004
Toluene	1.5	0.001 U	0.001 U	0.002	0.002
Xylene (total)	1.2	0.001 U	0.001 U	0.009	0.012
Total BTEX		0	0	0.013	0.023
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.39 U	0.087 J	**0.33 J**	0.2 J
Benzo(a)pyrene	0.061	0.39 U	**0.065 J**	**0.24 J**	**0.15 J**
Benzo(b)fluoranthene	1.1	0.39 U	0.053 J	0.23 J	0.13 J
Benzo(k)fluoranthene	1.1	0.39 U	0.39 U	0.1 J	0.053 J
Chrysene	0.4	0.39 U	0.07 J	0.32 J	0.18 J
Dibenzo(a,h)anthracene	0.014	0.39 U	0.39 U	0.4 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.39 U	0.083 J	0.4 U
Total Carcinogenic PAHs		0	0.275	1.303	0.713
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.39 U	0.39 U	0.4 U	0.44
Acenaphthene	50	0.39 U	0.087 J	0.13 J	0.31 J
Acenaphthylene	41	0.39 U	0.39 U	0.16 J	0.14 J
Anthracene	50	0.39 U	0.1 J	0.33 J	0.27 J
Benzo(g,h,i)perylene	50	0.39 U	0.39 U	0.11 J	0.048 J
Fluoranthene	50	0.39 U	0.16 J	0.56	0.38 J
Fluorene	50	0.39 U	0.084 J	0.21 J	0.4 J
Naphthalene	13	0.39 U	0.39 U	0.4 U	0.21 J
Phenanthrene	50	0.39 U	0.49	1.4	1.4
Pyrene	50	0.39 U	0.26 J	1.1	0.76
Total Non-Carcinogenic PAHs		0	1.181	4	4.358
Total PAHs		0	1.456	5.303	5.071
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	390 U	390 U	400 U	400 U
Metals (mg/kg)					
Arsenic	7.5	NA	0.54 B	0.55 B	0.56 B
Barium	300	NA	2.9 B	17.9 B	20.4 B
Cadmium	1	NA	0.2 U	0.24 B	0.82
Chromium	10	NA	5.5	2.3	7.7
Lead	NE*	NA	1.1	9.2	3.6
Mercury	0.1	NA	0.019 U	0.02 U	0.046 B
Selenium	2	NA	0.4 U	0.43 U	0.46 U
Silver	NE*	NA	0.3 U	0.5 B	0.68 B
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.27 UJ	0.046 U	0.18 B	0.06 U

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-18	RPSB-22		RPSB-23
		85-87	60-62	80-82	48-50
		RPSB-18 (85-87)	RPSB-22 (60-62)	RPSB-22 (80-82)	RPSB-23 (48-50)
		12/09/1999	12/02/1999	12/02/1999	01/06/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.025	**9**	0.016	0.001 U
Ethyl benzene	5.5	0.019	**18**	0.005	0.008
Toluene	1.5	0.002	**11**	0.016	0.001 U
Xylene (total)	1.2	0.013	**49**	0.032	0.017
Total BTEX		0.059	87	0.069	0.025
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.41 U	**200 DJ**	0.1 J	0.14 J
Benzo(a)pyrene	0.061	0.41 U	**170 DJ**	**0.075 J**	**0.1 J**
Benzo(b)fluoranthene	1.1	0.41 U	**120 DJ**	0.053 J	0.079 J
Benzo(k)fluoranthene	1.1	0.41 U	**65 D**	0.44 U	0.04 J
Chrysene	0.4	0.41 U	**180 DJ**	0.087 J	0.13 J
Dibenzo(a,h)anthracene	0.014	0.41 U	**19**	0.44 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	**61 DJ**	0.44 U	0.042 J
Total Carcinogenic PAHs		0	815	0.315	0.531
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.41 U	**1100 D**	0.2 J	0.16 J
Acenaphthene	50	0.41 U	**66 DJ**	0.017 J	0.15 J
Acenaphthylene	41	0.41 U	**650 D**	0.2 J	0.1 J
Anthracene	50	0.41 U	**320 DJ**	0.13 J	0.16 J
Benzo(g,h,i)perylene	50	0.41 U	**75 DJ**	0.44 U	0.044 J
Fluoranthene	50	0.41 U	**470 D**	0.2 J	0.32 J
Fluorene	50	0.41 U	**390 DJ**	0.16 J	0.26 J
Naphthalene	13	0.41 U	**3400 D**	0.53	0.07 J
Phenanthrene	50	0.054 J	**1200 D**	0.56	1.1
Pyrene	50	0.41 U	**510 D**	0.25 J	0.45
Total Non-Carcinogenic PAHs		0.054	8181	2.247	2.814
Total PAHs		0.054	8996	2.562	3.345
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	410 U	**42000 DJ**	440 U	410 U
Metals (mg/kg)					
Arsenic	7.5	0.64 B	0.55 B	0.52 B	0.64 B
Barium	300	47.6	7.5 B	30.5	2.9 B
Cadmium	1	**1.4**	0.38 B	0.94	0.22 U
Chromium	10	**15.7**	4.8	9.3	2.3
Lead	NE*	5.5	1.3	3.5	0.74 B
Mercury	0.1	0.026 B	0.02 U	0.019 U	0.02 U
Selenium	2	0.49 U	1 B	**2.9**	0.7 B
Silver	NE*	0.9 B	0.35 B	0.67 B	0.34 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.044 U	0.047 B	0.081 B	0.058 U

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-24	RPSB-28	RPSB-29	RPSB-30
		50-52	48-50	55-57	60-62
		RPSB-24 (50-52)	RPSB-28 (48-50)	RPSB-29 (55-57)	RPSB-30 (60-62)
		01/11/2000	12/30/1999	02/02/2000	02/02/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 J	0.012	0.28 U	0.002
Ethyl benzene	5.5	0.003	0.002	4.7	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.44	0.001 U
Xylene (total)	1.2	0.005	0.001 U	**15**	0.001 U
Total BTEX		0.009	0.014	20.14	0.002
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.075 J	0.078 J	**64 J**	0.39 U
Benzo(a)pyrene	0.061	0.06 J	0.053 J	**49 J**	0.39 U
Benzo(b)fluoranthene	1.1	0.051 J	0.41 U	**37 J**	0.39 U
Benzo(k)fluoranthene	1.1	0.33 U	0.41 U	**10 J**	0.39 U
Chrysene	0.4	0.074 J	0.075 J	**58 J**	0.39 U
Dibenzo(a,h)anthracene	0.014	0.33 U	0.41 U	75 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.33 U	0.41 U	**17 J**	0.39 U
Total Carcinogenic PAHs		0.26	0.206	235	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.095 J	0.41 U	**510**	0.39 U
Acenaphthene	50	0.082 J	0.091 J	**190**	0.39 U
Acenaphthylene	41	0.33 U	0.41 U	**51 J**	0.39 U
Anthracene	50	0.082 J	0.11 J	**110**	0.39 U
Benzo(g,h,i)perylene	50	0.33 U	0.41 U	18 J	0.39 U
Fluoranthene	50	0.16 J	0.16 J	**120**	0.39 U
Fluorene	50	0.1 J	0.087 J	**150**	0.39 U
Naphthalene	13	0.065 J	0.41 U	**1200**	0.39 U
Phenanthrene	50	0.47	0.44	**430**	0.39 U
Pyrene	50	0.22 J	0.23 J	**200**	0.39 U
Total Non-Carcinogenic PAHs		1.274	1.118	2979	0
Total PAHs		1.534	1.324	3214	0
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	330 U	410 U	**15000 J**	390 U
Metals (mg/kg)					
Arsenic	7.5	0.76 B	0.72 B	1.1 B	0.72 B
Barium	300	1.7 B	2.7 B	2.4 B	1.8 B
Cadmium	1	0.24 U	0.22 U	0.13 B	0.093 B
Chromium	10	3.2	1.6 B	2.2	2.1
Lead	NE*	0.74 B	0.52 B	0.19 U	0.23 U
Mercury	0.1	0.019 U	0.02 U	0.017 U	0.019 U
Selenium	2	0.5 B	0.58 B	0.33 U	0.4 U
Silver	NE*	0.36 U	0.33 U	0.26 B	0.31 B
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.1 B	0.052 U	0.066 U	0.083 U

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-31B	RPSB-34	RPSB-35	
		48-50	80-82	60-62	80-82
		RPSB-31B(48-50)	RPSB-34 (80-82)	RPSB-35 (60-62)	RPSB-35 (80-82)
		01/13/2000	12/30/1999	01/03/2000	01/04/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.002	0.001	0.006	0.022
Ethyl benzene	5.5	0.003	0.001	0.2	0.006
Toluene	1.5	0.002	0.001 U	0.11	0.013
Xylene (total)	1.2	0.006	0.001 U	0.3	0.11
Total BTEX		0.013	0.002	0.616	0.151
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.19 J	0.17 J	**7**	0.075 J
Benzo(a)pyrene	0.061	**0.092 J**	**0.14 J**	**6.9**	0.043 J
Benzo(b)fluoranthene	1.1	0.12 J	0.12 J	**4.8**	0.42 U
Benzo(k)fluoranthene	1.1	0.042 J	0.059 J	**2.9 J**	0.42 U
Chrysene	0.4	0.19 J	0.16 J	**6.4**	0.07 J
Dibenzo(a,h)anthracene	0.014	0.41 U	0.4 U	3.8 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.044 J	0.4 U	1.5 J	0.42 U
Total Carcinogenic PAHs		0.678	0.649	29.5	0.188
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.056 J	0.13 J	**37**	0.14 J
Acenaphthene	50	0.15 J	0.11 J	2.8 J	0.42 U
Acenaphthylene	41	0.064 J	0.14 J	14	0.14 J
Anthracene	50	0.17 J	0.24 J	13	0.16 J
Benzo(g,h,i)perylene	50	0.044 J	0.4 U	1.8 J	0.42 U
Fluoranthene	50	0.54	0.4	14	0.21 J
Fluorene	50	0.2 J	0.19 J	13	0.12 J
Naphthalene	13	0.41 U	0.2 J	**92 D**	0.42 J
Phenanthrene	50	0.83	1	44	0.44
Pyrene	50	0.48	0.55	24	0.4 J
Total Non-Carcinogenic PAHs		2.534	2.96	255.6	2.03
Total PAHs		3.212	3.609	285.1	2.218
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	130 J	400 U	1400 J	420 U
Metals (mg/kg)					
Arsenic	7.5	0.4 B	1.8 B	0.63 B	1.4
Barium	300	1.7 B	61.1 E	2.4 B	14.4 B
Cadmium	1	0.18 U	0.35 B	0.2 U	0.62
Chromium	10	3.4	**18.2**	4.2	7.8
Lead	NE*	0.91	1.8	0.3 U	1.9
Mercury	0.1	0.02 U	0.02 U	0.016 U	0.02 U
Selenium	2	0.35 U	0.55 B	0.4 U	0.51 B
Silver	NE*	0.27 U	2 B	0.3 U	1.6 B
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.21 B	0.045 U	0.055 U	0.061 U

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-36	RPSB-37	RPSB-38	RPSB-41
		55-57	50-52	50-52	45-47
		RPSB-36 (55-57)	RPSB-37 (50-52)	RPSB-38 (50-52)	RPSB-41 (45-47)
		01/04/2000	01/12/2000	01/13/2000	12/16/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001	0.002	0.001 U	0.001 U
Ethyl benzene	5.5	0.002	0.004	0.002	0.001 U
Toluene	1.5	0.001 U	0.003	0.002	0.001 U
Xylene (total)	1.2	0.001 U	0.009	0.006	0.002
Total BTEX		0.003	0.018	0.01	0.002
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.093 J	0.39 U	0.41 U	0.39 U
Benzo(a)pyrene	0.061	0.043 J	0.39 U	0.41 U	0.39 U
Benzo(b)fluoranthene	1.1	0.4 U	0.39 U	0.41 U	0.39 U
Benzo(k)fluoranthene	1.1	0.4 U	0.39 U	0.41 U	0.39 U
Chrysene	0.4	0.057 J	0.39 U	0.41 U	0.39 U
Dibenzo(a,h)anthracene	0.014	0.4 U	0.39 U	0.41 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	0.39 U	0.41 U	0.39 U
Total Carcinogenic PAHs		0.193	0	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.4 U	0.39 U	0.41 U	0.064 J
Acenaphthene	50	0.4 U	0.39 U	0.41 U	0.39 U
Acenaphthylene	41	0.4 U	0.39 U	0.41 U	0.059 J
Anthracene	50	0.088 J	0.39 U	0.41 U	0.063 J
Benzo(g,h,i)perylene	50	0.4 U	0.39 U	0.41 U	0.39 U
Fluoranthene	50	0.18 J	0.39 U	0.41 U	0.059 J
Fluorene	50	0.043 J	0.39 U	0.41 U	0.068 J
Naphthalene	13	0.047 J	0.39 U	0.41 U	0.043 J
Phenanthrene	50	0.38 J	0.39 U	0.054 J	0.26 J
Pyrene	50	0.27 J	0.39 U	0.41 U	0.15 J
Total Non-Carcinogenic PAHs		1.008	0	0.054	0.766
Total PAHs		1.201	0	0.054	0.766
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	400 U	390 U	410 U	390 U
Metals (mg/kg)					
Arsenic	7.5	0.89 B	0.32 B	0.61 B	1.8
Barium	300	1.7 B	1.5 B	2.1 B*	39.3
Cadmium	1	0.24 U	0.21 U	0.21 U	0.29 U
Chromium	10	2.5	2.4	2 B	1.7 B
Lead	NE*	0.97 B	0.87 B	1.5 *	4.8
Mercury	0.1	0.021 U	0.019 U	0.018 U	0.025 U
Selenium	2	0.47 U	0.42 U	0.43 U	0.59 U
Silver	NE*	0.35 U	0.31 U	0.32 U	0.44 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.053 U	0.27 B	0.18 B	0.62 B

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-43	RPSB-44	RPSB-45	RPSB-46
		45-47	65-67	50-52	50-52
		RPSB-43 (45-47)	RPSB-44 (65-67)	RPSB-45 (50-52)	RPSB-46 (50-52)
		12/02/1999	12/06/1999	01/07/2000	12/20/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.062 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.12	0.001 J	0.001 U	0.001 J
Toluene	1.5	0.062 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.22	0.003	0.001 U	0.005
Total BTEX		0.34	0.004	0	0.006
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**4.2**	**0.36 J**	0.41 U	0.42 U
Benzo(a)pyrene	0.061	**2.8**	**0.29 J**	0.41 U	0.42 U
Benzo(b)fluoranthene	1.1	**2.3**	0.24 J	0.41 U	0.42 U
Benzo(k)fluoranthene	1.1	0.89	0.068 J	0.41 U	0.42 U
Chrysene	0.4	**4.4**	0.33 J	0.41 U	0.42 U
Dibenzo(a,h)anthracene	0.014	**0.21 J**	0.39 U	0.41 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.79	0.1 J	0.41 U	0.42 U
Total Carcinogenic PAHs		15.59	1.388	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	26 D	0.24 J	0.41 U	0.42 U
Acenaphthene	50	6	0.62	0.41 U	0.42 U
Acenaphthylene	41	6.3	0.43	0.41 U	0.42 U
Anthracene	50	6.5	0.52	0.045 J	0.42 U
Benzo(g,h,i)perylene	50	0.83	0.12 J	0.41 U	0.42 U
Fluoranthene	50	10 D	0.68	0.075 J	0.42 U
Fluorene	50	11 D	0.56	0.41 U	0.42 U
Naphthalene	13	**49 D**	0.44	0.41 U	0.42 U
Phenanthrene	50	30 D	2.2	0.22 J	0.06 J
Pyrene	50	12 D	1.1	0.11 J	0.42 U
Total Non-Carcinogenic PAHs		157.63	6.91	0.45	0.06
Total PAHs		173.22	8.298	0.45	0.06
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	1100	60 J	410 U	420 U
Metals (mg/kg)					
Arsenic	7.5	0.83 B	0.57 B	0.64 B	0.46 B
Barium	300	2.4 B	2.7 B	1.3 B	2 B
Cadmium	1	0.46 B	0.18 B	0.22 U	0.18 U
Chromium	10	4.5	3	2.2 B	2.6
Lead	NE*	1	1	0.68 B	0.63 B
Mercury	0.1	0.019 U	0.018 U	0.02 U	0.017 U
Selenium	2	0.39 U	0.35 U	0.44 U	0.37 U
Silver	NE*	0.29 U	0.27 U	0.33 U	0.3 B
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.091 B	0.055 U	0.051 U	1.1

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-49	RPSB-50	RPSB-51
		50-52	55-57	50-52
		RPSB-49 (50-52)	RPSB-50 (55-57)	RPSB-51 (50-52)
		12/08/1999	12/13/1999	01/11/2000
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.002	0.001 U	0.001 J
Ethyl benzene	5.5	0.003	0.002	0.004
Toluene	1.5	0.004	0.003	0.001 U
Xylene (total)	1.2	0.012	0.006	0.007
Total BTEX		0.021	0.011	0.012
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	**0.31 J**	0.044 J	0.094 J
Benzo(a)pyrene	0.061	**0.24 J**	0.41 U	**0.074 J**
Benzo(b)fluoranthene	1.1	0.19 J	0.41 U	0.06 J
Benzo(k)fluoranthene	1.1	0.061 J	0.41 U	0.029 J
Chrysene	0.4	0.26 J	0.044 J	0.082 J
Dibenzo(a,h)anthracene	0.014	0.4 U	0.41 U	0.43 U
Indeno(1,2,3-cd)pyrene	3.2	0.07 J	0.41 U	0.43 U
Total Carcinogenic PAHs		1.131	0.088	0.339
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.14 J	0.41 U	0.071 J
Acenaphthene	50	0.44	0.045 J	0.076 J
Acenaphthylene	41	0.12 J	0.41 U	0.43 U
Anthracene	50	0.48	0.05 J	0.11 J
Benzo(g,h,i)perylene	50	0.089 J	0.41 U	0.43 U
Fluoranthene	50	0.55	0.09 J	0.22 J
Fluorene	50	0.43	0.045 J	0.11 J
Naphthalene	13	0.09 J	0.41 U	0.067 J
Phenanthrene	50	1.6	0.26 J	0.62
Pyrene	50	1	0.13 J	0.31 J
Total Non-Carcinogenic PAHs		4.936	0.62	1.584
Total PAHs		6.067	0.708	1.923
Other Semivolatile Organic Compounds (ug/kg)				
Dibenzofuran	6200	400 U	410 U	430 U
Metals (mg/kg)				
Arsenic	7.5	0.34 U	0.91	0.96 B
Barium	300	3.7 B	2.8 B	2.7 B
Cadmium	1	0.23 U	0.17 U	0.2 U
Chromium	10	3.4	3.6	2.4
Lead	NE*	1.8	0.73 B	0.94 B
Mercury	0.1	0.018 U	0.019 U	0.018 U
Selenium	2	0.45 U	0.34 U	0.39 U
Silver	NE*	0.34 U	0.26 U	0.29 U
Total Cyanide (mg/kg)				
Cyanide, total	NE	0.064 B	0.041 U	0.046 U

Table 4-4 (continued)
Soil Analytical Results
Former Gas Works Area (45-90 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-5
Soil Analytical Results
Former Gas Works Area (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPMW-07D2	RPMW-08D2	RPSB-119	RPSB-121	RPSB-123
		97-107	97-107	87-97	117-127	100-104.5
		RPMW-0702 (97-107	RPMW-08D2 (97-107	RPSB119 (87-97)	RPSB-121 (117-127)	RPSB-123 (100-104.5
		08/14/2002	08/22/2002	8/23/2002	08/15/2002	08/13/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.005 J	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 J
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.006
Total BTEX		0	0.005	0	0	0.007
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**0.24 J**	0.41 U	0.047 J	0.4 U	0.42 U
Benzo(a)pyrene	0.061	**0.16 J**	0.41 U	0.41 U	0.4 U	0.42 U
Benzo(b)fluoranthene	1.1	0.12 J	0.41 U	0.41 U	0.4 U	0.42 U
Benzo(k)fluoranthene	1.1	0.052 J	0.41 U	0.41 U	0.4 U	0.42 U
Chrysene	0.4	0.24 J	0.41 U	0.049 J	0.4 U	0.42 U
Dibenzo(a,h)anthracene	0.014	0.39 U	0.41 U	0.41 U	0.4 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.41 U	0.41 U	0.4 U	0.42 U
Total Carcinogenic PAHs		0.812	0	0.096	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.21 J	0.41 U	0.41 U	0.4 U	0.42 U
Acenaphthene	50	0.16 J	0.41 U	0.41 U	0.4 U	0.42 U
Acenaphthylene	41	0.39 J	0.41 U	0.058 J	0.4 U	0.42 U
Anthracene	50	0.42	0.41 U	0.097 J	0.4 U	0.42 U
Benzo(g,h,i)perylene	50	0.045 J	0.41 U	0.41 U	0.4 U	0.42 U
Fluoranthene	50	0.45	0.41 U	0.1 J	0.4 U	0.42 U
Fluorene	50	0.43	0.41 U	0.078 J	0.4 U	0.42 U
Naphthalene	13	0.41	0.41 U	0.41 U	0.4 U	0.16 J
Phenanthrene	50	1.5	0.41 U	0.28 J	0.4 U	0.055 J
Pyrene	50	0.81	0.41 U	0.14 J	0.4 U	0.042 J
Total Non-Carcinogenic PAHs		4.825	0	0.753	0	0.257
Total PAHs		5.637	0	0.849	0	0.257
Other Semivolatile Organic Compounds (ug/kg)						
Dibenzofuran	6200	390 U	410 U	410 U	400 U	420 U
Metals (mg/kg)						
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.26 U	0.29 U	0.30 U	0.26 U	0.43 B

Table 4-5 (continued)
Soil Analytical Results
Former Gas Works Area (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-123		RPSB-29	RPSB-31A	RPSB-42
		116-121	141-146	134-136	133-135	124-126
		RPSB-123 (116-121)	RPSB-123 (141-146)	RPSB-29 (134-136)	SB-31A (133-135)	RPSB-42 (124-126)
		08/13/2002	08/13/2002	02/25/2000	03/10/2000	02/29/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	**130**	0.007	0.003	0.003	0.001 U
Ethyl benzene	5.5	**96**	0.002	0.002	0.002	0.001 U
Toluene	1.5	**49**	0.005	0.001	0.001 U	0.003
Xylene (total)	1.2	**500**	0.01	0.014	0.014	0.013
Total BTEX		775	0.024	0.02	0.019	0.016
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**250 J**	0.38 U	0.086 J	0.15 J	0.1 J
Benzo(a)pyrene	0.061	**180 J**	0.38 U	0.39 U	**0.12 J**	**0.072 J**
Benzo(b)fluoranthene	1.1	**130 J**	0.38 U	0.39 U	0.088 J	0.056 J
Benzo(k)fluoranthene	1.1	**56 J**	0.38 U	0.39 U	0.39 U	0.39 U
Chrysene	0.4	**270 J**	0.38 U	0.075 J	0.15 J	0.088 J
Dibenzo(a,h)anthracene	0.014	290 U	0.38 U	0.39 U	0.39 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	**68 J**	0.38 U	0.39 U	0.39 U	0.39 U
Total Carcinogenic PAHs		954	0	0.161	0.508	0.316
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	**1600**	0.38 U	0.28 J	0.63	0.077 J
Acenaphthene	50	**91 J**	0.38 U	0.39 U	0.1 J	0.39 U
Acenaphthylene	41	**720**	0.38 U	0.16 J	0.27 J	0.1 J
Anthracene	50	**440**	0.38 U	0.12 J	0.23 J	0.14 J
Benzo(g,h,i)perylene	50	**85 J**	0.38 U	0.39 U	0.39 U	0.39 U
Fluoranthene	50	**490**	0.38 U	0.16 J	0.28 J	0.22 J
Fluorene	50	**540**	0.38 U	0.13 J	0.29 J	0.1 J
Naphthalene	13	**3800**	0.38 U	0.47	0.98	0.15 J
Phenanthrene	50	**1500**	0.38 U	0.5	0.96	0.52
Pyrene	50	**810**	0.38 U	0.27 J	0.47	0.27 J
Total Non-Carcinogenic PAHs		10076	0	2.09	4.21	1.577
Total PAHs		11030	0	2.251	4.718	1.893
Other Semivolatile Organic Compounds (ug/kg)						
Dibenzofuran	6200	**59000 J**	380 U	390 U	390 U	390 U
Metals (mg/kg)						
Arsenic	7.5	NA	NA	NA	1.4	4
Barium	300	NA	NA	NA	6.5 B	52.9
Cadmium	1	NA	NA	NA	0.11 B	0.045 U
Chromium	10	NA	NA	NA	2.7	**12.7**
Lead	NE*	NA	NA	NA	2.2	8.8
Mercury	0.1	NA	NA	NA	0.016 U	0.019 U
Selenium	2	NA	NA	NA	0.31 U	0.45 U
Silver	NE*	NA	NA	NA	0.27 B	0.23 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.24 U	0.29 U	0.13 B	0.22 U	0.11 U

Table 4-5 (continued)
Soil Analytical Results
Former Gas Works Area (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-43	RPSB-44	RPSB-92A	
		95-97	149-151	98-100	98-100
		RPSB-43 (95-97)	RPSB-44 (149-151)	PSB-92A (98-100)	RPSB-92A (98-100)
		12/03/1999	03/15/2000	11/08/2001	11/08/2001
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.001	**0.43**	NA
Ethyl benzene	5.5	0.001 U	0.002	**8**	NA
Toluene	1.5	0.001	0.001	**1.6**	NA
Xylene (total)	1.2	0.003	0.014	**17**	NA
Total BTEX		0.004	0.018	27.03	0
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.05 J	0.061 J	NA	**20**
Benzo(a)pyrene	0.061	0.41 U	0.048 J	NA	**19**
Benzo(b)fluoranthene	1.1	0.41 U	0.41 U	NA	**14**
Benzo(k)fluoranthene	1.1	0.41 U	0.41 U	NA	**6.4**
Chrysene	0.4	0.044 J	0.061 J	NA	**19**
Dibenzo(a,h)anthracene	0.014	0.41 U	0.41 U	NA	**2 J**
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.41 U	NA	**5.4**
Total Carcinogenic PAHs		0.094	0.17	NA	85.8
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.061 J	0.13 J	NA	**210 D**
Acenaphthene	50	0.41 U	0.41 U	NA	8.4
Acenaphthylene	41	0.071 J	0.1 J	NA	**130 D**
Anthracene	50	0.075 J	0.086 J	NA	38
Benzo(g,h,i)perylene	50	0.41 U	0.41 U	NA	5.3
Fluoranthene	50	0.12 J	0.12 J	NA	35
Fluorene	50	0.068 J	0.096 J	NA	**56**
Naphthalene	13	0.14 J	0.28 J	NA	**400 D**
Phenanthrene	50	0.3 J	0.35 J	NA	**200 D**
Pyrene	50	0.15 J	0.18 J	NA	**51**
Total Non-Carcinogenic PAHs		0.985	1.342	NA	1133.7
Total PAHs		1.079	1.512	NA	1219.5
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	410 U	410 U	NA	5500
Metals (mg/kg)					
Arsenic	7.5	1.3	0.91	NA	NA
Barium	300	30.3 E	10.1 B	NA	NA
Cadmium	1	**1.6**	0.12 B	NA	NA
Chromium	10	**11.7**	2.2	NA	NA
Lead	NE*	5.1	1.7	NA	NA
Mercury	0.1	0.02 U	0.021 U	NA	NA
Selenium	2	**5.9**	0.32 U	NA	NA
Silver	NE*	1.2 B	0.32 B	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.071 B	0.15 U	NA	7 U

Table 4-5 (continued)
Soil Analytical Results
Former Gas Works Area (>90 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-6
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		GP-01		GP-03	GP-04	GP-05	GP-06
		1.50 GP-01 10/16/1998	10.00 RB-GP01 10/16/1998	1.50 GP-03 10/19/1998	1.50 GP-04 10/16/1998	1.50 GP-05 10/21/1998	0.75 GP-06 10/21/1998
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.0010 U	NA	0.0010 U	0.0079	0.0026	0.0011 U
Ethyl benzene	5.5	0.0010 U	NA	0.0010 U	0.0008 J	0.0011 U	0.0011 U
Toluene	1.5	0.0010 U	NA	0.0010 U	0.011	0.0025	0.0011 U
Xylene (total)	1.2	0.0010 U	NA	0.0010 U	0.0038	0.0009 J	0.0007 J
Total BTEX		0	NA	0	0.0235	0.006	0.0007
Other Volatile Organic Compounds (ug/kg)							
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**1.5**	NA	**0.63**	**57**	**23**	**0.23 J**
Benzo(a)pyrene	0.061	**1.1**	NA	**0.46**	**18 J**	**14**	**0.27 J**
Benzo(b)fluoranthene	1.1	**2.4**	NA	0.94	**84**	**34**	0.47
Benzo(k)fluoranthene	1.1	**2.1**	NA	0.14 J	**23**	**7.5**	0.16 J
Chrysene	0.4	**1.8**	NA	**0.85**	**70**	**23**	0.29 J
Dibenzo(a,h)anthracene	0.014	**0.16 J**	NA	**0.052 J**	18.2 U	**2.1 J**	0.37 U
Indeno(1,2,3-cd)pyrene	3.2	0.54	NA	0.17 J	**8.3 J**	**7.5**	0.23 J
Total Carcinogenic PAHs		9.6	NA	3.242	260.3	111.1	1.65
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.29 J	NA	1.1	5.7 J	2.6 J	0.047 J
Acenaphthene	50	0.35 U	NA	0.35	18.2 U	0.42 J	0.374 U
Acenaphthylene	41	0.52	NA	0.17 J	16 J	5.9	0.038 J
Anthracene	50	0.17 J	NA	0.23 J	7.2 J	3.2 J	0.37 U
Benzo(g,h,i)perylene	50	0.46	NA	0.15 J	5.7 J	7.2	0.2 J
Fluoranthene	50	2.2	NA	0.8	**78 D**	31 D	0.28 J
Fluorene	50	0.042 J	NA	0.25 J	7.1 J	2.6 J	0.374 U
Naphthalene	13	0.35 J	NA	1.7 E	4.7 J	2.3 J	0.069 J
Phenanthrene	50	0.91	NA	1.1	**140**	28 D	0.19 J
Pyrene	50	5.6 DJ	NA	1.6 E	**220 D**	38 D	0.39
Total Non-Carcinogenic PAHs		10.542	NA	7.45	484.4	121.22	1.214
Total PAHs		20.142	NA	10.692	744.7	232.32	2.864
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		GP-01		GP-03	GP-04	GP-05	GP-06
		1.50 GP-01 10/16/1998	10.00 RB-GP01 10/16/1998	1.50 GP-03 10/19/1998	1.50 GP-04 10/16/1998	1.50 GP-05 10/21/1998	0.75 GP-06 10/21/1998
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	6.7	NA	3.9	**16.3**	**10.4**	2.3
Barium	300	37.6 B	NA	19.8 B	63.6	77.4	124
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.9 B	NA	0.7 B	0.8 B	0.4 B	0.9 B
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	8.8	NA	2.9	**12.6**	7.4	**12.5**
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	118	NA	105	468	89.6	112
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.1 U	NA	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.7 U	NA	0.7 U	1.9	0.9 B	0.8 B
Silver	NE*	0.4 B	NA	0.3 U	0.7 B	0.3 U	0.3 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	35.8	3.5	2.3	207	44.2	1.1 U
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	36 U	NA	34 U
Aroclor 1254	1000/10000	NA	NA	NA	36 U	NA	34 U
Aroclor 1260	1000/10000	NA	NA	NA	36 U	NA	100 J
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	73 U	NA	3.4 U
4,4'-DDE	2100	NA	NA	NA	73 U	NA	3.4 U
4,4'-DDT	2100	NA	NA	NA	73 U	NA	3.4 U
Aldrin	41	NA	NA	NA	36 U	NA	1.7 U
alpha-BHC	110	NA	NA	NA	36 U	NA	1.7 U
alpha-Chlordane	NE	NA	NA	NA	36 U	NA	1.7 U
beta-BHC	200	NA	NA	NA	36 U	NA	1.7 U
delta-BHC	300	NA	NA	NA	36 U	NA	1.7 U
Dieldrin	44	NA	NA	NA	73 U	NA	3.4 U
Endosulfan I	900	NA	NA	NA	36 U	NA	1.7 U
Endosulfan II	900	NA	NA	NA	73 U	NA	3.4 U
Endosulfan sulfate	1000	NA	NA	NA	73 U	NA	3.4 U
Endrin	100	NA	NA	NA	73 U	NA	3.4 U
Endrin aldehyde	NE	NA	NA	NA	73 U	NA	3.4 U
Endrin ketone	NE	NA	NA	NA	73 U	NA	3.4 U
gamma-Chlordane	540	NA	NA	NA	36 U	NA	1.7 U
Heptachlor	100	NA	NA	NA	36 U	NA	1.7 U
Heptachlor epoxide	20	NA	NA	NA	36 U	NA	1.7 U
Lindane	NE	NA	NA	NA	36 U	NA	1.7 U
Methoxychlor	NE	NA	NA	NA	36 U	NA	17 U
Toxaphene	NE	NA	NA	NA	360 U	NA	170 U
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	870	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	120 U	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	120 U	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	198 U	NA	NA	NA	NA
Barium (TCLP)	NE	NA	343	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	4.6 B	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	22.0	NA	NA	NA	NA
Lead (TCLP)	NE	NA	186 U	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	3.3 U	NA	NA	NA	NA
Silver (TCLP)	NE	NA	1.3 U	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		GP-07	GP-08	GP-09	GP-10	GP-11	GP-12
		1.50	8-10	8-11	1.50	1.50	1.50
		GP-07	RP-GP08 (8-10)	RB-GP09 (8-11)	GP-10	GP-11	GP-12
		10/16/1998	10/19/1998	10/19/1998	10/19/1998	10/19/1998	10/20/1998
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.0010 U	**3.5**	**4.7**	0.0010 U	0.0010 U	0.0010 U
Ethyl benzene	5.5	0.0010 U	**130**	**77**	0.0010 U	0.0010 U	0.0007 J
Toluene	1.5	0.0010 U	**2.1 J**	3.1 U	0.0010 U	0.0010 U	0.0007 J
Xylene (total)	1.2	0.0010 U	**33**	**4.4**	0.0010 U	0.0005 J	0.0007 J
Total BTEX		0	168.6	86.1	0	0.0005	0.0021
Other Volatile Organic Compounds (ug/kg)							
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	0.13 J	**26**	**21**	**11 D**	**0.6**	**2.6**
Benzo(a)pyrene	0.061	**0.075 J**	**18**	**14**	**6.5 DJ**	**0.33 J**	**2.1**
Benzo(b)fluoranthene	1.1	0.12 J	**18**	**14**	**6.8 DJ**	0.65	**2.5 D**
Benzo(k)fluoranthene	1.1	0.041 J	**5.9**	**5**	**2.9 DJ**	0.11 J	**1.6**
Chrysene	0.4	0.14 J	**22**	**20**	**13 D**	**0.7**	**3 D**
Dibenzo(a,h)anthracene	0.014	0.34 U	**1.1 J**	**0.88 J**	**1.3**	**0.052 J**	**0.25 J**
Indeno(1,2,3-cd)pyrene	3.2	0.34 U	**3.7 J**	3 J	1.8 DJ	0.17 J	0.94
Total Carcinogenic PAHs		0.506	94.7	77.88	43.3	2.612	12.99
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.34 U	**280**	**92 D**	0.27 J	0.25 J	0.27 J
Acenaphthene	50	0.34 U	**83**	**89 D**	0.27 J	0.096 J	0.075 J
Acenaphthylene	41	0.066 J	7.6	4.9	6.9 U	0.18 J	0.89
Anthracene	50	0.34 U	41	47 D	1.1	0.097 J	0.41
Benzo(g,h,i)perylene	50	0.34 U	2.9 J	2.5 J	2.1	0.16 J	0.8
Fluoranthene	50	0.2 J	46	**51 D**	16 D	0.75	3.4 D
Fluorene	50	0.34 U	**63**	**62 D**	0.8	0.083 J	0.23 J
Naphthalene	13	0.087 J	**410**	**320 D**	0.62	0.46 J	0.61
Phenanthrene	50	0.11 J	**130**	**160 D**	1.9	0.28 J	2.3
Pyrene	50	0.26 J	**58**	**71 D**	27 D	2.1	6.9 D
Total Non-Carcinogenic PAHs		0.723	1121.5	899.4	50.06	4.456	15.885
Total PAHs		1.229	1216.2	977.28	93.36	7.068	28.875
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		GP-07	GP-08	GP-09	GP-10	GP-11	GP-12
		1.50	8-10	8-11	1.50	1.50	1.50
		GP-07	RP-GP08 (8-10)	RB-GP09 (8-11)	GP-10	GP-11	GP-12
		10/16/1998	10/19/1998	10/19/1998	10/19/1998	10/19/1998	10/20/1998
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	**15.2**	**10.5**	**11.2**	4.7	4.7	5.0
Barium	300	9.4 B	41 B	45.1 B	12.2 B	9.8 B	21.5 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.3 B	0.9 B	**1.2 B**	0.3 B	0.2 B	0.8 U
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	3.0	9.8	7.1	2.8	2.2	4.7
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	18	50.7	94.6	19.7	13.1	140
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.7 U	1.4	1.5	0.7 U	0.7 U	0.7 U
Silver	NE*	0.3 U	0.8 B	0.4 B	0.3 U	0.3 U	0.3 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	1.0 U	2.9	NA	1.0 U	2.5	1.5
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	860 U	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	860 U	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	860 U	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	86 U	NA	NA	NA
4,4'-DDE	2100	NA	NA	86 U	NA	NA	NA
4,4'-DDT	2100	NA	NA	86 U	NA	NA	NA
Aldrin	41	NA	NA	42 U	NA	NA	NA
alpha-BHC	110	NA	NA	42 U	NA	NA	NA
alpha-Chlordane	NE	NA	NA	42 U	NA	NA	NA
beta-BHC	200	NA	NA	42 U	NA	NA	NA
delta-BHC	300	NA	NA	42 U	NA	NA	NA
Dieldrin	44	NA	NA	86 U	NA	NA	NA
Endosulfan I	900	NA	NA	42 U	NA	NA	NA
Endosulfan II	900	NA	NA	86 U	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	86 U	NA	NA	NA
Endrin	100	NA	NA	86 U	NA	NA	NA
Endrin aldehyde	NE	NA	NA	86 U	NA	NA	NA
Endrin ketone	NE	NA	NA	86 U	NA	NA	NA
gamma-Chlordane	540	NA	NA	42 U	NA	NA	NA
Heptachlor	100	NA	NA	42 U	NA	NA	NA
Heptachlor epoxide	20	NA	NA	42 U	NA	NA	NA
Lindane	NE	NA	NA	42 U	NA	NA	NA
Methoxychlor	NE	NA	NA	420 U	NA	NA	NA
Toxaphene	NE	NA	NA	4200 U	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		GP-13	GP-15	GP-16	GP-17	GP-18	GP-20
		1.50	1.50	4.50	1.50	1.50	1.50
		GP-13	GP-15	GP-16	GP-17	GP-18	GP-20
		10/16/1998	10/16/1998	10/20/1998	10/20/1998	10/20/1998	10/21/1998
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.0011 U	0.0010 U	0.0010 U	0.0021	0.0011	0.0010 U
Ethyl benzene	5.5	0.0011 U	0.0010 U	0.0010 U	0.0022	0.0014	0.0010 U
Toluene	1.5	0.0011 U	0.0010 U	0.0010 U	0.0014	0.0010 U	0.0010 U
Xylene (total)	1.2	0.0011 U	0.0006 J	0.0010 U	0.0018	0.0011	0.0010 U
Total BTEX		0	0.0006	0	0.0075	0.0036	0
Other Volatile Organic Compounds (ug/kg)							
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**1.5**	**2.7**	0.35 U	**3.6 D**	**2.5 D**	**0.56**
Benzo(a)pyrene	0.061	**1.1**	**1.9**	0.35 U	**1.7**	**1.7**	**0.39**
Benzo(b)fluoranthene	1.1	**2.3**	**2.1 D**	0.35 U	**3.7 D**	**2.1 D**	0.63
Benzo(k)fluoranthene	1.1	0.6	**1.1**	0.35 U	**1.1**	**1.5**	0.16 J
Chrysene	0.4	**1.6**	**2.9 D**	0.35 U	**4.3 D**	**2.6 D**	**0.69**
Dibenzo(a,h)anthracene	0.014	**0.13 J**	0.35 U	0.35 U	**0.34 J**	**0.18 J**	**0.092 J**
Indeno(1,2,3-cd)pyrene	3.2	0.37 J	0.49	0.35 U	1.0	0.75	0.28 J
Total Carcinogenic PAHs		7.6	11.19	0	15.74	11.33	2.802
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.1 J	0.6	0.35 U	0.55	0.22 J	0.066 J
Acenaphthene	50	0.38 U	0.35 U	0.35 U	0.036 J	0.35 U	0.34 U
Acenaphthylene	41	0.99	0.92	0.35 U	0.72	0.85	0.2 J
Anthracene	50	0.22 J	0.4	0.35 U	0.4	0.46	0.12 J
Benzo(g,h,i)perylene	50	0.34 J	0.38	0.35 U	0.99	0.63	0.25 J
Fluoranthene	50	1.6 DJ	2.9 D	0.35 U	3.6 D	4 D	0.77
Fluorene	50	0.14 J	0.15 J	0.35 U	0.16 J	0.19 J	0.056 J
Naphthalene	13	0.12 J	0.85	0.35 U	0.55	0.4	0.057 J
Phenanthrene	50	0.78	0.87	0.35 U	2.1	2.5 D	0.57
Pyrene	50	6.2 D	8.9 D	0.35 U	11 D	6.8 D	1.3
Total Non-Carcinogenic PAHs		10.49	15.97	0	20.106	16.05	3.389
Total PAHs		18.09	27.16	0	35.846	27.38	6.191
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		GP-13	GP-15	GP-16	GP-17	GP-18	GP-20
		1.50	1.50	4.50	1.50	1.50	1.50
		GP-13	GP-15	GP-16	GP-17	GP-18	GP-20
		10/16/1998	10/16/1998	10/20/1998	10/20/1998	10/20/1998	10/21/1998
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	3.7	15.4	1.3 B	12.2	7	2.7
Barium	300	14.7 B	12.5 B	7.2 B	38 B	24.1 B	21.8 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.3 B	0.2 B	0.2 B	0.5 B	0.6 B	0.4 B
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	7.9	2.3	2.1	4.1	3.2	3.7
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	146	56.3	1.6	109	138	109
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.8 U	1.3	0.7 U	0.7 U	0.7 U	0.7 U
Silver	NE*	1.5 B	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	1.1 U	4	1.0 U	13.6	1.0 U	3.3
PCBs (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		GP-22	GP-23	RPSB-13	RPSB-19	RPSB-93
		1.50	1.50	4-6	4-6	6-8
		GP-22	GP-23	RPSB-13 (4-6)	RPSB-19 (4-6)	RPSB93 (6-8)
		10/20/1998	10/21/1998	01/13/2000	12/30/1999	11/01/2001
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.0017	0.0010 U	0.001 U	**39**	0.001 U
Ethyl benzene	5.5	0.0010 U	0.0010 U	0.001 U	**180**	0.001 U
Toluene	1.5	0.0026	0.0010 U	0.001 J	3.2 U	0.001 U
Xylene (total)	1.2	0.0009 J	0.0005 J	0.002	**200**	0.007
Total BTEX		0.0052	0.0005	0.003	419	0.007
Other Volatile Organic Compounds (ug/kg)						
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**36 D**	**1.8**	0.34 U	**56**	0.35 U
Benzo(a)pyrene	0.061	**14**	**1.4**	0.34 U	**48**	0.35 U
Benzo(b)fluoranthene	1.1	**28 D**	**2.2**	0.34 U	**49**	0.35 U
Benzo(k)fluoranthene	1.1	**6.8**	0.67	0.34 U	**20**	0.35 U
Chrysene	0.4	**39 D**	**2.1**	0.34 U	**49**	0.35 U
Dibenzo(a,h)anthracene	0.014	**1.9**	**0.29 J**	0.34 U	**7.4**	0.35 U
Indeno(1,2,3-cd)pyrene	3.2	**5.4**	0.8	0.34 U	**28**	0.35 U
Total Carcinogenic PAHs		131.1	9.26	0	257.4	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	1.6 J	0.52	0.34 U	**300 D**	0.35 U
Acenaphthene	50	0.52 J	0.055 J	0.34 U	**56**	0.35 U
Acenaphthylene	41	7	0.67	0.34 U	18	0.35 U
Anthracene	50	2.6	0.31 J	0.34 U	**57**	0.35 U
Benzo(g,h,i)perylene	50	4.7	0.82	0.34 U	34	0.35 U
Fluoranthene	50	49 D	2.2	0.34 U	**61**	0.35 U
Fluorene	50	2.2	0.21 J	0.34 U	**57**	0.35 U
Naphthalene	13	1.3 J	0.62	0.34 U	**820 D**	0.35 U
Phenanthrene	50	22	2.5	0.34 U	**230 D**	0.35 U
Pyrene	50	**89 D**	4.5 D	0.34 U	**170 D**	0.35 U
Total Non-Carcinogenic PAHs		179.92	12.405	0	1803	0
Total PAHs		311.02	21.665	0	2060.4	0
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	340 U	**7500**	350 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		GP-22	GP-23	RPSB-13	RPSB-19	RPSB-93
		1.50	1.50	4-6	4-6	6-8
		GP-22	GP-23	RPSB-13 (4-6)	RPSB-19 (4-6)	RPSB93 (6-8)
		10/20/1998	10/21/1998	01/13/2000	12/30/1999	11/01/2001
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	**7.7**	2.6	0.51 B	**15.4**	NA
Barium	300	30.8 B	18.7 B	3.3 B*	34.9 E	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	0.7 B	0.5 B	0.32 B	**1.3**	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	4.4	3.8	1.8 B	**16.5**	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	182	87.5	2.2 *	150	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	0.1 U	0.1 U	0.017 U	**0.45**	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	0.7 U	0.7 U	0.38 U	**3.5**	NA
Silver	NE*	0.3 U	0.3 U	0.29 U	5.8	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	3.8	5.1	0.039 U	2.8	7 U
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-94	RPSB-95	RPSB-96	TP-01B	TP-01C
		4-6	4-6	4-6	9-10	0.03
		RPSB-94 (4-6)	RPSB-95 (4-6)	RPSB-96 (4-6)	RPTP-1 (9-10)	TP-1
		10/31/2001	10/31/2001	11/05/2001	10/25/1995	10/22/1998
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.001 U	**0.81**	0.0056 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	1.57	0.0056 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.3	0.0056 U
Xylene (total)	1.2	0.001 U	0.001 U	0.005	0.87	0.0056 U
Total BTEX		0	0	0.005	3.55	0
Other Volatile Organic Compounds (ug/kg)						
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	760	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	140 U	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.34 U	0.38 U	**0.97**	**0.52**	**1.5**
Benzo(a)pyrene	0.061	0.34 U	0.38 U	**0.98**	**0.36**	**1.2**
Benzo(b)fluoranthene	1.1	0.34 U	0.38 U	**2**	0.17	**2.6 D**
Benzo(k)fluoranthene	1.1	0.34 U	0.38 U	0.9	0.20	0.71
Chrysene	0.4	0.34 U	0.38 U	**1.2**	**0.59**	**1.7**
Dibenzo(a,h)anthracene	0.014	0.34 U	0.38 U	**0.25 J**	0.14 U	**0.35 J**
Indeno(1,2,3-cd)pyrene	3.2	0.34 U	0.38 U	0.71	0.10 J	1.2
Total Carcinogenic PAHs		0	0	7.01	1.94	9.26
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.34 U	0.38 U	0.39 U	3.20	1.6
Acenaphthene	50	0.34 U	0.38 U	0.39 U	5.80	0.092 J
Acenaphthylene	41	0.34 U	0.38 U	1.4	0.27	1.1 J
Anthracene	50	0.34 U	0.38 U	0.44	2.97	0.24 J
Benzo(g,h,i)perylene	50	0.34 U	0.38 U	0.79	0.13 J	1.0
Fluoranthene	50	0.34 U	0.38 U	0.9	1.48	1.1
Fluorene	50	0.34 U	0.38 U	0.39 U	3.51	0.15 J
Naphthalene	13	0.34 U	0.38 U	0.065 J	8.49	2.6
Phenanthrene	50	0.34 U	0.38 U	0.22 J	8.51	1.2
Pyrene	50	0.34 U	0.38 U	1.7	2.22	2.7 D
Total Non-Carcinogenic PAHs		0	0	5.515	36.58	11.782
Total PAHs		0	0	12.525	38.52	21.042
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	6.80	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	340 U	380 U	390 U	530	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-94 4-6 RPSB-94 (4-6) 10/31/2001	RPSB-95 4-6 RPSB-95 (4-6) 10/31/2001	RPSB-96 4-6 RPSB-96 (4-6) 11/05/2001	TP-01B 9-10 RPTP-1 (9-10) 10/25/1995	TP-01C 0.03 TP-1 10/22/1998
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	**34**
Barium	300	NA	NA	NA	NA	51.8
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	0.3 B
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	3.9
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	108
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	0.1 U
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	**6.2**
Silver	NE*	NA	NA	NA	NA	0.3 U
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.35 U	0.35 U	12.8	NA	262
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		TP-02C		TP-04C	TP-07C	TP-19B
		0-3 RB-TP2 (0-3) 10/22/1998	0-3 TP-2 10/22/1998	6.00 TP-4 10/21/1998	0.50 TP-7 10/22/1998	8-8.5 RPTP-19 (8-8.5) 10/24/1995
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	NA	0.0074 U	1.6 U	0.0063 J	**120**
Ethyl benzene	5.5	NA	0.0074 U	**60**	0.0074 U	**496**
Toluene	1.5	NA	0.0074 U	1.6 U	0.008	**783**
Xylene (total)	1.2	NA	0.0074 U	**6.7**	0.0074 U	823
Total BTEX		NA	0	66.7	0.0143	2222
Other Volatile Organic Compounds (ug/kg)						
2-Butanone	300	5.1 U	NA	NA	NA	NA
2-Hexanone	NE	5.1 U	NA	NA	NA	NA
Acetone	200	10.0	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	175000
Carbon disulfide	2700	5.1 U	NA	NA	NA	NA
Chlorobenzene	1700	5.1 U	NA	NA	NA	NA
Methylene chloride	100	11.0	NA	NA	NA	NA
Styrene	NE	5.1 U	NA	NA	NA	140 U
Tetrachloroethene	1400	5.1 U	NA	NA	NA	NA
Trichloroethene	700	5.1 U	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**11**	NA	**28 DJ**	0.22 J	**119**
Benzo(a)pyrene	0.061	**5.4**	NA	**25**	**0.15 J**	**75.4**
Benzo(b)fluoranthene	1.1	**8**	NA	**29**	0.2 J	**32.5**
Benzo(k)fluoranthene	1.1	**2.6**	NA	**8.9**	0.065 J	**49.5**
Chrysene	0.4	**13**	NA	**25**	0.26 J	**107**
Dibenzo(a,h)anthracene	0.014	**0.83 J**	NA	**2.0 J**	0.49 U	**8.16**
Indeno(1,2,3-cd)pyrene	3.2	1.7 J	NA	**7.2**	0.088 J	**24**
Total Carcinogenic PAHs		42.53	NA	125.1	0.983	415.56
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	2 U	NA	**220 D**	0.058 J	**480**
Acenaphthene	50	2 U	NA	33	0.49 U	**191**
Acenaphthylene	41	2.9	NA	6.1	0.064 J	**110**
Anthracene	50	1.4 J	NA	33	0.49 U	**212**
Benzo(g,h,i)perylene	50	1.5 J	NA	6.1	0.082 J	26.5
Fluoranthene	50	17 D	NA	42 D	0.22 J	**172**
Fluorene	50	0.45 J	NA	28	0.49 U	**181**
Naphthalene	13	2 U	NA	**200 D**	0.17 J	**957**
Phenanthrene	50	2	NA	**78 D**	0.11 J	**537**
Pyrene	50	45 D	NA	**59 D**	0.35 J	**263**
Total Non-Carcinogenic PAHs		70.25	NA	705.2	1.054	3129.5
Total PAHs		112.78	NA	830.3	2.037	3545.06
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	2000 U	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA	291
2,4-Dimethylphenol	NE	2000 U	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	2000 U	NA	NA	NA	NA
2-Methylphenol	100	2000 U	NA	NA	NA	NA
4-Methylphenol	900	2000 U	NA	NA	NA	NA
Benzene, hydroxy-	NE	**2000 U**	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	2000 U	NA	NA	NA	NA
Butylbenzylphthalate	50000	2000 U	NA	NA	NA	NA
Carbazole	NE	2000 U	NA	NA	NA	NA
Dibenzofuran	6200	200 J	NA	NA	NA	**25500**
Di-n-butylphthalate	8100	2000 U	NA	NA	NA	NA
Di-n-octylphthalate	50000	2000 U	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	190 J	NA	NA	NA	NA

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		TP-02C		TP-04C	TP-07C	TP-19B
		0-3 RB-TP2 (0-3) 10/22/1998	0-3 TP-2 10/22/1998	6.00 TP-4 10/21/1998	0.50 TP-7 10/22/1998	8-8.5 RPTP-19 (8-8.5) 10/24/1995
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	**12.4**	4.9	**41.5**	NA
Barium	300	NA	13.4 B	51.2	140.1	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	0.1 B	**2.0**	0.5 B	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	2.1	**12**	6.5	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	30.1	28.1	51	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	0.1 U	0.1 U	**0.2**	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	0.8 B	1.9	**5.3**	NA
Silver	NE*	NA	0.3 U	0.3 U	0.6 B	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	NA	1.9	17.2	24.7	NA
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	34 U	NA	NA	NA
Aroclor 1254	1000/10000	NA	34 U	NA	NA	NA
Aroclor 1260	1000/10000	NA	34 U	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	3.4 U	NA	NA	NA
4,4'-DDE	2100	NA	3.4 U	NA	NA	NA
4,4'-DDT	2100	NA	3.4 U	NA	NA	NA
Aldrin	41	NA	1.7 U	NA	NA	NA
alpha-BHC	110	NA	1.7 U	NA	NA	NA
alpha-Chlordane	NE	NA	1.7 U	NA	NA	NA
beta-BHC	200	NA	1.7 U	NA	NA	NA
delta-BHC	300	NA	1.7 U	NA	NA	NA
Dieldrin	44	NA	3.4 U	NA	NA	NA
Endosulfan I	900	NA	3.4 U	NA	NA	NA
Endosulfan II	900	NA	3.4 U	NA	NA	NA
Endosulfan sulfate	1000	NA	3.4 U	NA	NA	NA
Endrin	100	NA	3.4 U	NA	NA	NA
Endrin aldehyde	NE	NA	3.4 U	NA	NA	NA
Endrin ketone	NE	NA	3.4 U	NA	NA	NA
gamma-Chlordane	540	NA	1.7 U	NA	NA	NA
Heptachlor	100	NA	1.7 U	NA	NA	NA
Heptachlor epoxide	20	NA	1.7 U	NA	NA	NA
Lindane	NE	NA	1.7 U	NA	NA	NA
Methoxychlor	NE	NA	1.7 U	NA	NA	NA
Toxaphene	NE	NA	170 U	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	3600
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	90
p-Cresol (TCLP)	NE	NA	NA	NA	NA	140
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	6.0 U
Barium (TCLP)	NE	NA	NA	NA	NA	112 B
Cadmium (TCLP)	NE	NA	NA	NA	NA	2.3 B
Chromium (TCLP)	NE	NA	NA	NA	NA	7 U
Lead (TCLP)	NE	NA	NA	NA	NA	104 B
Selenium (TCLP)	NE	NA	NA	NA	NA	3 U
Silver (TCLP)	NE	NA	NA	NA	NA	2 U

Table 4-6 (continued)
Soil Analytical Results
Former Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-7
Soil Analytical Results
Former Electric Substation Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		B-04		GP-20	MW-01
		23.00 RB-112089-B4 11/20/1998	23.00 RB-112098-B4 11/20/1998	13-14 RB-GP20 (13-14) 10/20/1998	15-16 RB-MW1D (15-16) 10/22/1998
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	NA	0.0016	0.013	**0.34**
Ethyl benzene	5.5	NA	0.002	0.0086	0.25
Toluene	1.5	NA	0.0011	0.006 U	0.15 U
Xylene (total)	1.2	NA	0.0023	0.0098	0.15 U
Total BTEX		NA	0.007	0.0314	0.59
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	NA	0.37 U	**0.67**	**1.8**
Benzo(a)pyrene	0.061	NA	0.37 U	**0.82**	**2.1**
Benzo(b)fluoranthene	1.1	NA	0.37 U	0.71	**2**
Benzo(k)fluoranthene	1.1	NA	0.37 U	0.16 J	0.61
Chrysene	0.4	NA	0.37 U	**0.74**	**1.8**
Dibenzo(a,h)anthracene	0.014	NA	0.37 U	**0.069 J**	**0.12 J**
Indeno(1,2,3-cd)pyrene	3.2	NA	0.37 U	0.27 J	0.47
Total Carcinogenic PAHs		NA	0	3.439	8.9
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	NA	0.37 U	0.26 J	0.96
Acenaphthene	50	NA	0.37 U	2.6	0.33 J
Acenaphthylene	41	NA	0.37 U	0.12	2.9 D
Anthracene	50	NA	0.37 U	0.19 J	0.97
Benzo(g,h,i)perylene	50	NA	0.37 U	0.29 J	0.4 J
Fluoranthene	50	NA	0.37 U	0.69	2.3
Fluorene	50	NA	0.369 U	0.59	1.1
Naphthalene	13	NA	0.047 J	2.7	7.9 D
Phenanthrene	50	NA	0.37 U	0.77	2.9
Pyrene	50	NA	0.37 U	1.6	2.9
Total Non-Carcinogenic PAHs		NA	0.047	9.81	22.66
Total PAHs		NA	0.047	13.249	31.56
Other Semivolatile Organic Compounds (ug/kg)					
2-Chloronaphthalene	NE	NA	370 U	400 U	400 U
Dibenzofuran	6200	NA	NA	NA	NA
Metals (mg/kg)					
Arsenic	7.5	0.3 U	NA	2.4	NA
Barium	300	1.3 U	NA	14 B	NA
Cadmium	1	0.07 U	NA	0.2 B	NA
Chromium	10	1.2 B	NA	4.8	NA
Lead	NE*	0.6 B	NA	20.8	NA
Mercury	0.1	0.11 U	NA	0.1 U	NA
Selenium	2	0.74 U	NA	0.8 U	NA
Silver	NE*	1.3 B	NA	0.3 U	NA
Total Cyanide (mg/kg)					
Cyanide	NE	1.1 U	NA	1.2 U	NA

Table 4-7 (continued)
Soil Analytical Results
Former Electric Substation Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-125	RPSB-126	RPSB-129
		17-25	12-17	15-17
		RPSB-125 (17-25)	RPSB-126 (12-17)	RPSB-129 (15-17)
		08/21/2002	08/20/2002	08/22/2002
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	3 U	**0.22**	**36**
Ethyl benzene	5.5	**100**	0.75	**100**
Toluene	1.5	3 U	0.063	1.2 U
Xylene (total)	1.2	**57**	0.14	**43**
Total BTEX		157	1.173	179
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	**42 JD**	**0.44 J**	**28 J**
Benzo(a)pyrene	0.061	**27 JD**	**0.39 J**	**19 J**
Benzo(b)fluoranthene	1.1	**29 J**	0.41 J	**14 J**
Benzo(k)fluoranthene	1.1	**9.6 J**	0.16 J	**6.8 J**
Chrysene	0.4	**42 JD**	**0.53 J**	**27 J**
Dibenzo(a,h)anthracene	0.014	**2.9 J**	0.74 U	40 U
Indeno(1,2,3-cd)pyrene	3.2	**8.2**	0.14 J	**4.7 J**
Total Carcinogenic PAHs		160.7	2.07	99.5
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	**580 D**	2.7	**280**
Acenaphthene	50	**280 D**	0.42 J	**150**
Acenaphthylene	41	20	0.13 J	9 J
Anthracene	50	**96 JD**	1.1	**56**
Benzo(g,h,i)perylene	50	7.6 J	0.16 J	4.9 J
Fluoranthene	50	**78 JD**	0.93	**55**
Fluorene	50	**130 JD**	0.91	**81**
Naphthalene	13	**810 D**	7.9	**510**
Phenanthrene	50	**340 D**	1.4	**210**
Pyrene	50	**130 JD**	1.1	**84**
Total Non-Carcinogenic PAHs		2471.6	16.75	1439.9
Total PAHs		2632.3	18.82	1539.4
Other Semivolatile Organic Compounds (ug/kg)				
2-Chloronaphthalene	NE	NA	NA	NA
Dibenzofuran	6200	**9700**	740 U	5400 J
Metals (mg/kg)				
Arsenic	7.5	NA	NA	NA
Barium	300	NA	NA	NA
Cadmium	1	NA	NA	NA
Chromium	10	NA	NA	NA
Lead	NE*	NA	NA	NA
Mercury	0.1	NA	NA	NA
Selenium	2	NA	NA	NA
Silver	NE*	NA	NA	NA
Total Cyanide (mg/kg)				
Cyanide	NE	0.25 U	0.27 U	0.27 U

Table 4-7 (continued)
Soil Analytical Results
Former Electric Substation Area (12-24 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-8
Soil Analytical Results
Former Electric Substation Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		BOR-B	RPSB-125	RPSB-126	RPSB-129	RPSB-13
		29.75	25-27	27-37	37-47	30-32
		BOR-B	RPSB-125 (25-27)	RPSB-126 (27-37)	RPSB-129 (37-47)	RPSB-13 (30-32)
		10/22/1998	08/21/2002	08/20/2002	08/22/2002	01/13/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	1.4 U	1.2 U	0.002	**0.074**	0.001 U
Ethyl benzene	5.5	**51**	**120**	0.001 U	0.002	0.002
Toluene	1.5	1.4 U	1.2 U	0.002	0.001	0.002
Xylene (total)	1.2	**5.8**	**45**	0.002	0.002	0.004
Total BTEX		56.8	165	0.006	0.079	0.008
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**79 DJ**	**40 JD**	0.39 U	0.42 U	0.39 U
Benzo(a)pyrene	0.061	**50 DJ**	**28 JD**	0.39 U	0.42 U	0.39 U
Benzo(b)fluoranthene	1.1	**31 DJ**	**28 J**	0.39 U	0.42 U	0.39 U
Benzo(k)fluoranthene	1.1	**9.5**	**9.4 J**	0.39 U	0.42 U	0.39 U
Chrysene	0.4	**65 DJ**	**40 JD**	0.39 U	0.42 U	0.39 U
Dibenzo(a,h)anthracene	0.014	**2.4**	**2.7 J**	0.39 U	0.42 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	**5.9**	**7.2 J**	0.39 U	0.42 U	0.39 U
Total Carcinogenic PAHs		242.8	155.3	0	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	**710 D**	**460 D**	0.39 U	0.42 U	0.39 U
Acenaphthene	50	**390 D**	**240 D**	0.39 U	0.42 U	0.39 U
Acenaphthylene	41	19 DJ	17	0.39 U	0.42 U	0.39 U
Anthracene	50	**170 D**	**90 D**	0.39 U	0.42 U	0.39 U
Benzo(g,h,i)perylene	50	5.7	7 J	0.39 U	0.42 U	0.39 U
Fluoranthene	50	**120 D**	**74 JD**	0.39 U	0.42 U	0.39 U
Fluorene	50	**200 D**	**120 D**	0.39 U	0.42 U	0.39 U
Naphthalene	13	**660 D**	**520 D**	0.39 U	0.42 U	0.39 U
Phenanthrene	50	**600 D**	**300 D**	0.39 U	0.078 J	0.39 U
Pyrene	50	**300 D**	**120 D**	0.39 U	0.42 U	0.39 U
Total Non-Carcinogenic PAHs		3174.7	1948	0	0.078	0
Total PAHs		3417.5	2103.3	0	0.078	0
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	NA	NA	NA	NA	12000 U
Dibenzofuran	6200	NA	**7900**	390 U	420 U	390 U
Metals (mg/kg)						
Arsenic	7.5	NA	NA	NA	NA	0.29 U
Barium	300	NA	NA	NA	NA	2.5 B*
Cadmium	1	NA	NA	NA	NA	0.19 U
Chromium	10	NA	NA	NA	NA	2.1
Lead	NE*	NA	NA	NA	NA	1.8 *
Mercury	0.1	NA	NA	NA	NA	0.019 U
Selenium	2	NA	NA	NA	NA	0.39 U
Silver	NE*	NA	NA	NA	NA	0.29 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	NA	0.27 U	0.25 U	0.32 B	0.079 B
Total Phenols (mg/kg)						
Total Phenols	NE	NA	NA	NA	NA	12 U

Table 4-8 (continued)
Soil Analytical Results
Former Electric Substation Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-13	RPSB-19	RPSB-95	RPSB-96
		38-40	30-32	36-38	38-40
		RPSB-13 (38-40)	RPSB-19 (30-32)	RPSB-95 (36-38)	RPSB96 (38-40)
		01/14/2000	01/03/2000	10/31/2001	11/06/2001
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.004	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.012	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.01	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.023	0.001 U	0.001 U
Total BTEX		0	0.049	0	0
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.38 U	0.4 U	0.41 U	0.4 U
Benzo(a)pyrene	0.061	0.38 U	0.4 U	0.41 U	0.4 U
Benzo(b)fluoranthene	1.1	0.38 U	0.4 U	0.41 U	0.4 U
Benzo(k)fluoranthene	1.1	0.38 U	0.4 U	0.41 U	0.4 U
Chrysene	0.4	0.38 U	0.4 U	0.41 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.38 U	0.4 U	0.41 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.38 U	0.4 U	0.41 U	0.4 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.38 U	0.4 U	0.41 U	0.4 U
Acenaphthene	50	0.38 U	0.4 U	0.41 U	0.4 U
Acenaphthylene	41	0.38 U	0.4 U	0.41 U	0.4 U
Anthracene	50	0.38 U	0.4 U	0.41 U	0.4 U
Benzo(g,h,i)perylene	50	0.38 U	0.4 U	0.41 U	0.4 U
Fluoranthene	50	0.38 U	0.068 J	0.41 U	0.4 U
Fluorene	50	0.38 U	0.4 U	0.41 U	0.4 U
Naphthalene	13	0.38 U	0.4 U	0.41 U	0.4 U
Phenanthrene	50	0.38 U	0.15 J	0.41 U	0.4 U
Pyrene	50	0.38 U	0.092 J	0.41 U	0.4 U
Total Non-Carcinogenic PAHs		0	0.31	0	0
Total PAHs		0	0.31	0	0
Other Semivolatile Organic Compounds (ug/kg)					
Benzene, hydroxy-	NE	13000 U	14000 U	NA	NA
Dibenzofuran	6200	380 U	400 U	410 U	400 U
Metals (mg/kg)					
Arsenic	7.5	0.94 B	0.36 U	NA	NA
Barium	300	1.8 B	3.1 B	NA	NA
Cadmium	1	0.21 U	0.24 U	NA	NA
Chromium	10	1.5 B	3.2	NA	NA
Lead	NE*	0.68 B	0.87 B	NA	NA
Mercury	0.1	0.018 U	0.037 B	NA	NA
Selenium	2	0.41 U	0.48 U	NA	NA
Silver	NE*	0.31 U	0.36 U	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.27 B	0.045 U	0.39 U	7 U
Total Phenols (mg/kg)					
Total Phenols	NE	13 U	14 U	NA	NA

Table 4-8 (continued)
Soil Analytical Results
Former Electric Substation Area (24-45 feet)
Rockaway Park Former MGP Site

Notes:

* site background

NE - not established

NA - not analyzed

ND - indicates standard is applicable to analyte detection limit

J - estimated value

U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis

D - identifies all compounds in the analysis completed at secondary dilution factor

B - analyte was found within the laboratory method blank as well as the sample

N - spiked sample recovery was not within control limits (metals)

E - compound concentration exceeds the calibration range

P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.

Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.

TCLP - Toxicity Characteristic Leaching Procedure

mg/kg - milligrams/kilogram or parts per million (ppm)

ug/kg - micrograms/kilogram or parts per billion (ppb)

BTEX is benzene, toluene, ethylbenzene, and xylene.

PAHs are polycyclic aromatic hydrocarbons.

Table 4-9
Soil Analytical Results
Former Electric Substation Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPMW-18D		RPSB-125	RPSB-126	RPSB-19
		52-55 RPMW-180 (52-55) 08/21/2002	81-83 RPMW-18D (81-83) 08/21/2002	63-67 RPSB-125 (63-67) 08/21/2002	47-57 RPSB-126 (47-57) 08/20/2002	45-47 RPSB-19 (45-47) 01/03/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.28 U	0.24 U	0.001 U	0.003	0.001 U
Ethyl benzene	5.5	**14**	**12**	0.006	0.002	0.001
Toluene	1.5	0.28 U	1.5	0.001 U	0.009	0.001 U
Xylene (total)	1.2	**5.2**	**41**	0.002	0.006	0.002
Total BTEX		19.2	54.5	0.008	0.02	0.003
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**46**	**50 JD**	0.2 J	0.42 U	0.39 U
Benzo(a)pyrene	0.061	**35 J**	**34 JD**	**0.14 J**	0.42 U	0.39 U
Benzo(b)fluoranthene	1.1	**27 J**	**27 JD**	0.098 J	0.42 U	0.39 U
Benzo(k)fluoranthene	1.1	**13 J**	**18 J**	0.049 J	0.42 U	0.39 U
Chrysene	0.4	**47**	**48 JD**	0.2 J	0.42 U	0.39 U
Dibenzo(a,h)anthracene	0.014	38 U	**3.3 J**	0.43 U	0.42 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	**7.5 J**	**8.7 J**	0.43 U	0.42 U	0.39 U
Total Carcinogenic PAHs		175.5	189	0.687	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	**220**	**380 D**	0.15 J	0.42 U	0.39 U
Acenaphthene	50	41	28	0.2 J	0.42 U	0.39 U
Acenaphthylene	41	**210**	**270 D**	0.42 J	0.42 U	0.39 U
Anthracene	50	**100**	**110 D**	0.43	0.42 U	0.39 U
Benzo(g,h,i)perylene	50	6.4 J	8.4 J	0.044 J	0.42 U	0.39 U
Fluoranthene	50	**86**	**92 JD**	0.37 J	0.42 U	0.39 U
Fluorene	50	**140**	**160 D**	0.34 J	0.42 U	0.39 U
Naphthalene	13	**320**	**630 D**	0.2 J	0.42 U	0.39 U
Phenanthrene	50	**320**	**370 D**	1.4	0.42 U	0.39 U
Pyrene	50	**140**	**160 D**	0.59	0.42 U	0.39 U
Total Non-Carcinogenic PAHs		1583.4	2208.4	4.144	0	0
Total PAHs		1758.9	2397.4	4.831	0	0
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	NA	NA	NA	NA	14000 U
Dibenzofuran	6200	**12000 J**	**10000**	430 U	420 U	390 U
Metals (mg/kg)						
Arsenic	7.5	NA	NA	NA	NA	0.42 B
Barium	300	NA	NA	NA	NA	1.7 B
Cadmium	1	NA	NA	NA	NA	0.2 U
Chromium	10	NA	NA	NA	NA	1.6 B
Lead	NE*	NA	NA	NA	NA	0.7 B
Mercury	0.1	NA	NA	NA	NA	0.02 U
Selenium	2	NA	NA	NA	NA	0.45 B
Silver	NE*	NA	NA	NA	NA	0.3 U
Total Cyanide (mg/kg)						
Cyanide	NE	0.27 U	0.28 U	0.31 U	0.28 U	0.058 B
Total Phenols (mg/kg)						
Total Phenols	NE	NA	NA	NA	NA	14 U

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-10
Soil Analytical Results
Former Electric Substation Area (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date	
		RPMW-18D	RPSB-129
		87-97	87-97
		RPMW-18D (87-97)	RPSB-129 (87-97)
		08/21/2002	08/22/2002
Volatile Organic Compounds (VOCs)			
BTEX (mg/kg)			
Benzene	0.06	0.001 U	0.024
Ethyl benzene	5.5	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U
Total BTEX		0	0.024
Semivolatile Organic Compounds (SVOCs)			
Carcinogenic PAHs (mg/kg)			
Benzo(a)anthracene	0.224	0.42 U	0.43 U
Benzo(a)pyrene	0.061	0.42 U	0.43 U
Benzo(b)fluoranthene	1.1	0.42 U	0.43 U
Benzo(k)fluoranthene	1.1	0.42 U	0.43 U
Chrysene	0.4	0.42 U	0.43 U
Dibenzo(a,h)anthracene	0.014	0.42 U	0.43 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 U	0.43 U
Total Carcinogenic PAHs		0	0
Non-Carcinogenic PAHs (mg/kg)			
2-Methylnaphthalene	36.4	0.42 U	0.43 U
Acenaphthene	50	0.42 U	0.43 U
Acenaphthylene	41	0.42 U	0.43 U
Anthracene	50	0.42 U	0.43 U
Benzo(g,h,i)perylene	50	0.42 U	0.43 U
Fluoranthene	50	0.42 U	0.43 U
Fluorene	50	0.42 U	0.43 U
Naphthalene	13	0.42 U	0.43 U
Phenanthrene	50	0.42 U	0.43 U
Pyrene	50	0.42 U	0.43 U
Total Non-Carcinogenic PAHs		0	0
Total PAHs		0	0
Other Semivolatile Organic Compounds (ug/kg)			
Benzene, hydroxy-	NE	NA	NA
Dibenzofuran	6200	420 U	430 U
Metals (mg/kg)			
Arsenic	7.5	NA	NA
Barium	300	NA	NA
Cadmium	1	NA	NA
Chromium	10	NA	NA
Lead	NE*	NA	NA
Mercury	0.1	NA	NA
Selenium	2	NA	NA
Silver	NE*	NA	NA
Total Cyanide (mg/kg)			
Cyanide	NE	0.31 U	0.32 U
Total Phenols (mg/kg)			
Total Phenols	NE	NA	NA

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limi
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysi
D - identifies all compounds in the analysis completed at secondary dilution facto
B - analyte was found within the laboratory method blank as well as the sampl
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns
The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons.

Table 4-11
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		B-12	B-18	B-19	B-20	
		10.15 RB-112398-B12 11/23/1998	9.00 RB-111898-B18 11/18/1998	9.50 RB-111998-B19 11/18/1998	9.25 RB-112098 11/20/1998	9.25 RB-112098-B20 11/20/1998
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	**110**	**260 D**	**1.6 U**	**39**	NA
Toluene	1.5	**2000 DJ**	**530 D**	1.4 J	**440 D**	NA
Ethyl benzene	5.5	**160**	**86**	4.4	**430 D**	NA
Xylene (total)	1.2	**1500 D**	**760 D**	**59**	**720 D**	NA
Total BTEX		3770	1636	66.4	1629	NA
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	15000 U	1500 U	1600 U	NA	1600 U
2-Hexanone	NE	15000 U	1500 U	1600 U	NA	1600 U
Acetone	200	15000 U	1500 U	1600 U	NA	1600 U
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	15000 U	1500 U	1600 U	NA	1600 U
Chlorobenzene	1700	15000 U	1500 U	1600 U	NA	1600 U
Methylene chloride	100	15000 U	1500 U	1600 U	NA	1600 U
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	580000 D	240000 D	1600 U	1600 U	NA
Tetrachloroethene	1700	15000 U	1500 U	1600 U	NA	1600 U
Trichloroethene	700	15000 U	1500 U	1600 U	NA	1600 U
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**1.0000 J**	NA	NA	NA	NA
Benzo(a)pyrene	0.061	**0.5300 J**	NA	NA	NA	NA
Benzo(b)fluoranthene	1.1	0.6800 J	NA	NA	NA	NA
Benzo(k)fluoranthene	1.1	2.4000 U	NA	NA	NA	NA
Chrysene	0.4	**1.0000 J**	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.014	2.4000 U	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	3.2	0.3000 J	NA	NA	NA	NA
Total Carcinogenic PAHs		3.51	NA	NA	NA	NA
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	**69.0000 D**	NA	NA	NA	NA
Acenaphthene	50	1.1000 J	NA	NA	NA	NA
Acenaphthylene	41	1.9000 J	NA	NA	NA	NA
Anthracene	50	2.3000 J	NA	NA	NA	NA
Benzo(g,h,i)perylene	50	0.3500 J	NA	NA	NA	NA
Fluoranthene	50	3.8000	NA	NA	NA	NA
Fluorene	50	1.8000 J	NA	NA	NA	NA
Naphthalene	13	**380.0000 D**	NA	NA	NA	NA
Phenanthrene	50	10.0000	NA	NA	NA	NA
Pyrene	50	4.1000 J	NA	NA	NA	NA
Total Non-Carcinogenic PAHs		474.35	NA	NA	NA	NA
Total PAHs		477.86	NA	NA	NA	NA
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	2400.0 U	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	2400.0 U	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	2400.0 U	NA	NA	NA	NA
2-Methylphenol	100	2400.0 U	NA	NA	NA	NA
4-Methylphenol	900	2400.0 U	NA	NA	NA	NA
Benzene, hydroxy-	NE	2400.0 U	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	260.0 J	NA	NA	NA	NA
Butylbenzylphthalate	50000	2400.0 U	NA	NA	NA	NA
Carbazole	NE	2400.0 U	NA	NA	NA	NA
Dibenzofuran	6200	1100.0 J	NA	NA	NA	NA
Di-n-butylphthalate	8100	2400.0 U	NA	NA	NA	NA
Di-n-octylphthalate	50000	2400.0 U	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	2400.0 U	NA	NA	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		B-12	B-18	B-19	B-20	
		10.15 RB-112398-B12 11/23/1998	9.00 RB-111898-B18 11/18/1998	9.50 RB-111998-B19 11/18/1998	9.25 RB-112098 11/20/1998	9.25 RB-112098-B20 11/20/1998
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	0.4 B	NA	NA	NA	NA
Barium	300	3.2 B	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	0.1 B	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	2.1 B	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	2.3	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	0.1 U	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	0.8 U	NA	NA	NA	NA
Silver	NE*	0.3 U	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	1.2 U	NA	NA	NA	NA
PCBs (ug/kg)						
Aroclor 1242	1000/10000	40 U	NA	NA	NA	NA
Aroclor 1254	1000/10000	40 U	NA	NA	NA	NA
Aroclor 1260	1000/10000	40 U	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	4 U	NA	NA	NA	NA
4,4'-DDE	2100	4 U	NA	NA	NA	NA
4,4'-DDT	2100	4 U	NA	NA	NA	NA
Aldrin	41	2 U	NA	NA	NA	NA
alpha-BHC	110	2 U	NA	NA	NA	NA
alpha-Chlordane	NE	2 U	NA	NA	NA	NA
beta-BHC	200	2 U	NA	NA	NA	NA
delta-BHC	300	2 U	NA	NA	NA	NA
Dieldrin	44	4 U	NA	NA	NA	NA
Endosulfan I	900	2 U	NA	NA	NA	NA
Endosulfan II	900	4 U	NA	NA	NA	NA
Endosulfan sulfate	1000	4 U	NA	NA	NA	NA
Endrin	100	4 U	NA	NA	NA	NA
Endrin aldehyde	NE	4 U	NA	NA	NA	NA
Endrin ketone	NE	4 U	NA	NA	NA	NA
gamma-Chlordane	540	2 U	NA	NA	NA	NA
Heptachlor	100	2 U	NA	NA	NA	NA
Heptachlor epoxide	20	2 U	NA	NA	NA	NA
Lindane	NE	2 U	NA	NA	NA	NA
Methoxychlor	NE	20 U	NA	NA	NA	NA
Toxaphene	NE	200 U	NA	NA	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		B-22			B-23	MW-02
		1.50 RB-112398-B-22 11/23/1998	1.50 RB-112398-B22 11/23/1998	10.00 RB-112398-B22 11/23/1998	9.75 RB-112398-B23 11/23/1998	5.00 RB-112098-B3 11/20/1998
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	NA	NA	**0.068**	**240 D**	NA
Toluene	1.5	NA	NA	0.37	**1700 D**	NA
Ethyl benzene	5.5	NA	NA	0.18	**2800 D**	NA
Xylene (total)	1.2	NA	NA	0.79	**5900 D**	NA
Total BTEX		NA	NA	1.408	10640	NA
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1700	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	NA	**2.6**	2.4 U	**110**	0.35 U
Benzo(a)pyrene	0.061	NA	**5.7 D**	2.4 U	**93**	0.35 U
Benzo(b)fluoranthene	1.1	NA	**4.9 D**	2.4 U	**73**	0.35 U
Benzo(k)fluoranthene	1.1	NA	**1.7 D**	2.4 U	**20 J**	0.35 U
Chrysene	0.4	NA	**4.0 D**	2.4 U	**100**	0.35 U
Dibenzo(a,h)anthracene	0.014	NA	**0.82 D**	2.4 U	**8.7 J**	0.35 U
Indeno(1,2,3-cd)pyrene	3.2	NA	2.9 D	2.4 U	**36**	0.35 U
Total Carcinogenic PAHs		NA	22.62	0	440.7	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	NA	0.31 J	1 J	**440 D**	0.35 U
Acenaphthene	50	NA	0.20 U	2.4 U	**140**	0.35 U
Acenaphthylene	41	NA	0.79 DJ	2.4 U	**52**	0.35 U
Anthracene	50	NA	0.33 J	2.4 U	**160**	0.35 U
Benzo(g,h,i)perylene	50	NA	3.1 D	2.4 U	39	0.35 U
Fluoranthene	50	NA	2.2	2.4 U	**210 DJ**	0.35 U
Fluorene	50	NA	0.077 J	2.4 U	**140**	0.35 U
Naphthalene	13	NA	0.53	8.4	**1300 D**	0.35 U
Phenanthrene	50	NA	0.9	2.4 U	**530 D**	0.35 U
Pyrene	50	NA	5.6 D	2.4 U	**270 D**	0.35 U
Total Non-Carcinogenic PAHs		NA	13.837	9.4	3281	0
Total PAHs		NA	36.457	9.4	3721.7	0
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		B-22			B-23	MW-02
		1.50 RB-112398-B-22 11/23/1998	1.50 RB-112398-B22 11/23/1998	10.00 RB-112398-B22 11/23/1998	9.75 RB-112398-B23 11/23/1998	5.00 RB-112098-B3 11/20/1998
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	3.1	NA	0.4 U	NA	0.3 U
Barium	300	24 B	NA	1.2 B	NA	3.5 B
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	0.4 B	NA	0.07 U	NA	0.09 B
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	4.1	NA	1.2 B	NA	2.17
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	46.3	NA	0.7 B	NA	1.1
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	0.7	NA	0.1 U	NA	0.1 U
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	0.7 U	NA	0.8 U	NA	0.69 U
Silver	NE*	0.3 U	NA	0.3 U	NA	0.3 U
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	4.0	NA	1.2 U	NA	3.1
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	34 U
Aroclor 1254	1000/10000	NA	NA	NA	NA	34 U
Aroclor 1260	1000/10000	NA	NA	NA	NA	34 U
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	3.4 U
4,4'-DDE	2100	NA	NA	NA	NA	3.4 U
4,4'-DDT	2100	NA	NA	NA	NA	3.4 U
Aldrin	41	NA	NA	NA	NA	1.7 U
alpha-BHC	110	NA	NA	NA	NA	1.7 U
alpha-Chlordane	NE	NA	NA	NA	NA	1.7 U
beta-BHC	200	NA	NA	NA	NA	1.7 U
delta-BHC	300	NA	NA	NA	NA	1.7 U
Dieldrin	44	NA	NA	NA	NA	3.4 U
Endosulfan I	900	NA	NA	NA	NA	1.7 U
Endosulfan II	900	NA	NA	NA	NA	3.4 U
Endosulfan sulfate	1000	NA	NA	NA	NA	3.4 U
Endrin	100	NA	NA	NA	NA	3.4 U
Endrin aldehyde	NE	NA	NA	NA	NA	3.4 U
Endrin ketone	NE	NA	NA	NA	NA	3.4 U
gamma-Chlordane	540	NA	NA	NA	NA	1.7 U
Heptachlor	100	NA	NA	NA	NA	1.7 U
Heptachlor epoxide	20	NA	NA	NA	NA	1.7 U
Lindane	NE	NA	NA	NA	NA	1.7 U
Methoxychlor	NE	NA	NA	NA	NA	17 U
Toxaphene	NE	NA	NA	NA	NA	170 U

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		MW-03	RPMW-14D2	RPMW-15D		RPSB-128
		10.50 RB-112098-B21 11/20/1998	10-14 RPMW-14D2 (10-14) 08/19/2002	9-9.5 RPMW-15D (9-9.5) 08/20/2002	9.5-10 RPMW-15D (9.5-10) 08/20/2002	1-4 RPSB-128 (1-4) 08/19/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	**20**	2.1 U	1.4 U	2.3 U	**36**
Toluene	1.5	**78**	**110**	**96**	**91**	**55**
Ethyl benzene	5.5	**130**	2.1 U	**7.4**	5.5	**460**
Xylene (total)	1.2	**870 D**	**190**	**210**	**390**	**520**
Total BTEX		1098	300	313.4	486.5	1071
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	1500 U	NA	NA	NA	NA
2-Hexanone	NE	1500 U	NA	NA	NA	NA
Acetone	200	1500 U	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	1500 U	NA	NA	NA	NA
Chlorobenzene	1700	1500 U	NA	NA	NA	NA
Methylene chloride	100	1500 U	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	100000 D	NA	NA	NA	NA
Tetrachloroethene	1700	1500 U	NA	NA	NA	NA
Trichloroethene	700	1500 U	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	NA	7.5 U	**0.75 J**	**0.44 J**	**3.3 J**
Benzo(a)pyrene	0.061	NA	7.5 U	3.9 U	3.1 U	**2 J**
Benzo(b)fluoranthene	1.1	NA	7.5 U	0.62 J	0.34 J	**2.3 J**
Benzo(k)fluoranthene	1.1	NA	7.5 U	3.9 U	3.1 U	19 U
Chrysene	0.4	NA	**0.76 J**	**0.84 J**	**0.48 J**	**3.4 J**
Dibenzo(a,h)anthracene	0.014	NA	7.5 U	3.9 U	3.1 U	19 U
Indeno(1,2,3-cd)pyrene	3.2	NA	7.5 U	3.9 U	3.1 U	19 U
Total Carcinogenic PAHs		NA	0.76	2.21	1.26	11
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	NA	28	17	11	**87**
Acenaphthene	50	NA	7.5 U	0.52 J	3.1 U	19 U
Acenaphthylene	41	NA	7.5 U	0.98 J	0.61 J	7.4 J
Anthracene	50	NA	1.3 J	0.86 J	0.38 J	4.2 J
Benzo(g,h,i)perylene	50	NA	7.5 U	3.9 U	3.1 U	19 U
Fluoranthene	50	NA	1.5 J	1.8 J	1.1 J	7.8 J
Fluorene	50	NA	4.8 J	2.6 J	1.2 J	9.9 J
Naphthalene	13	NA	**78**	**53**	**38**	**290**
Phenanthrene	50	NA	9	5.9	3.6	24
Pyrene	50	NA	2.1 J	2.4 J	1.4 J	10 J
Total Non-Carcinogenic PAHs		NA	124.7	85.06	57.29	440.3
Total PAHs		NA	125.46	87.27	58.55	451.3
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	1600 J	500 J	3100 U	19000 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		MW-03	RPMW-14D2	RPMW-15D		RPSB-128
		10.50 RB-112098-B21 11/20/1998	10-14 RPMW-14D2 (10-14) 08/19/2002	9-9.5 RPMW-15D (9-9.5) 08/20/2002	9.5-10 RPMW-15D (9.5-10) 08/20/2002	1-4 RPSB-128 (1-4) 08/19/2002
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	NA	0.28 UJ	0.28 U	0.27 UJ	0.43 UJ
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-128	RPSB-128A	RPSB-20	RPSB-25	
		10-17	9-10.5	2-4	4-6	6-8
		RPSB-128 (10-17)	RPSB-128A (9-10.5)	RPSB-20 (2-4)	RPSB-25 (4-6)	RPSB-25 (6-8)
		08/19/2002	07/26/2002	12/20/1999	12/21/1999	12/21/1999
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	**0.07**	5.7 UJ	**3**	**1.4**	0.3 U
Toluene	1.5	0.015 JD	**460 J**	**6.2**	**37 D**	**21**
Ethyl benzene	5.5	0.13 JD	**35 J**	**31**	1	0.3 U
Xylene (total)	1.2	0.057 JD	**1300 J**	**96**	**15 D**	**9.1**
Total BTEX		0.272	1795	136.2	54.4	30.1
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	47 U	NA
2-Butanone	300	NA	NA	NA	47 U	NA
2-Hexanone	NE	NA	NA	NA	47 U	NA
Acetone	200	NA	NA	NA	180 B	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	20000 E	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	5000 E	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	6800 E	NA
Carbon disulfide	2700	NA	NA	NA	16 J	NA
Chlorobenzene	1700	NA	NA	NA	47 U	NA
Methylene chloride	100	NA	NA	NA	21 J	NA
n-Butylbenzene	NE	NA	NA	NA	47 U	NA
n-Propylbenzene	NE	NA	NA	NA	47 U	NA
sec-Butylbenzene	NE	NA	NA	NA	1700	NA
Styrene	NE	NA	NA	NA	47 U	NA
Tetrachloroethene	1700	NA	NA	NA	47 U	NA
Trichloroethene	700	NA	NA	NA	47 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	47 U	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.41 U	**7.3 D**	**600 J**	**2.4**	**2.1 J**
Benzo(a)pyrene	0.061	0.41 U	**4.7 J**	**170 J**	**1.6**	**1.6 J**
Benzo(b)fluoranthene	1.1	0.41 U	**5.2 J**	**410 J**	**1.8**	**1.7 J**
Benzo(k)fluoranthene	1.1	0.41 U	**1.9 J**	**170 J**	0.68	**1.1 J**
Chrysene	0.4	0.41 U	**7.1 D**	**620 J**	**2.1**	**1.9 J**
Dibenzo(a,h)anthracene	0.014	0.41 U	**0.5 J**	**44 J**	**0.31 J**	3.1 U
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	1.9 J	**190 J**	1.1	0.51 J
Total Carcinogenic PAHs		0	28.6	2204	9.99	8.91
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.41 U	**74 D**	**2100 D**	30 D	**40**
Acenaphthene	50	0.41 U	4 J	**150**	2.8	5.1
Acenaphthylene	41	0.41 U	16 JD	**390 J**	0.41 U	3.1 U
Anthracene	50	0.41 U	8.8 JD	**300 J**	3.1	3.7
Benzo(g,h,i)perylene	50	0.41 U	2.2 J	**190 J**	1.2	0.6 J
Fluoranthene	50	0.41 U	14 JD	**1200**	3.2	3.5
Fluorene	50	0.41 U	15 JD	**750 J**	7 D	7.8
Naphthalene	13	0.065 J	**220 D**	**1900 D**	**35 D**	**46**
Phenanthrene	50	0.41 U	42 D	**4200 D**	18 D	19
Pyrene	50	0.41 U	26 JD	**2300 D**	5.7	7.2
Total Non-Carcinogenic PAHs		0.065	422	13480	106	132.9
Total PAHs		0.065	450.6	15684	115.99	141.81
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	47 U	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	410 U	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	410 U	NA
2-Methylphenol	100	NA	NA	NA	410 U	NA
4-Methylphenol	900	NA	NA	NA	410 U	NA
Benzene, hydroxy-	NE	NA	NA	15000 U	410 U	15000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	410 U	NA
Butylbenzylphthalate	50000	NA	NA	NA	410 U	NA
Carbazole	NE	NA	NA	NA	410 U	NA
Dibenzofuran	6200	410 U	2200 J	**95000 J**	410 U	2700 J
Di-n-butylphthalate	8100	NA	NA	NA	410 U	NA
Di-n-octylphthalate	50000	NA	NA	NA	410 U	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	410 U	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-128	RPSB-128A	RPSB-20	RPSB-25	
		10-17 RPSB-128 (10-17) 08/19/2002	9-10.5 RPSB-128A (9-10.5) 07/26/2002	2-4 RPSB-20 (2-4) 12/20/1999	4-6 RPSB-25 (4-6) 12/21/1999	6-8 RPSB-25 (6-8) 12/21/1999
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	700	NA
Antimony	NE*	NA	NA	NA	0.25 U	NA
Arsenic	7.5	NA	NA	4	3.5	1.9
Barium	300	NA	NA	72.6	41.7	19.6 B
Beryllium	0.16	NA	NA	NA	0.25 U	NA
Cadmium	1	NA	NA	0.47 B	0.35 B	0.24 B
Calcium	NE*	NA	NA	NA	252	NA
Chromium	10	NA	NA	6.8	6.1	3.6
Cobalt	30	NA	NA	NA	1 B	NA
Copper	25	NA	NA	NA	37.4	NA
Iron	2000	NA	NA	NA	4570	NA
Lead	NE*	NA	NA	32.9	153	103
Magnesium	NE*	NA	NA	NA	210	NA
Manganese	NE*	NA	NA	NA	12	NA
Mercury	0.1	NA	NA	0.02 U	0.021 U	0.038 B
Nickel	13	NA	NA	NA	4.1 B	NA
Potassium	NE*	NA	NA	NA	247	NA
Selenium	2	NA	NA	**2.7 B**	**4.3**	**3.3**
Silver	NE*	NA	NA	0.43 B	0.52 B	0.34 B
Sodium	NE*	NA	NA	NA	18.6 U	NA
Thallium	NE*	NA	NA	NA	0.37 U	NA
Vanadium	150	NA	NA	NA	6.7	NA
Zinc	20	NA	NA	NA	**25.1**	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.28 UJ	0.29 UJ	1.5	2.6	1.3
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	41 U	NA
Aroclor 1254	1000/10000	NA	NA	NA	41 U	NA
Aroclor 1260	1000/10000	NA	NA	NA	47	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	4.1 U	NA
4,4'-DDE	2100	NA	NA	NA	8.8	NA
4,4'-DDT	2100	NA	NA	NA	7.1	NA
Aldrin	41	NA	NA	NA	12	NA
alpha-BHC	110	NA	NA	NA	2.1 U	NA
alpha-Chlordane	NE	NA	NA	NA	2.1 U	NA
beta-BHC	200	NA	NA	NA	2.1 U	NA
delta-BHC	300	NA	NA	NA	2.1 U	NA
Dieldrin	44	NA	NA	NA	4.1 U	NA
Endosulfan I	900	NA	NA	NA	2.1 U	NA
Endosulfan II	900	NA	NA	NA	4.1 U	NA
Endosulfan sulfate	1000	NA	NA	NA	18	NA
Endrin	100	NA	NA	NA	4.1 U	NA
Endrin aldehyde	NE	NA	NA	NA	13	NA
Endrin ketone	NE	NA	NA	NA	4.1 U	NA
gamma-Chlordane	540	NA	NA	NA	11	NA
Heptachlor	100	NA	NA	NA	2.1 U	NA
Heptachlor epoxide	20	NA	NA	NA	2.1 U	NA
Lindane	NE	NA	NA	NA	2.1 U	NA
Methoxychlor	NE	NA	NA	NA	21 U	NA
Toxaphene	NE	NA	NA	NA	210 U	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-26	RPSB-32	RPSB-33	RPSB-39	RPSB-47
		4-6	2-4	2-4	2-4	5-7
		RPSB-26 (4-6)	RPSB-32 (2-4)	RPSB-33 (2-4)	RPSB-39 (2-4)	RPSB-47 (5-7)
		01/19/2000	12/21/1999	12/22/1999	02/01/2000	01/13/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 J	0.002	0.022	12 U	0.27 U
Toluene	1.5	0.005 U	0.004	0.007	**74**	0.27 U
Ethyl benzene	5.5	0.001 J	0.006	0.065	**380**	0.27 U
Xylene (total)	1.2	0.005 U	0.011	0.038	**1200**	**7.8**
Total BTEX		0.002	0.023	0.132	1654	7.8
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	5 U	NA	5 U	NA	NA
2-Butanone	300	5 U	NA	3 J	NA	NA
2-Hexanone	NE	5 U	NA	5 U	NA	NA
Acetone	200	4 J	NA	18	NA	NA
Benzene, 1,2,4-trimethyl	NE	5 U	NA	6	NA	NA
Benzene, 1,3,5-trimethyl-	NE	5 U	NA	2 J	NA	NA
Benzene, 1-methylethyl-	NE	5 U	NA	5 U	NA	NA
Carbon disulfide	2700	2 J	NA	5 U	NA	NA
Chlorobenzene	1700	5 U	NA	5 U	NA	NA
Methylene chloride	100	22	NA	39	NA	NA
n-Butylbenzene	NE	5 U	NA	5 U	NA	NA
n-Propylbenzene	NE	5 U	NA	5 U	NA	NA
sec-Butylbenzene	NE	5 U	NA	5 U	NA	NA
Styrene	NE	5 U	NA	8	NA	NA
Tetrachloroethene	1700	5 U	NA	1 J	NA	NA
Trichloroethene	700	5 U	NA	5 U	NA	NA
Trichlorofluoromethane	NE	5 U	NA	5 U	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.13 J	**3.2**	**2.2**	**4.6 J**	**9.6**
Benzo(a)pyrene	0.061	**0.082 J**	**1.9**	**1.1**	**2.4 J**	**8.1**
Benzo(b)fluoranthene	1.1	0.16 J	**4**	**1.7**	**4.2 J**	**7.8**
Benzo(k)fluoranthene	1.1	0.076 J	**1.6**	**0.54**	**1.9 J**	**2.6 J**
Chrysene	0.4	0.16 J	**3.4**	**2.4**	**5.6 J**	**9.5**
Dibenzo(a,h)anthracene	0.014	0.34 U	**0.44 J**	**0.28 J**	8.1 U	3.5 U
Indeno(1,2,3-cd)pyrene	3.2	0.088 J	2.3	1.2	2 J	2.8 J
Total Carcinogenic PAHs		0.696	16.84	9.42	20.7	40.4
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.34 U	0.22 J	2.4	**68**	13
Acenaphthene	50	0.34 U	0.21 J	0.18 J	1.6 J	3.8
Acenaphthylene	41	0.075 J	1.5	1.5	6.2 J	4.9
Anthracene	50	0.039 J	0.7	2	3.5 J	6.6
Benzo(g,h,i)perylene	50	0.1 J	2.6	1.4	2.3 J	3.5 J
Fluoranthene	50	0.2 J	3.5	4.1	8.7	16
Fluorene	50	0.34 U	0.57 J	1.1	5.4 J	8.3
Naphthalene	13	0.046 J	0.31 J	4.7	**320 D**	4.7
Phenanthrene	50	0.15 J	6.7	5.8	16	20
Pyrene	50	0.32 J	11	6.7 D	14	48
Total Non-Carcinogenic PAHs		0.93	27.31	29.88	445.7	128.8
Total PAHs		1.626	44.15	39.3	466.4	169.2
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	5 U	NA	5 U	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	340 U	NA	370 U	NA	NA
2,4-Dinitrotoluene	NE	340 U	NA	370 U	NA	NA
2-Methylphenol	100	340 U	NA	38 J	NA	NA
4-Methylphenol	900	340 U	NA	48 J	NA	NA
Benzene, hydroxy-	NE	340 U	15000 U	40 J	12000 U	13000 U
Bis(2-ethylhexyl)phthalate	50000	520	NA	370 U	NA	NA
Butylbenzylphthalate	50000	340 U	NA	370 U	NA	NA
Carbazole	NE	340 U	NA	69 J	NA	NA
Dibenzofuran	6200	340 U	690 U	120 J	1400 J	720 J
Di-n-butylphthalate	8100	340 U	NA	370 U	NA	NA
Di-n-octylphthalate	50000	340 U	NA	370 U	NA	NA
N-Nitrosodiphenylamine (1)	NE	340 U	NA	370 U	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-26	RPSB-32	RPSB-33	RPSB-39	RPSB-47
		4-6 RPSB-26 (4-6) 01/19/2000	2-4 RPSB-32 (2-4) 12/21/1999	2-4 RPSB-33 (2-4) 12/22/1999	2-4 RPSB-39 (2-4) 02/01/2000	5-7 RPSB-47 (5-7) 01/13/2000
Metals (mg/kg)						
Aluminum	NE*	802	NA	936	NA	NA
Antimony	NE*	0.24 B	NA	0.17 U	NA	NA
Arsenic	7.5	1.2	1.6	0.61 B	1 B	0.23 U
Barium	300	6.5 B	23.4	51.9	7.6 B	6.1 B
Beryllium	0.16	0.2 U	NA	0.17 U	NA	NA
Cadmium	1	0.36 B	0.31 B	**1.3**	0.19 U	0.15 U
Calcium	NE*	958	NA	280	NA	NA
Chromium	10	5.7	3.5	**17.3**	**20.7**	2.8
Cobalt	30	7.2	NA	3.3 B	NA	NA
Copper	25	6.4	NA	21.5	NA	NA
Iron	2000	**2510**	NA	**16800**	NA	NA
Lead	NE*	5.5	91.9	26.7	322	11.5
Magnesium	NE*	299	NA	103	NA	NA
Manganese	NE*	49	NA	13.5	NA	NA
Mercury	0.1	0.017 U	0.059	0.017 B	0.032 B	0.032 B
Nickel	13	**17.8**	NA	10	NA	NA
Potassium	NE*	177 B	NA	229	NA	NA
Selenium	2	0.46 B	**4**	**16.5**	0.38 U	0.36 B
Silver	NE*	0.97 B	0.34 B	1.7 B	0.28 U	0.23 U
Sodium	NE*	27.8 B	NA	13.1 U	NA	NA
Thallium	NE*	0.3 U	NA	0.26 U	NA	NA
Vanadium	150	3.6 B	NA	32.1	NA	NA
Zinc	20	**112**	NA	10	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.9	8	2.8	2.1	0.56 B
PCBs (ug/kg)						
Aroclor 1242	1000/10000	34 U	NA	37 U	NA	NA
Aroclor 1254	1000/10000	34 U	NA	37 U	NA	NA
Aroclor 1260	1000/10000	34 U	NA	37 U	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	3.4 U	NA	3.6 U	NA	NA
4,4'-DDE	2100	3.4 U	NA	3.6 U	NA	NA
4,4'-DDT	2100	3.4 U	NA	3.6 U	NA	NA
Aldrin	41	1.7 U	NA	1.9 U	NA	NA
alpha-BHC	110	1.7 U	NA	1.9 U	NA	NA
alpha-Chlordane	NE	1.7 U	NA	1.9 U	NA	NA
beta-BHC	200	1.7 U	NA	1.9 U	NA	NA
delta-BHC	300	1.7 U	NA	1.9 U	NA	NA
Dieldrin	44	3.4 U	NA	3.6 U	NA	NA
Endosulfan I	900	1.7 U	NA	1.9 U	NA	NA
Endosulfan II	900	5.3	NA	3.6 U	NA	NA
Endosulfan sulfate	1000	8.2	NA	3.6 U	NA	NA
Endrin	100	35	NA	3.6 U	NA	NA
Endrin aldehyde	NE	3.4 U	NA	3.6 U	NA	NA
Endrin ketone	NE	3.4 U	NA	3.6 U	NA	NA
gamma-Chlordane	540	1.7 U	NA	1.9 U	NA	NA
Heptachlor	100	1.7 U	NA	1.9 U	NA	NA
Heptachlor epoxide	20	1.7 U	NA	3.2	NA	NA
Lindane	NE	1.7 U	NA	1.9 U	NA	NA
Methoxychlor	NE	17 U	NA	19 U	NA	NA
Toxaphene	NE	170 U	NA	190 U	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-48	RPSB-52	RPSB-53	RPSB-54
		4-6	6-8	5-7	4-6
		RPSB-48 (4-6)	RPSB-52 (6-8)	RPSB-53 (5-7)	RPSB-54 (4-6)
		01/19/2000	01/13/2000	02/02/2000	01/12/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	**120**	6.2 U	0.06 U	0.001 U
Toluene	1.5	**71**	**84**	0.75	0.002
Ethyl benzene	5.5	**770**	**7.3**	0.098	0.004
Xylene (total)	1.2	**680**	**250**	**1.4**	0.004
Total BTEX		1641	341.3	2.248	0.01
Other Volatile Organic Compounds (ug/kg)					
1,2,3-Trichlorobenzene	NE	30000 U	NA	NA	NA
2-Butanone	300	30000 U	NA	NA	NA
2-Hexanone	NE	30000 U	NA	NA	NA
Acetone	200	30000 U	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	120000	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	48000	NA	NA	NA
Benzene, 1-methylethyl-	NE	30000 U	NA	NA	NA
Carbon disulfide	2700	30000 U	NA	NA	NA
Chlorobenzene	1700	30000 U	NA	NA	NA
Methylene chloride	100	30000 U	NA	NA	NA
n-Butylbenzene	NE	30000 U	NA	NA	NA
n-Propylbenzene	NE	6800 J	NA	NA	NA
sec-Butylbenzene	NE	30000 U	NA	NA	NA
Styrene	NE	440000	NA	NA	NA
Tetrachloroethene	1700	30000 U	NA	NA	NA
Trichloroethene	700	30000 U	NA	NA	NA
Trichlorofluoromethane	NE	30000 U	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	16 U	**1.6 J**	**0.43**	**1.6**
Benzo(a)pyrene	0.061	16 U	**1 J**	**0.23 J**	**0.69**
Benzo(b)fluoranthene	1.1	16 U	**1.4 J**	0.36 J	**1.2**
Benzo(k)fluoranthene	1.1	16 U	4.1 U	0.13 J	0.64
Chrysene	0.4	16 U	**1.7 J**	**0.48**	**1.7**
Dibenzo(a,h)anthracene	0.014	16 U	4.1 U	0.4 U	**0.24 J**
Indeno(1,2,3-cd)pyrene	3.2	16 U	0.59 J	0.2 J	0.71
Total Carcinogenic PAHs		0	6.29	1.83	6.78
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	**41**	**56**	0.35 J	0.13 J
Acenaphthene	50	16 U	4.1 U	0.37 J	0.33 U
Acenaphthylene	41	16 U	3 J	0.4 U	1.2
Anthracene	50	16 U	1.9 J	0.42	1
Benzo(g,h,i)perylene	50	16 U	0.66 J	0.27 J	0.77
Fluoranthene	50	16 U	3.1 J	1	1.1
Fluorene	50	1.9 J	4 J	1.2	0.26 J
Naphthalene	13	**330**	**390 D**	0.83	0.32 J
Phenanthrene	50	5.4 J	11	3.2	0.72
Pyrene	50	2.2 J	4.9	1.4	3
Total Non-Carcinogenic PAHs		380.5	474.56	9.04	8.5
Total PAHs		380.5	480.85	10.87	15.28
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	30000 U	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	16000 U	NA	NA	NA
2,4-Dinitrotoluene	NE	16000 U	NA	NA	NA
2-Methylphenol	100	16000 U	NA	NA	NA
4-Methylphenol	900	16000 U	NA	NA	NA
Benzene, hydroxy-	NE	16000 U	12000 U	13000 U	12000 U
Bis(2-ethylhexyl)phthalate	50000	16000 U	NA	NA	NA
Butylbenzylphthalate	50000	16000 U	NA	NA	NA
Carbazole	NE	16000 U	NA	NA	NA
Dibenzofuran	6200	16000 U	1000 J	220 J	330 U
Di-n-butylphthalate	8100	16000 U	NA	NA	NA
Di-n-octylphthalate	50000	16000 U	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	16000 U	NA	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-48	RPSB-52	RPSB-53	RPSB-54
		4-6	6-8	5-7	4-6
		RPSB-48 (4-6)	RPSB-52 (6-8)	RPSB-53 (5-7)	RPSB-54 (4-6)
		01/19/2000	01/13/2000	02/02/2000	01/12/2000
Metals (mg/kg)					
Aluminum	NE*	318	NA	NA	NA
Antimony	NE*	0.41 B	NA	NA	NA
Arsenic	7.5	0.88 B	0.79 B	0.45 B	1.5
Barium	300	4.6 B	6.5 B*	8.3 B	8.8 B*
Beryllium	0.16	0.21 U	NA	NA	NA
Cadmium	1	0.21 U	0.44 B	0.071 B	**1.3**
Calcium	NE*	880	NA	NA	NA
Chromium	10	3.5	4.5	3.5	6.2
Cobalt	30	0.59 B	NA	NA	NA
Copper	25	2.4 B	NA	NA	NA
Iron	2000	1050	NA	NA	NA
Lead	NE*	20.2	22.2 *	10.2 *	28.8 *
Magnesium	NE*	131	NA	NA	NA
Manganese	NE*	10	NA	NA	NA
Mercury	0.1	0.019 U	0.017 U	0.018 B	0.017 U
Nickel	13	0.9 B	NA	NA	NA
Potassium	NE*	89.4 B	NA	NA	NA
Selenium	2	0.42 U	0.43 U	0.43 U	**2.4**
Silver	NE*	0.32 U	0.32 U	0.48 B	0.54 B
Sodium	NE*	15.8 U	NA	NA	NA
Thallium	NE*	0.32 U	NA	NA	NA
Vanadium	150	1.4 B	NA	NA	NA
Zinc	20	9.9	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.29 B	0.85	0.26 B	5.2
PCBs (ug/kg)					
Aroclor 1242	1000/10000	41 U	NA	NA	NA
Aroclor 1254	1000/10000	41 U	NA	NA	NA
Aroclor 1260	1000/10000	41 U	NA	NA	NA
Pesticides (ug/kg)					
4,4'-DDD	2900	5.9	NA	NA	NA
4,4'-DDE	2100	4.0 U	NA	NA	NA
4,4'-DDT	2100	8.8	NA	NA	NA
Aldrin	41	2.1 U	NA	NA	NA
alpha-BHC	110	2.1 U	NA	NA	NA
alpha-Chlordane	NE	2.1 U	NA	NA	NA
beta-BHC	200	2.1 U	NA	NA	NA
delta-BHC	300	5.5	NA	NA	NA
Dieldrin	44	4.0 U	NA	NA	NA
Endosulfan I	900	6.2	NA	NA	NA
Endosulfan II	900	4.0 U	NA	NA	NA
Endosulfan sulfate	1000	9.9	NA	NA	NA
Endrin	100	4.0 U	NA	NA	NA
Endrin aldehyde	NE	4 U	NA	NA	NA
Endrin ketone	NE	4 U	NA	NA	NA
gamma-Chlordane	540	3.2	NA	NA	NA
Heptachlor	100	2.1 U	NA	NA	NA
Heptachlor epoxide	20	4.1	NA	NA	NA
Lindane	NE	2.1 U	NA	NA	NA
Methoxychlor	NE	21 U	NA	NA	NA
Toxaphene	NE	210 U	NA	NA	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-97	TP-02B	TP-03B	TP-04B
		5-7	2-2.5	8-9	8.5-9
		RPSB-97 (5-7)	RPTP-2 (2-2.5)	RPTP3 (8-9)	RPTP-4 (8.5-9.0)
		11/26/2001	10/24/1995	10/25/1995	10/26/1995
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.6 U	**0.95**	10 U	**1.73**
Toluene	1.5	**59**	2.07	3.47	**59.6**
Ethyl benzene	5.5	**110 D**	**3.79**	10 U	**6.02**
Xylene (total)	1.2	**320 D**	NA	**310**	NA
Total BTEX		489	6.8	313.47	67.35
Other Volatile Organic Compounds (ug/kg)					
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA
2-Butanone	300	NA	NA	30000 U	NA
2-Hexanone	NE	NA	NA	30000 U	NA
Acetone	200	NA	NA	13000 J	NA
Benzene, 1,2,4-trimethyl	NE	NA	210 U	41100	28500
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	10000 U	NA
Chlorobenzene	1700	NA	NA	10000 U	NA
Methylene chloride	100	NA	NA	10000 U	NA
n-Butylbenzene	NE	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA
Styrene	NE	NA	48200	3720	150 U
Tetrachloroethene	1700	NA	NA	10000 U	NA
Trichloroethene	700	NA	NA	10000 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**1.2**	**5**	**1.13**	**3.5**
Benzo(a)pyrene	0.061	**0.49**	**1.99**	**0.73**	**3.1**
Benzo(b)fluoranthene	1.1	**1.6**	**5.09**	7.4 U	**3**
Benzo(k)fluoranthene	1.1	0.62	**3.91**	0.47	**2.46**
Chrysene	0.4	**1.7**	**5.2**	**1.3 JD**	**4.48**
Dibenzo(a,h)anthracene	0.014	**0.23 J**	**0.98**	7.4 U	**0.82**
Indeno(1,2,3-cd)pyrene	3.2	0.67	2.93	7.4 U	2.60
Total Carcinogenic PAHs		6.51	25.1	3.63	19.96
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	13 D	0.21 U	**52.4**	29.5
Acenaphthene	50	0.53	0.21 U	0.20 U	9.01
Acenaphthylene	41	1.6	5.03	14.8	32.3
Anthracene	50	0.94	0.83	10.2	0.51
Benzo(g,h,i)perylene	50	0.67	3.53	0.42	5.14 J
Fluoranthene	50	2.7	0.57	3.2 JD	3.43
Fluorene	50	2.2	0.21 U	4.2 JD	6.49
Naphthalene	13	**37 D**	3.44	**93 D**	**45.6**
Phenanthrene	50	9.3 D	0.71	11 D	7.44
Pyrene	50	4.4	1.49	3.7 JD	12.6
Total Non-Carcinogenic PAHs		72.34	15.6	192.92	152.02
Total PAHs		78.85	40.7	196.55	171.98
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	7400 U	NA
1-Methyl naphthalene	NE	NA	0.46	19.4	12.2
2,4-Dimethylphenol	NE	NA	NA	7400 U	NA
2,4-Dinitrotoluene	NE	NA	NA	7400 U	NA
2-Methylphenol	100	NA	NA	7400 U	NA
4-Methylphenol	900	NA	NA	7400 U	NA
Benzene, hydroxy-	NE	NA	NA	7400 U	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	7400 U	NA
Butylbenzylphthalate	50000	NA	NA	7400 U	NA
Carbazole	NE	NA	NA	7400 U	NA
Dibenzofuran	6200	450	210 U	2630	1920
Di-n-butylphthalate	8100	NA	NA	7400 U	NA
Di-n-octylphthalate	50000	NA	NA	7400 U	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	7400 U	NA

Table 4-11 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-97	TP-02B	TP-03B	TP-04B
		5-7	2-2.5	8-9	8.5-9
		RPSB-97 (5-7)	RPTP-2 (2-2.5)	RPTP3 (8-9)	RPTP-4 (8.5-9.0)
		11/26/2001	10/24/1995	10/25/1995	10/26/1995
Metals (mg/kg)					
Aluminum	NE*	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	1.2 B	NA	NA	NA
PCBs (ug/kg)					
Aroclor 1242	1000/10000	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA
Pesticides (ug/kg)					
4,4'-DDD	2900	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-12
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		B-11	B-19	B-23	MW-02	RPSB-128A
		14.00	23.50	12.00	13.00	215-22.5
		RB-112398-B11	RB-111998-B19	RB-112398-B23	RB-112098-B3	RPSB-128A (21.5-22.5)
		11/23/1998	11/18/1998	11/23/1998	11/20/1998	07/26/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.0059 U	0.0008 J	**2.8 D**	**0.065**	0.002 UJ
Ethyl benzene	5.5	0.014	0.0012	**9.8 D**	0.019	0.028 J
Toluene	1.5	0.0084	0.0008 J	**20 D**	0.079	0.026 J
Xylene (total)	1.2	0.026	0.005	**60 D**	0.067	0.068 J
Total BTEX		0.0484	0.0078	92.6	0.23	0.122
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	2.4 U	0.41 U	**3.4**	0.4 U	0.41 U
Benzo(a)pyrene	0.061	2.4 U	0.41 U	**2.4 J**	0.4 U	0.41 U
Benzo(b)fluoranthene	1.1	2.4 U	0.41 U	**1.8 J**	0.4 U	0.41 U
Benzo(k)fluoranthene	1.1	2.4 U	0.41 U	0.51 J	0.4 U	0.41 U
Chrysene	0.4	2.4 U	0.41 U	**2.9**	0.4 U	0.41 U
Dibenzo(a,h)anthracene	0.014	2.4 U	0.41 U	2.4 U	0.4 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	2.4 U	0.41 U	0.94 J	0.4 U	0.41 U
Total Carcinogenic PAHs		0	0	11.95	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	2.4 U	0.41 U	11	0.098 J	0.41 U
Acenaphthene	50	2.4 U	0.41 U	5.6	0.4 U	0.41 U
Acenaphthylene	41	2.4 U	0.41 U	1.4 J	0.4 U	0.41 U
Anthracene	50	2.4 U	0.41 U	4.8	0.4 U	0.41 U
Benzo(g,h,i)perylene	50	2.4 U	0.41 U	0.94 J	0.4 U	0.41 U
Fluoranthene	50	2.4 U	0.41 U	6.3	0.4 U	0.41 U
Fluorene	50	2.4 U	0.41 U	4.5	0.4 U	0.41 U
Naphthalene	13	2.4 U	0.41 U	**49 D**	0.82	0.41 U
Phenanthrene	50	2.4 U	0.41 U	17	0.4 U	0.41 U
Pyrene	50	2.4 U	0.41 U	13	0.045 J	0.41 U
Total Non-Carcinogenic PAHs		0	0	113.54	0.963	0
Total PAHs		0	0	125.49	0.963	0
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA	410 U
Metals (mg/kg)						
Arsenic	7.5	0.4 U	0.8 U	0.4 U	0.4 U	NA
Barium	300	1.7 B	2.5 B	2.3 B	1.9 B	NA
Cadmium	1	0.07 U	0.07 U	0.07 U	0.07 U	NA
Chromium	10	1.5 B	2.6	2 B	2.1 B	NA
Lead	NE*	2.3	1	0.8	1.5	NA
Mercury	0.1	0.1 U	0.12 U	0.1 U	0.12 U	NA
Selenium	2	0.8 U	0.8 U	0.8 U	0.8 U	NA
Silver	NE*	0.3 U	0.3 U	0.3 U	0.3 U	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	1.2 U	1.2 U	35.8	1.2 U	0.25 UJ

Table 4-12 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-26	RPSB-33	RPSB-40	RPSB-48	RPSB-54
		13-15	15-17	19-21	22-24	12-14
		RPSB-26 (13-15)	RPSB-33 (15-17)	RPSB-40 (19-21)	RPSB-48 (22-24)	RPSB-54 (12-14)
		01/19/2000	12/22/1999	01/20/2000	01/24/2000	01/12/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	**2.3**	0.061 U	0.005	0.001 U	1.2 U
Ethyl benzene	5.5	0.48	0.54	0.002	0.001 U	5
Toluene	1.5	**2.7**	0.58	0.004	0.003	**33**
Xylene (total)	1.2	1	**1.6**	0.003	0.002	**23**
Total BTEX		6.48	2.72	0.014	0.005	61
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	4.1 U	0.18 J	0.4 U	0.4 U	0.4 U
Benzo(a)pyrene	0.061	4.1 U	**0.1 J**	0.4 U	0.4 U	0.4 U
Benzo(b)fluoranthene	1.1	4.1 U	0.12 J	0.4 U	0.4 U	0.4 U
Benzo(k)fluoranthene	1.1	4.1 U	0.039 J	0.4 U	0.4 U	0.4 U
Chrysene	0.4	4.1 U	0.18 J	0.4 U	0.4 U	0.4 U
Dibenzo(a,h)anthracene	0.014	4.1 U	0.39 U	0.4 U	0.4 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	4.1 U	0.39 U	0.4 U	0.4 U	0.4 U
Total Carcinogenic PAHs		0	0.619	0	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	4.1 U	0.33 J	0.4 U	0.4 U	0.4 U
Acenaphthene	50	4.1 U	0.39 U	0.4 U	0.4 U	0.4 U
Acenaphthylene	41	4.1 U	0.05 J	0.4 U	0.4 U	0.4 U
Anthracene	50	4.1 U	0.18 J	0.4 U	0.4 U	0.4 U
Benzo(g,h,i)perylene	50	4.1 U	0.044 J	0.4 U	0.4 U	0.4 U
Fluoranthene	50	4.1 U	0.34 J	0.4 U	0.4 U	0.4 U
Fluorene	50	4.1 U	0.22 J	0.4 U	0.4 U	0.4 U
Naphthalene	13	4.8	1.2	0.4 U	0.4 U	0.07 J
Phenanthrene	50	4.1 U	0.92	0.4 U	0.4 U	0.4 U
Pyrene	50	4.1 U	0.58	0.4 U	0.4 U	0.4 U
Total Non-Carcinogenic PAHs		4.8	3.864	0	0	0.07
Total PAHs		4.8	4.483	0	0	0.07
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	12000 U	12000 U	12000 U	13000 U	12000 U
Dibenzofuran	6200	4100 U	390 U	400 U	400 U	400 U
Metals (mg/kg)						
Arsenic	7.5	0.8 B	0.47 B	0.74 B	0.31 U	0.25 B
Barium	300	2.3 B	1.9 B	1.7 B	1.3 B	0.96 B*
Cadmium	1	0.19 U	0.17 U	0.22 U	0.21 U	0.14 U
Chromium	10	3.3	11.7	2.2	3.4	0.94 B
Lead	NE*	0.35 B	1.6	0.92 B	1.2	0.85 *
Mercury	0.1	0.02 U	0.017 U	0.017 U	0.018 U	0.019 U
Selenium	2	0.37 U	0.83 B	0.43 U	0.41 U	0.27 U
Silver	NE*	0.56 B	0.39 B	0.37 B	0.31 U	0.21 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.28 B	0.21 B	0.31 B	0.22 B	0.053 B

Table 4-12 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (12-24 feet)
Rockaway Park Former MGP Site

Notes:

* site background

NE - not established

NA - not analyzed

ND - indicates standard is applicable to analyte detection limit

J - estimated value

U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis

D - identifies all compounds in the analysis completed at secondary dilution factor

B - analyte was found within the laboratory method blank as well as the sample

N - spiked sample recovery was not within control limits (metals)

E - compound concentration exceeds the calibration range

P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.

Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.

TCLP - Toxicity Characteristic Leaching Procedure

mg/kg - milligrams/kilogram or parts per million (ppm)

ug/kg - micrograms/kilogram or parts per billion (ppb)

BTEX is benzene, toluene, ethylbenzene, and xylene.

PAHs are polycyclic aromatic hydrocarbons.

Table 4-13
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		B-05	RPSB-128A	RPSB-20	
		24.00	24-28	25-27	40-42
		RB-111898-B5	RPSB-128A (24-28)	RPSB-20 (25-27)	RPSB-20 (40-42)
		11/18/1998	07/26/2002	12/20/1999	12/20/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	**0.1**	0.001 UJ	0.001 U	0.001 U
Ethyl benzene	5.5	0.086	0.001 UJ	0.001 U	0.003
Toluene	1.5	0.052	0.001 UJ	0.001 U	0.001 U
Xylene (total)	1.2	0.069	0.004 J	0.001 U	0.003
Total BTEX		0.307	0.004	0	0.006
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.38 U	0.43 U	0.052 J	0.41 U
Benzo(a)pyrene	0.061	0.38 U	0.43 U	0.38 U	0.41 U
Benzo(b)fluoranthene	1.1	0.38 U	0.43 U	0.38 U	0.41 U
Benzo(k)fluoranthene	1.1	0.38 U	0.43 U	0.38 U	0.41 U
Chrysene	0.4	0.38 U	0.43 U	0.38 U	0.41 U
Dibenzo(a,h)anthracene	0.014	0.38 U	0.43 U	0.38 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.38 U	0.43 U	0.38 U	0.41 U
Total Carcinogenic PAHs		0	0	0.052	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.38 U	0.43 U	0.38 U	0.41 U
Acenaphthene	50	0.38 U	0.43 U	0.052 J	0.41 U
Acenaphthylene	41	0.38 U	0.43 U	0.18 J	0.41 U
Anthracene	50	0.38 U	0.43 U	0.11 J	0.41 U
Benzo(g,h,i)perylene	50	0.38 U	0.43 U	0.38 U	0.41 U
Fluoranthene	50	0.38 U	0.43 U	0.046 J	0.046 J
Fluorene	50	0.379 U	0.43 U	0.055 J	0.41 U
Naphthalene	13	0.053 J	0.43 U	0.38 U	0.41 U
Phenanthrene	50	0.38 U	0.43 U	0.12 J	0.11 J
Pyrene	50	0.38 U	0.43 U	0.12 J	0.095 J
Total Non-Carcinogenic PAHs		0.053	0	0.683	0.251
Total PAHs		0.053	0	0.735	0.251
Other Semivolatile Organic Compounds (ug/kg)					
Benzene, hydroxy-	NE	NA	NA	15000 U	15000 U
Dibenzofuran	6200	NA	430 U	380 U	410 U
Metals (mg/kg)					
Arsenic	7.5	0.3 B	NA	0.28 U	0.26 U
Barium	300	1.8 B	NA	1.2 B	1.8 B
Cadmium	1	0.2 B	NA	0.19 U	0.17 U
Chromium	10	2.84	NA	1 B	2.2
Lead	NE*	0.8	NA	0.55 B	0.47 B
Mercury	0.1	0.12 U	NA	0.019 U	0.021 U
Selenium	2	0.76 U	NA	0.37 U	0.35 U
Silver	NE*	0.3 U	NA	0.28 U	0.26 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	1.2 U	0.28 UJ	0.081 B	0.19 B

Table 4-13 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-25	RPSB-26	RPSB-32		RPSB-39
		40-42	38-40	25-27	40-42	25-27
		RPSB-25 (40-42)	RPSB-26 (38-40)	RPSB-32 (25-27)	RPSB-32 (40-42)	RPSB-39 (25-27)
		12/21/1999	01/19/2000	12/21/1999	12/21/1999	02/01/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.002	0.001 U	0.001 U	0.014
Ethyl benzene	5.5	0.001 U	0.002	0.003	0.001 U	0.001
Toluene	1.5	0.001 U	0.002	0.001 U	0.001 U	0.009
Xylene (total)	1.2	0.002	0.005	0.005	0.001 U	0.009
Total BTEX		0.002	0.011	0.008	0	0.033
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.39 U	3.9 U	0.14 J	0.41 U	0.4 U
Benzo(a)pyrene	0.061	0.39 U	3.9 U	**0.067 J**	0.41 U	0.4 U
Benzo(b)fluoranthene	1.1	0.39 U	3.9 U	0.052 J	0.41 U	0.4 U
Benzo(k)fluoranthene	1.1	0.39 U	3.9 U	0.051 J	0.41 U	0.4 U
Chrysene	0.4	0.39 U	3.9 U	0.16 J	0.41 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.39 U	3.9 U	0.37 U	0.41 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	3.9 U	0.37 U	0.41 U	0.4 U
Total Carcinogenic PAHs		0	0	0.47	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.39 U	3.9 U	0.37 U	0.41 U	0.055 J
Acenaphthene	50	0.39 U	3.9 U	0.11 J	0.41 U	0.4 U
Acenaphthylene	41	0.39 U	3.9 U	0.066 J	0.41 U	0.054 J
Anthracene	50	0.39 U	3.9 U	0.15 J	0.41 U	0.065 J
Benzo(g,h,i)perylene	50	0.39 U	3.9 U	0.37 U	0.41 U	0.4 U
Fluoranthene	50	0.39 U	3.9 U	0.29 J	0.065 J	0.076 J
Fluorene	50	0.39 U	3.9 U	0.21 J	0.41 U	0.098 J
Naphthalene	13	0.39 U	3.9 U	0.37 U	0.41 U	0.4 U
Phenanthrene	50	0.053 J	3.9 U	0.92	0.14 J	0.32 J
Pyrene	50	0.05 J	3.9 U	0.45	0.095 J	0.11 J
Total Non-Carcinogenic PAHs		0.103	0	2.196	0.3	0.778
Total PAHs		0.103	0	2.666	0.3	0.778
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	15000 U	12000 U	15000 U	15000 U	12000 U
Dibenzofuran	6200	390 U	3900 U	370 U	410 U	400 U
Metals (mg/kg)						
Arsenic	7.5	0.31 B	0.36 B	0.26 U	0.81 B	0.26 U
Barium	300	2.4 B	1.8 B	1.8 B	1.9 B	1.3 B
Cadmium	1	0.2 U	0.19 U	0.17 U	0.19 U	0.18 U
Chromium	10	1.4 B	1.7 B	2.5	1.5 B	2.6
Lead	NE*	0.59 B	0.81 B	0.71 B	0.89 B	1.1
Mercury	0.1	0.019 U	0.02 U	0.015 U	0.018 U	0.018 U
Selenium	2	0.39 U	0.39 U	0.34 U	0.37 U	0.35 U
Silver	NE*	0.29 U	0.35 B	0.26 U	0.28 U	0.26 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.093 B	0.18 B	0.047 U	0.12 B	0.12 B

Table 4-13 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-39	RPSB-40		RPSB-47	
		42-44	26-28	38-40	25-27	40-42
		RPSB-39 (42-44)	RPSB-40 (26-28)	RPSB-40 (38-40)	RPSB-47 (25-27)	RPSB-47 (40-42)
		02/01/2000	01/20/2000	01/20/2000	01/13/2000	01/14/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.004	0.001 U	0.002	0.001 U	0.001 U
Ethyl benzene	5.5	0.009	0.001 J	0.002	0.002	0.002
Toluene	1.5	0.046	0.002	0.001	0.001 J	0.001 U
Xylene (total)	1.2	0.1	0.001 U	0.003	0.004	0.002
Total BTEX		0.159	0.003	0.008	0.007	0.004
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.4 U	0.39 U	4 U	**1.5**	0.4 U
Benzo(a)pyrene	0.061	0.4 U	0.39 U	4 U	**1.1**	0.4 U
Benzo(b)fluoranthene	1.1	0.4 U	0.39 U	4 U	**1.1**	0.4 U
Benzo(k)fluoranthene	1.1	0.4 U	0.39 U	4 U	0.36 J	0.4 U
Chrysene	0.4	0.4 U	0.39 U	4 U	**1.5**	0.4 U
Dibenzo(a,h)anthracene	0.014	0.4 U	0.39 U	4 U	**0.12 J**	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	0.39 U	4 U	0.13 J	0.4 U
Total Carcinogenic PAHs		0	0	0	5.81	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.4 U	0.39 U	4 U	0.68 J	0.4 U
Acenaphthene	50	0.4 U	0.39 U	4 U	1.9	0.4 U
Acenaphthylene	41	0.4 U	0.39 U	4 U	0.51 J	0.4 U
Anthracene	50	0.4 U	0.39 U	4 U	1.9	0.4 U
Benzo(g,h,i)perylene	50	0.4 U	0.39 U	4 U	0.46 J	0.4 U
Fluoranthene	50	0.4 U	0.39 U	4 U	3.8 D	0.041 J
Fluorene	50	0.052 J	0.39 U	4 U	2.8	0.4 U
Naphthalene	13	0.4 U	0.39 U	4 U	0.36 U	0.4 U
Phenanthrene	50	0.16 J	0.39 U	4 U	8.2 D	0.4 U
Pyrene	50	0.4 U	0.39 U	4 U	3.7	0.051 J
Total Non-Carcinogenic PAHs		0.212	0	0	23.95	0.092
Total PAHs		0.212	0	0	29.76	0.092
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	12000 U	12000 U	12000 U	13000 U	13000 U
Dibenzofuran	6200	400 U	390 U	4000 U	1400	400 U
Metals (mg/kg)						
Arsenic	7.5	0.81 B	0.38 B	0.86	0.42 B	0.96
Barium	300	1.5 B	1.6 B	1.5 B	1.2 B	1.8 B
Cadmium	1	0.2 U	0.21 U	0.17 U	0.2 U	0.16 U
Chromium	10	3.3	2.2	1.8	3.3	2.1
Lead	NE*	0.36 B	0.97 B	0.47 B	1.2	2.7
Mercury	0.1	0.02 U	0.017 U	0.02 U	0.018 U	0.019 U
Selenium	2	0.4 U	0.41 U	0.33 U	0.39 U	0.85 B
Silver	NE*	0.3 U	0.31 U	0.25 U	0.29 U	0.24 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.1 U	0.18 B	0.22 B	0.13 B	0.25 B

Table 4-13 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-52		RPSB-53		RPSB-97
		30-32	42-44	25-27	39-41	31-33
		RPSB-52 (30-32)	RPSB-52 (42-44)	RPSB-53 (25-27)	RPSB-53 (39-41)	RPSB-97 (31-33)
		01/14/2000	01/14/2000	02/02/2000	02/02/2000	11/26/2001
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 J	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.002	0.001 U	0.002	0.001 U	0.001 U
Total BTEX		0.003	0	0.002	0	0
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Benzo(a)pyrene	0.061	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Benzo(b)fluoranthene	1.1	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Benzo(k)fluoranthene	1.1	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Chrysene	0.4	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Dibenzo(a,h)anthracene	0.014	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Acenaphthene	50	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Acenaphthylene	41	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Anthracene	50	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Benzo(g,h,i)perylene	50	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Fluoranthene	50	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Fluorene	50	0.4 U	0.42 U	0.37 U	0.047 J	0.42 U
Naphthalene	13	0.4 U	0.42 U	0.37 U	0.4 U	0.42 U
Phenanthrene	50	0.15 J	0.42 U	0.37 U	0.18 J	0.42 U
Pyrene	50	0.4 U	0.42 U	0.37 U	0.049 J	0.42 U
Total Non-Carcinogenic PAHs		0.15	0	0	0.276	0
Total PAHs		0.15	0	0	0.276	0
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	12000 U	12000 U	13000 U	13000 U	NA
Dibenzofuran	6200	400 U	420 U	370 U	400 U	420 U
Metals (mg/kg)						
Arsenic	7.5	0.36 U	0.57 B	1 B	0.72 B	NA
Barium	300	1.9 B	2.2 B	1.6 B	1.8 B	NA
Cadmium	1	0.25 B	0.22 U	0.059 B	0.084 B	NA
Chromium	10	2.5	1.9 B	2.2	6.1	NA
Lead	NE*	2.1	1.5	0.22 U	0.22 U	NA
Mercury	0.1	0.017 U	0.018 U	0.018 U	0.02 U	NA
Selenium	2	0.48 U	0.44 U	0.38 U	0.38 U	NA
Silver	NE*	0.39 B	0.48 B	0.32 B	0.27 B	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.28 B	0.34 B	0.062 U	0.07 U	0.27 U

Table 4-13 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (24-45 feet)
Rockaway Park Former MGP Site

Notes:

* site background

NE - not established

NA - not analyzed

ND - indicates standard is applicable to analyte detection limit

J - estimated value

U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis

D - identifies all compounds in the analysis completed at secondary dilution factor

B - analyte was found within the laboratory method blank as well as the sample

N - spiked sample recovery was not within control limits (metals)

E - compound concentration exceeds the calibration range

P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.

Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.

TCLP - Toxicity Characteristic Leaching Procedure

mg/kg - milligrams/kilogram or parts per million (ppm)

ug/kg - micrograms/kilogram or parts per billion (ppb)

BTEX is benzene, toluene, ethylbenzene, and xylene.

PAHs are polycyclic aromatic hydrocarbons.

Table 4-14
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPMW-14D2	RPMW-15D	RPSB-25	RPSB-33	RPSB-48
		67-77	67-77	50-52	45-47	45-47
		RPMW-14D2 (67-77)	RPMW-15D (67-77)	RPSB-25 (50-52)	RPSB-33 (45-47)	RPSB-48 (45-47)
		08/19/2002	08/20/2002	12/21/1999	12/22/1999	01/24/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.002
Ethyl benzene	5.5	0.001 U	0.002	0.003	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.002	0.001 U	0.004	0.004
Xylene (total)	1.2	0.001 U	0.004	0.002	0.004	0.003
Total BTEX		0	0.008	0.005	0.008	0.009
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Benzo(a)pyrene	0.061	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Benzo(b)fluoranthene	1.1	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Benzo(k)fluoranthene	1.1	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Chrysene	0.4	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Acenaphthene	50	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Acenaphthylene	41	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Anthracene	50	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Benzo(g,h,i)perylene	50	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Fluoranthene	50	0.38 U	0.4 U	0.042 J	0.42 U	0.4 U
Fluorene	50	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Naphthalene	13	0.38 U	0.4 U	0.4 U	0.42 U	0.4 U
Phenanthrene	50	0.38 U	0.4 U	0.15 J	0.047 J	0.4 U
Pyrene	50	0.38 U	0.4 U	0.11 J	0.42 U	0.4 U
Total Non-Carcinogenic PAHs		0	0	0.302	0.047	0
Total PAHs		0	0	0.302	0.047	0
Other Semivolatile Organic Compounds (ug/kg)						
Benzene, hydroxy-	NE	NA	NA	15000 U	12000 U	13000 U
Dibenzofuran	6200	380 U	400 U	400 U	420 U	400 U
Metals (mg/kg)						
Arsenic	7.5	NA	NA	0.63 B	0.36 B	0.35 U
Barium	300	NA	NA	1.8 B	3 B	1.9 B
Cadmium	1	NA	NA	0.2 U	0.23 B	0.23 U
Chromium	10	NA	NA	1.6 B	2.7	2.9
Lead	NE*	NA	NA	0.5 B	2.2	0.84 B
Mercury	0.1	NA	NA	0.02 U	0.019 U	0.21 U
Selenium	2	NA	NA	0.39 U	0.76 B	0.47 U
Silver	NE*	NA	NA	0.3 U	0.28 B	0.35 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.25 UJ	0.25 U	0.12 B	0.096 B	0.24 B

Table 4-14 (continued)
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-54		RPSB-97	
		50-52 RPSB-54 (50-52) 01/13/2000	50-52 RPSB-54 (50-52) 01/13/2000	47-49 RPSB-97 (47-49) 11/27/2001	57-59 RPSB-97 (57-59) 11/27/2001
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	NA	0.001 U	0.001 U
Ethyl benzene	5.5	0.003	NA	0.002	0.001 U
Toluene	1.5	0.014	NA	0.029	0.002
Xylene (total)	1.2	0.039	NA	0.021	0.001 U
Total BTEX		0.056	NA	0.052	0.002
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.4 U	NA	0.41 U	0.41 U
Benzo(a)pyrene	0.061	0.4 U	NA	0.41 U	0.41 U
Benzo(b)fluoranthene	1.1	0.4 U	NA	0.41 U	0.41 U
Benzo(k)fluoranthene	1.1	0.4 U	NA	0.41 U	0.41 U
Chrysene	0.4	0.4 U	NA	0.41 U	0.41 U
Dibenzo(a,h)anthracene	0.014	0.4 U	NA	0.41 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	NA	0.41 U	0.41 U
Total Carcinogenic PAHs		0	NA	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.4 U	NA	0.41 U	0.41 U
Acenaphthene	50	0.4 U	NA	0.41 U	0.41 U
Acenaphthylene	41	0.4 U	NA	0.41 U	0.41 U
Anthracene	50	0.4 U	NA	0.41 U	0.41 U
Benzo(g,h,i)perylene	50	0.4 U	NA	0.41 U	0.41 U
Fluoranthene	50	0.4 U	NA	0.41 U	0.41 U
Fluorene	50	0.4 U	NA	0.41 U	0.41 U
Naphthalene	13	0.4 U	NA	0.41 U	0.41 U
Phenanthrene	50	0.4 U	NA	0.41 U	0.41 U
Pyrene	50	0.4 U	NA	0.41 U	0.41 U
Total Non-Carcinogenic PAHs		0	NA	0	0
Total PAHs		0	NA	0	0
Other Semivolatile Organic Compounds (ug/kg)					
Benzene, hydroxy-	NE	NA	12000 U	NA	NA
Dibenzofuran	6200	400 U	NA	410 U	410 U
Metals (mg/kg)					
Arsenic	7.5	0.79 B	NA	NA	NA
Barium	300	1.5 B*	NA	NA	NA
Cadmium	1	0.18 U	NA	NA	NA
Chromium	10	3.7	NA	NA	NA
Lead	NE*	1.4 *	NA	NA	NA
Mercury	0.1	0.018 U	NA	NA	NA
Selenium	2	0.36 U	NA	NA	NA
Silver	NE*	0.27 U	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.085 B	NA	0.30 U	0.29 U

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limi
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysi
D - identifies all compounds in the analysis completed at secondary dilution facto
B - analyte was found within the laboratory method blank as well as the sampl
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons.

Table 4-15
Soil Analytical Results
Former 2-Million Cubic Foot Holder and Drip Tank Area (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date RPMW-14D2 97-107 RPMW-14D2 (97-107) 08/20/2002
Volatile Organic Compounds (VOCs)		
BTEX (mg/kg)		
Benzene	0.06	0.002
Ethyl benzene	5.5	0.001
Toluene	1.5	0.002
Xylene (total)	1.2	0.002
Total BTEX		0.007
Semivolatile Organic Compounds (SVOCs)		
Carcinogenic PAHs (mg/kg)		
Benzo(a)anthracene	0.224	0.39 U
Benzo(a)pyrene	0.061	0.39 U
Benzo(b)fluoranthene	1.1	0.39 U
Benzo(k)fluoranthene	1.1	0.39 U
Chrysene	0.4	0.39 U
Dibenzo(a,h)anthracene	0.014	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U
Total Carcinogenic PAHs		0
Non-Carcinogenic PAHs (mg/kg)		
2-Methylnaphthalene	36.4	0.39 U
Acenaphthene	50	0.39 U
Acenaphthylene	41	0.39 U
Anthracene	50	0.39 U
Benzo(g,h,i)perylene	50	0.39 U
Fluoranthene	50	0.39 U
Fluorene	50	0.39 U
Naphthalene	13	0.39 U
Phenanthrene	50	0.042 J
Pyrene	50	0.39 U
Total Non-Carcinogenic PAHs		0.042
Total PAHs		0.042
Other Semivolatile Organic Compounds (ug/kg)		
Benzene, hydroxy-	NE	NA
Dibenzofuran	6200	390 U
Metals (mg/kg)		
Arsenic	7.5	NA
Barium	300	NA
Cadmium	1	NA
Chromium	10	NA
Lead	NE*	NA
Mercury	0.1	NA
Selenium	2	NA
Silver	NE*	NA
Total Cyanide (mg/kg)		
Cyanide, total	NE	0.25 UJ

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-16
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		B-13		B-16	GP-31	GP-32
		8.35 RB-112498-B13 11/24/1998	10.00 RB-112498-B13 11/24/1998	10.00 RB-112498-B16 11/24/1998	2.25 GP-31 12/30/1998	6.40 GP-32 12/30/1998
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	1.5 U	NA	NA	0.005 U	0.006 U
Ethyl benzene	5.5	2.3	NA	NA	0.005 U	0.006 U
Toluene	1.5	1.2 J	NA	NA	0.005 U	0.006 U
Xylene (total)	1.2	**28**	NA	NA	0.005 U	0.006 U
Total BTEX		31.5	NA	NA	0	0
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	NA	0.42 U	0.4 U	0.046 J	0.40 U
Benzo(a)pyrene	0.061	NA	0.42 U	0.4 U	0.035 J	0.40 U
Benzo(b)fluoranthene	1.1	NA	0.42 U	0.4 U	0.023 J	0.40 U
Benzo(k)fluoranthene	1.1	NA	0.42 U	0.4 U	0.037 J	0.40 U
Chrysene	0.4	NA	0.42 U	0.4 U	0.051 J	0.40 U
Dibenzo(a,h)anthracene	0.014	NA	0.42 U	0.4 U	0.34 U	0.40 U
Indeno(1,2,3-cd)pyrene	3.2	NA	0.42 U	0.4 U	0.02 J	0.40 U
Total Carcinogenic PAHs		NA	0	0	0.212	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	NA	0.42 U	0.4 U	0.34 U	0.40 U
Acenaphthene	50	NA	0.061 J	0.4 U	0.006 J	0.40 U
Acenaphthylene	41	NA	0.42 U	0.4 U	0.02 J	0.40 U
Anthracene	50	NA	0.42 U	0.4 U	0.027 J	0.40 U
Benzo(g,h,i)perylene	50	NA	0.42 U	0.4 U	0.027 J	0.40 U
Fluoranthene	50	NA	0.42 U	0.4 U	0.061 J	0.002 J
Fluorene	50	NA	0.420 U	0.4 U	0.042 J	0.40 U
Naphthalene	13	NA	0.11 J	0.4 U	0.067 J	0.002 J
Phenanthrene	50	NA	0.059 J	0.4 U	0.16 J	0.005 J
Pyrene	50	NA	0.063 J	0.4 U	0.18 J	0.005 J
Total Non-Carcinogenic PAHs		NA	0.293	0	0.59	0.014
Total PAHs		NA	0.293	0	0.802	0.014

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		B-13		B-16	GP-31	GP-32
		8.35 RB-112498-B13 11/24/1998	10.00 RB-112498-B13 11/24/1998	10.00 RB-112498-B16 11/24/1998	2.25 GP-31 12/30/1998	6.40 GP-32 12/30/1998
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	0.7 B	NA	0.4 U	1.7 B	0.91 B
Barium	300	13.4 B	NA	2.1 B	3.2 B	1.0 B
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	0.1 B	NA	0.07 U	0.22 B	0.21 U
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	7	NA	1.6 B	4.8	4.1
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	2.1	NA	2.4	2.3	0.43 U
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	0.1 U	NA	0.1 U	0.037 U	0.049 U
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	0.8 U	NA	0.8 U	0.56 U	0.79 B
Silver	NE*	0.3 U	NA	0.3 U	0.19 U	0.21 U
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	1.3 U	NA	1.2 U	1.9	2.26
Polychlorinated Biphenyls (PCBs) (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	34 U	40 U
Aroclor 1254	1000/10000	NA	NA	NA	34 U	40 U
Aroclor 1260	1000/10000	NA	NA	NA	34 U	40 U

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		B-13		B-16	GP-31	GP-32
		8.35 RB-112498-B13 11/24/1998	10.00 RB-112498-B13 11/24/1998	10.00 RB-112498-B16 11/24/1998	2.25 GP-31 12/30/1998	6.40 GP-32 12/30/1998
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		GP-33	GP-34		RPSB-105	RPSB-108
		6.00	6.00	8-10	4-6	4-6
		GP-33	GP-34	GP34 (8-10)	RPSB-105 (4-6)	RPSB-108 (4-6)
		12/30/1998	12/30/1998	12/30/1998	11/06/2001	11/06/2001
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.006 U	0.006 U	0.006 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.006 U	0.006 U	0.006 U	0.001 U	0.001 U
Toluene	1.5	0.006 U	0.006 U	0.006 U	0.001 U	0.001 U
Xylene (total)	1.2	0.006 U	0.006 U	0.006 U	0.001 U	0.001 U
Total BTEX		0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.004 J	0.40 U	0.004 J	0.39 U	0.4 U
Benzo(a)pyrene	0.061	0.40 U	0.40 U	0.4 U	0.39 U	0.4 U
Benzo(b)fluoranthene	1.1	0.002 J	0.40 U	0.4 U	0.39 U	0.4 U
Benzo(k)fluoranthene	1.1	0.004 J	0.40 U	0.4 U	0.39 U	0.4 U
Chrysene	0.4	0.003 J	0.40 U	0.002 J	0.39 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.40 U	0.40 U	0.4 U	0.39 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.40 U	0.40 U	0.4 U	0.39 U	0.4 U
Total Carcinogenic PAHs		0.013	0	0.006	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.40 U	0.40 U	0.4 U	0.39 U	0.4 U
Acenaphthene	50	0.40 U	0.40 U	0.4 U	0.39 U	0.4 U
Acenaphthylene	41	0.004 J	0.40 U	0.003 J	0.39 U	0.4 U
Anthracene	50	0.001 J	0.001 J	0.4 U	0.39 U	0.4 U
Benzo(g,h,i)perylene	50	0.40 U	0.40 U	0.4 U	0.39 U	0.4 U
Fluoranthene	50	0.002 J	0.003 J	0.003 J	0.39 U	0.4 U
Fluorene	50	0.40 U	0.40 U	0.4 U	0.39 U	0.4 U
Naphthalene	13	0.002 J	0.002 J	0.4 U	0.39 U	0.4 U
Phenanthrene	50	0.002 J	0.003 J	0.4 U	0.39 U	0.4 U
Pyrene	50	0.005 J	0.006 J	0.009 J	0.39 U	0.4 U
Total Non-Carcinogenic PAHs		0.016	0.015	0.015	0	0
Total PAHs		0.029	0.015	0.021	0	0

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		GP-33	GP-34		RPSB-105	RPSB-108
		6.00	6.00	8-10	4-6	4-6
		GP-33	GP-34	GP34 (8-10)	RPSB-105 (4-6)	RPSB-108 (4-6)
		12/30/1998	12/30/1998	12/30/1998	11/06/2001	11/06/2001
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	390 U	400 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	2.1	1.1 B	1.2 B	NA	NA
Barium	300	3.3 B	3.5 B	6.1 B	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	0.2 U	0.21 U	0.21 U	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	4.3	4.5	4	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	0.6 B	0.67	0.99	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	0.028 U	0.054 U	0.049 U	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	0.6 U	0.63 U	0.66 B	NA	NA
Silver	NE*	0.2 U	0.21 U	0.21 U	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.935	0.876	1.95	7 U	7 U
Polychlorinated Biphenyls (PCBs) (ug/kg)						
Aroclor 1242	1000/10000	34 U	34 U	34 U	NA	NA
Aroclor 1254	1000/10000	34 U	34 U	34 U	NA	NA
Aroclor 1260	1000/10000	34 U	34 U	34 U	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		GP-33	GP-34		RPSB-105	RPSB-108
		6.00	6.00	8-10	4-6	4-6
		GP-33	GP-34	GP34 (8-10)	RPSB-105 (4-6)	RPSB-108 (4-6)
		12/30/1998	12/30/1998	12/30/1998	11/06/2001	11/06/2001
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPSB-14		RPSB-64	
		0-2 RPSB-14 (0-2) 12/13/1999	6-8 RPSB-14 (6-8) 12/13/1999	4-6 RPSB-64 (4-6) 10/11/1999	10-12 RPSB-64 (10-12) 10/11/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.002	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.014	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.016	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.065	0.004	0.001 U	0.001 U
Total BTEX		0.097	0.004	0	0
Other Volatile Organic Compounds (ug/kg)					
1,2,3-Trichlorobenzene	NE	5 U	NA	NA	NA
2-Butanone	300	5 U	NA	NA	NA
2-Hexanone	NE	5 U	NA	NA	NA
Acetone	200	5 B	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	25	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	13	NA	NA	NA
Benzene, 1-methylethyl-	NE	1 J	NA	NA	NA
Carbon disulfide	2,700	5 U	NA	NA	NA
Chlorobenzene	1,700	5 U	NA	NA	NA
Methylene chloride	100	**160**	NA	NA	NA
n-Butylbenzene	NE	5 U	NA	NA	NA
n-Propylbenzene	NE	5 U	NA	NA	NA
sec-Butylbenzene	NE	5 U	NA	NA	NA
Styrene	NE	5 U	NA	NA	NA
Tetrachloroethene	1,400	8	NA	NA	NA
Trichloroethene	700	1 J	NA	NA	NA
Trichlorofluoromethane	NE	3 J	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**4.8**	0.41 U	0.34 U	0.4 U
Benzo(a)pyrene	0.061	**4.9**	0.41 U	0.34 U	0.4 U
Benzo(b)fluoranthene	1.1	**5.7**	0.41 U	0.34 U	0.4 U
Benzo(k)fluoranthene	1.1	**2.9 J**	0.41 U	0.34 U	0.4 U
Chrysene	0.4	**5.4**	0.043 J	0.34 U	0.4 U
Dibenzo(a,h)anthracene	0.014	**0.94 J**	0.41 U	0.34 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	3.2 J	0.41 U	0.34 U	0.4 U
Total Carcinogenic PAHs		27.84	0.043	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.56 J	0.41 U	0.34 U	0.4 U
Acenaphthene	50	3.4 U	0.41 U	0.34 U	0.4 U
Acenaphthylene	41	5.4	0.41 U	0.34 U	0.4 U
Anthracene	50	0.88 J	0.41 U	0.34 U	0.4 U
Benzo(g,h,i)perylene	50	3.6	0.41 U	0.34 U	0.4 U
Fluoranthene	50	3.1 J	0.064 J	0.34 U	0.4 U
Fluorene	50	0.58 J	0.41 U	0.34 U	0.4 U
Naphthalene	13	0.53 J	0.41 U	0.34 U	0.4 U
Phenanthrene	50	1.2 J	0.12 J	0.34 U	0.4 U
Pyrene	50	7.8	0.11 J	0.34 U	0.4 U
Total Non-Carcinogenic PAHs		23.65	0.294	0	0
Total PAHs		51.49	0.337	0	0

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPSB-14		RPSB-64	
		0-2 RPSB-14 (0-2) 12/13/1999	6-8 RPSB-14 (6-8) 12/13/1999	4-6 RPSB-64 (4-6) 10/11/1999	10-12 RPSB-64 (10-12) 10/11/1999
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	3400 U	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	3400 U	NA	NA	NA
2,4-Dinitrotoluene	NE	3400 U	NA	NA	NA
2-Methylphenol	1000	3400 U	NA	NA	NA
4-Methylphenol	900	3400 U	NA	NA	NA
Benzene, hydroxy-	NE	12000 U	12000 U	NA	NA
Bis(2-ethylhexyl)phthalate	50000	3400 U	NA	NA	NA
Butylbenzylphthalate	50000	3400 U	NA	NA	NA
Carbazole	NE	3400 U	NA	NA	NA
Dibenzofuran	6200	3400 U	410 U	340 U	400 U
Di-n-butylphthalate	8100	3400 U	NA	NA	NA
Di-n-octylphthalate	50000	3400 U	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	3400 U	NA	NA	NA
Metals (mg/kg)					
Aluminum	NE*	415	NA	NA	NA
Antimony	NE*	0.22 U	NA	NA	NA
Arsenic	7.5	4.9	0.61 B	0.57 B	0.53 B
Barium	300	137	2.6 B	1.5 B	3.8 B
Beryllium	0.16	0.22 U	NA	NA	NA
Cadmium	1	0.5 B	0.21 U	0.24 B	0.22 U
Calcium	NE*	108	NA	NA	NA
Chromium	10	4.3	2.8	4.7	3.2
Cobalt	30	0.9 B	NA	NA	NA
Copper	25	7.3	NA	NA	NA
Iron	2000	**6020**	NA	NA	NA
Lead	NE*	9	1.1	0.84 B	1.1 B
Magnesium	NE*	153	NA	NA	NA
Manganese	NE*	10	NA	NA	NA
Mercury	0.1	**1.8**	0.018 U	0.049 U	0.054 U
Nickel	13	3.8 B	NA	NA	NA
Potassium	NE*	122	NA	NA	NA
Selenium	2	**5.8**	0.62 B	0.69 B	0.45 U
Silver	NE*	0.41 B	0.32 U	0.7 B	0.33 U
Sodium	NE*	16.8 U	NA	NA	NA
Thallium	NE*	0.34 U	NA	NA	NA
Vanadium	150	5.4 B	NA	NA	NA
Zinc	20	7	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	10.4	2.4 B	0.46 B	0.43 B
Polychlorinated Biphenyls (PCBs) (ug/kg)					
Aroclor 1242	1000/10000	180	NA	NA	NA
Aroclor 1254	1000/10000	35 U	NA	NA	NA
Aroclor 1260	1000/10000	240	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPSB-14		RPSB-64	
		0-2 RPSB-14 (0-2) 12/13/1999	6-8 RPSB-14 (6-8) 12/13/1999	4-6 RPSB-64 (4-6) 10/11/1999	10-12 RPSB-64 (10-12) 10/11/1999
Pesticides (ug/kg)					
4,4'-DDD	2900	3.4 U	NA	NA	NA
4,4'-DDE	2100	3.4 U	NA	NA	NA
4,4'-DDT	2100	9	NA	NA	NA
Aldrin	2,900	1.8 U	NA	NA	NA
alpha-BHC	110	3	NA	NA	NA
alpha-Chlordane	5400	1.8 U	NA	NA	NA
beta-BHC	200	1.8 U	NA	NA	NA
delta-BHC	300	1.8 U	NA	NA	NA
Dieldrin	44	4.4	NA	NA	NA
Endosulfan I	900	2	NA	NA	NA
Endosulfan II	900	3.6	NA	NA	NA
Endosulfan sulfate	1000	3.4 U	NA	NA	NA
Endrin	100	8.9	NA	NA	NA
Endrin aldehyde	NE	3.4 U	NA	NA	NA
Endrin ketone	NE	14	NA	NA	NA
gamma-Chlordane	540	1.8 U	NA	NA	NA
Heptachlor	100	1.8 U	NA	NA	NA
Heptachlor epoxide	20	4	NA	NA	NA
Lindane	NE	1.8 U	NA	NA	NA
Methoxychlor	NE	50	NA	NA	NA
Toxaphene	NE	180 U	NA	NA	NA
TCLP					
TCLP Benzene (ug/l)					
Benzene (TCLP)	NE	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)					
o-Cresol (TCLP)	NE	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA
TCLP Metals (ug/l)					
Arsenic (TCLP)	NE	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPSB-65		RPSB-66	
		6-8 RPSB-65 (6-8) 10/12/1999	10-12 RPSB-65 (10-12) 10/12/1999	6-8 RPSB-66 (6-8) 10/12/1999	10-12 RPSB-66 (10-12) 10/12/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.007
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.11 D
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.002
Xylene (total)	1.2	0.001 U	0.001 U	0.023	0.35
Total BTEX		0	0	0.023	0.469
Other Volatile Organic Compounds (ug/kg)					
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.41 U	0.092 J	**8.1**	**0.42**
Benzo(a)pyrene	0.061	0.41 U	**0.098 J**	**4.2**	**0.25 J**
Benzo(b)fluoranthene	1.1	0.41 U	0.078 J	**4.2**	0.22 J
Benzo(k)fluoranthene	1.1	0.41 U	0.04 J	**2.4**	0.085 J
Chrysene	0.4	0.41 U	0.11 J	**9**	0.38 J
Dibenzo(a,h)anthracene	0.014	0.41 U	0.38 U	**0.44**	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.38 U	**1.1**	0.093 J
Total Carcinogenic PAHs		0	0.418	29.44	1.448
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.15 J	0.38 U	1.4 J	0.31 J
Acenaphthene	50	0.41 U	0.052 J	12 J	1.8 J
Acenaphthylene	41	0.41 U	0.043 J	3.8	0.14 J
Anthracene	50	0.41 U	0.38 U	7.2	0.48
Benzo(g,h,i)perylene	50	0.41 U	0.38 U	1 J	0.12 J
Fluoranthene	50	0.41 U	0.055 J	12 J	0.96
Fluorene	50	0.41 U	0.38 U	12 J	0.75
Naphthalene	13	0.11 J	0.38 U	2.8 J	3.1 J
Phenanthrene	50	0.41 U	0.38 U	14 J	2 J
Pyrene	50	0.41 U	0.15 J	16	1.2 J
Total Non-Carcinogenic PAHs		0.26	0.3	82.2	10.86
Total PAHs		0.26	0.718	111.64	12.308

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPSB-65		RPSB-66	
		6-8 RPSB-65 (6-8) 10/12/1999	10-12 RPSB-65 (10-12) 10/12/1999	6-8 RPSB-66 (6-8) 10/12/1999	10-12 RPSB-66 (10-12) 10/12/1999
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	410 U	380 U	740	97 J
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA
Metals (mg/kg)					
Aluminum	NE*	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA
Arsenic	7.5	0.62 B	0.84 B	0.41 B	0.4 B
Barium	300	2.5 B	4.5 B	2.7 B	5.3 B
Beryllium	0.16	NA	NA	NA	NA
Cadmium	1	0.23 U	0.24 U	0.21 U	0.24 U
Calcium	NE*	NA	NA	NA	NA
Chromium	10	1.8 B	4.3	2.7	3.3
Cobalt	30	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA
Lead	NE*	0.67 B	1.3	2.6	13.3
Magnesium	NE*	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA
Mercury	0.1	0.054 U	0.053 U	0.06 U	0.049 U
Nickel	13	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA
Selenium	2	0.47 U	0.47 U	0.43 U	0.48 U
Silver	NE*	0.35 U	0.35 U	0.32 U	0.36 U
Sodium	NE*	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	1	2	0.94 B	0.059 U
Polychlorinated Biphenyls (PCBs) (ug/kg)					
Aroclor 1242	1000/10000	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPSB-65		RPSB-66	
		6-8 RPSB-65 (6-8) 10/12/1999	10-12 RPSB-65 (10-12) 10/12/1999	6-8 RPSB-66 (6-8) 10/12/1999	10-12 RPSB-66 (10-12) 10/12/1999
Pesticides (ug/kg)					
4,4'-DDD	2900	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA
TCLP					
TCLP Benzene (ug/l)					
Benzene (TCLP)	NE	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)					
o-Cresol (TCLP)	NE	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA
TCLP Metals (ug/l)					
Arsenic (TCLP)	NE	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSB-71			RPSB-72		
		4-6 RPSB-71 (4-6) 03/03/2000	6-8 RPSB-71 (6-8) 03/03/2000	8-10 RPSB-71 (8-10) 03/03/2000	4-6 RPSB-72 (4-6) 03/02/2000	6-8 RPSB-72 (6-8) 03/02/2000	8-10 RPSB-72 (8-10) 03/02/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.003	0.001 U	0.002	0.001 U	0.001 U	0.001 U
Total BTEX		0.004	0	0.002	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	5 U	NA	NA	5 U	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1,700	NA	5 U	NA	NA	5 U	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	5 U	NA	NA	5 U	NA
Trichloroethene	700	NA	5 U	NA	NA	5 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Benzo(a)pyrene	0.061	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Benzo(b)fluoranthene	1.1	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Benzo(k)fluoranthene	1.1	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Chrysene	0.4	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Dibenzo(a,h)anthracene	0.014	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Acenaphthene	50	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Acenaphthylene	41	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Anthracene	50	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Benzo(g,h,i)perylene	50	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Fluoranthene	50	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Fluorene	50	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Naphthalene	13	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Phenanthrene	50	3.4 U	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Pyrene	50	0.37 J	0.34 U	0.4 U	0.35 U	0.38 U	0.4 U
Total Non-Carcinogenic PAHs		0.37	0	0	0	0	0
Total PAHs		0.37	0	0	0	0	0

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSB-71			RPSB-72		
		4-6 RPSB-71 (4-6) 03/03/2000	6-8 RPSB-71 (6-8) 03/03/2000	8-10 RPSB-71 (8-10) 03/03/2000	4-6 RPSB-72 (4-6) 03/02/2000	6-8 RPSB-72 (6-8) 03/02/2000	8-10 RPSB-72 (8-10) 03/02/2000
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	3400 U	340 U	400 U	350 U	380 U	400 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	1.8	0.56 B	1.2	2.5	0.46 B	0.71 B
Polychlorinated Biphenyls (PCBs) (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSB-71			RPSB-72		
		4-6 RPSB-71 (4-6) 03/03/2000	6-8 RPSB-71 (6-8) 03/03/2000	8-10 RPSB-71 (8-10) 03/03/2000	4-6 RPSB-72 (4-6) 03/02/2000	6-8 RPSB-72 (6-8) 03/02/2000	8-10 RPSB-72 (8-10) 03/02/2000
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	0.33 U	NA	NA	0.33 U	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	0.17 U	NA	NA	0.17 U	NA
Heptachlor epoxide	20	NA	0.17 U	NA	NA	0.17 U	NA
Lindane	NE	NA	0.17 U	NA	NA	0.17 U	NA
Methoxychlor	NE	NA	1.7 U	NA	NA	1.7 U	NA
Toxaphene	NE	NA	17 U	NA	NA	17 U	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	5 U	NA	NA	5 U	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	33 U	NA	NA	33 U	NA
p-Cresol (TCLP)	NE	NA	33 U	NA	NA	33 U	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	4.2 B	NA	NA	4 U	NA
Barium (TCLP)	NE	NA	13.6 B	NA	NA	9.6 B	NA
Cadmium (TCLP)	NE	NA	0.4 U	NA	NA	0.4 U	NA
Chromium (TCLP)	NE	NA	2 U	NA	NA	2 U	NA
Lead (TCLP)	NE	NA	2.3 U	NA	NA	6.3 B	NA
Selenium (TCLP)	NE	NA	8.2 B	NA	NA	5.4 B	NA
Silver (TCLP)	NE	NA	2 U	NA	NA	2 U	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date		
		RPSB-88	RPSB-89	TP-11B
		4-6	7-9	10-11
		RPSB-88 (4-6)	RPSB-89 (7-9)	RPTP-11 (10-11)
		11/01/2001	11/13/2001	10/25/1995
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	0.001 U	0.16 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.16 U
Toluene	1.5	0.002	0.001 U	0.16 U
Xylene (total)	1.2	0.004	0.001 U	0.16 U
Total BTEX		0.006	0	0
Other Volatile Organic Compounds (ug/kg)				
1,2,3-Trichlorobenzene	NE	NA	NA	NA
2-Butanone	300	NA	NA	NA
2-Hexanone	NE	NA	NA	NA
Acetone	200	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	160 U
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA
Methylene chloride	100	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA
Styrene	NE	NA	NA	160 U
Tetrachloroethene	1,400	NA	NA	NA
Trichloroethene	700	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.39 U	0.048 J	0.16 U
Benzo(a)pyrene	0.061	0.39 U	0.058 J	0.16 U
Benzo(b)fluoranthene	1.1	0.39 U	0.05 J	0.16 U
Benzo(k)fluoranthene	1.1	0.39 U	0.4 U	0.16 U
Chrysene	0.4	0.39 U	0.065 J	0.16 U
Dibenzo(a,h)anthracene	0.014	0.39 U	0.4 U	0.16 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.4 U	0.16 U
Total Carcinogenic PAHs		0	0.221	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.39 U	0.4 U	0.16 U
Acenaphthene	50	0.39 U	0.4 U	0.16 U
Acenaphthylene	41	0.39 U	0.065 J	0.16 U
Anthracene	50	0.39 U	0.071 J	0.16 U
Benzo(g,h,i)perylene	50	0.39 U	0.4 U	0.16 U
Fluoranthene	50	0.39 U	0.087 J	0.16 U
Fluorene	50	0.39 U	0.054 J	0.16 U
Naphthalene	13	0.39 U	0.4 U	0.16 U
Phenanthrene	50	0.39 U	0.26 J	0.16 U
Pyrene	50	0.39 U	0.19 J	0.16 U
Total Non-Carcinogenic PAHs		0	0.727	0
Total PAHs		0	0.948	0

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date		
		RPSB-88	RPSB-89	TP-11B
		4-6	7-9	10-11
		RPSB-88 (4-6)	RPSB-89 (7-9)	RPTP-11 (10-11)
		11/01/2001	11/13/2001	10/25/1995
Other Semivolatile Organic Compounds (ug/kg)				
1,2-Dichlorobenzene	7900	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	0.16 U
2,4-Dimethylphenol	NE	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA
4-Methylphenol	900	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA
Carbazole	NE	NA	NA	NA
Dibenzofuran	6200	390 U	400 U	160 U
Di-n-butylphthalate	8100	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA
Metals (mg/kg)				
Aluminum	NE*	NA	NA	NA
Antimony	NE*	NA	NA	NA
Arsenic	7.5	NA	NA	NA
Barium	300	NA	NA	NA
Beryllium	0.16	NA	NA	NA
Cadmium	1	NA	NA	NA
Calcium	NE*	NA	NA	NA
Chromium	10	NA	NA	NA
Cobalt	30	NA	NA	NA
Copper	25	NA	NA	NA
Iron	2000	NA	NA	NA
Lead	NE*	NA	NA	NA
Magnesium	NE*	NA	NA	NA
Manganese	NE*	NA	NA	NA
Mercury	0.1	NA	NA	NA
Nickel	13	NA	NA	NA
Potassium	NE*	NA	NA	NA
Selenium	2	NA	NA	NA
Silver	NE*	NA	NA	NA
Sodium	NE*	NA	NA	NA
Thallium	NE*	NA	NA	NA
Vanadium	150	NA	NA	NA
Zinc	20	NA	NA	NA
Total Cyanide (mg/kg)				
Cyanide, total	NE	3.1 *	0.51 B	NA
Polychlorinated Biphenyls (PCBs) (ug/kg)				
Aroclor 1242	1000/10000	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA

Table 4-16 (continued)
Soil Analytical Results
Current Electric Substation Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date		
		RPSB-88	RPSB-89	TP-11B
		4-6	7-9	10-11
		RPSB-88 (4-6)	RPSB-89 (7-9)	RPTP-11 (10-11)
		11/01/2001	11/13/2001	10/25/1995
Pesticides (ug/kg)				
4,4'-DDD	2900	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA
Aldrin	2,900	NA	NA	NA
alpha-BHC	110	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA
beta-BHC	200	NA	NA	NA
delta-BHC	300	NA	NA	NA
Dieldrin	44	NA	NA	NA
Endosulfan I	900	NA	NA	NA
Endosulfan II	900	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA
Endrin	100	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA
Endrin ketone	NE	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA
Heptachlor	100	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA
Lindane	NE	NA	NA	NA
Methoxychlor	NE	NA	NA	NA
Toxaphene	NE	NA	NA	NA
TCLP				
TCLP Benzene (ug/l)				
Benzene (TCLP)	NE	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)				
o-Cresol (TCLP)	NE	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA
TCLP Metals (ug/l)				
Arsenic (TCLP)	NE	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-17
Soil Analytical Results
Current Electric Substation Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		B-15	GP-30	RPSB-07	RPSB-08
		14.00	13-15	15-17	15-17
		RB-112498-B15	GP30 (13-15)	RPSB-07 (15-17)	RPSB-08 (15-17)
		11/24/1998	12/30/1998	12/13/1999	12/13/1999
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	NA	0.006 U	0.001 U	0.001 U
Ethyl benzene	5.5	NA	0.006 U	0.001 J	0.001 U
Toluene	1.5	NA	0.006 U	0.002	0.001 U
Xylene (total)	1.2	NA	0.006 U	0.006	0.002
Total BTEX		NA	0	0.009	0.002
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.059 J	0.009 J	0.4 U	0.05 J
Benzo(a)pyrene	0.061	**0.075 J**	0.007 J	0.4 U	0.045 J
Benzo(b)fluoranthene	1.1	0.065 J	0.41 U	0.4 U	0.044 J
Benzo(k)fluoranthene	1.1	0.4 U	0.41 U	0.4 U	0.42 U
Chrysene	0.4	0.056 J	0.007 J	0.4 U	0.049 J
Dibenzo(a,h)anthracene	0.014	0.4 U	0.41 U	0.4 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	0.41 U	0.4 U	0.42 U
Total Carcinogenic PAHs		0.255	0.023	0	0.188
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.4 U	0.41 U	0.4 U	0.42 U
Acenaphthene	50	0.056 J	0.41 U	0.4 U	0.42 U
Acenaphthylene	41	0.4 U	0.002 J	0.4 U	0.42 U
Anthracene	50	0.4 U	0.41 U	0.4 U	0.42 U
Benzo(g,h,i)perylene	50	0.4 U	0.41 U	0.4 U	0.42 U
Fluoranthene	50	0.4 U	0.009 J	0.4 U	0.095 J
Fluorene	50	0.4 U	0.41 U	0.4 U	0.42 U
Naphthalene	13	0.4 U	0.002 J	0.4 U	0.42 U
Phenanthrene	50	0.4 U	0.41 U	0.068 J	0.15 J
Pyrene	50	0.094 J	0.023 J	0.065 J	0.14 J
Total Non-Carcinogenic PAHs		0.15	0.036	0.133	0.385
Total PAHs		0.405	0.059	0.133	0.573
Other Semivolatile Organic Compounds (ug/kg)					
Benzene, hydroxy-	NE	NA	NA	12000 U	12000 U
Dibenzofuran	6200	NA	NA	400 U	420 U
Metals (mg/kg)					
Arsenic	7.5	0.4 U	1.1 B	0.48 B	1.6
Barium	300	2.6 B	1.1 B	4.5 B	5.9 B
Cadmium	1	0.07 U	0.2 U	0.22 U	0.4 B
Chromium	10	2.2 B	1.8 B	3	4.3
Lead	NE*	4.2	0.85	1.5	4.3
Mercury	0.1	0.1 U	0.025 U	0.018 U	0.019 U
Selenium	2	0.8 U	0.92 B	0.45 U	0.46 U
Silver	NE*	0.3 U	0.2 U	0.34 U	0.34 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	1.2 U	0.618 U	0.13 B	0.16 B
Polychlorinated Biphenyls (PCBs) (ug/kg)					
Aroclor 1242	10000	NA	34 U	NA	NA
Aroclor 1254	10000	NA	34 U	NA	NA
Aroclor 1260	10000	NA	34 U	NA	NA

Table 4-17 (continued)
Soil Analytical Results
Current Electric Substation Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date		
		RPSB-64	RPSB-65	RPSB-66
		14-16	14-16	14-16
		RPSB-64 (14-16)	RPSB-65 (14-16)	RPSB-66 (14-16)
		10/11/1999	10/12/1999	10/12/1999
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	0.001 U	0.002
Ethyl benzene	5.5	0.001 U	0.001 U	0.11
Toluene	1.5	0.001 U	0.001 U	0.002
Xylene (total)	1.2	0.001 U	0.001 U	0.12
Total BTEX		0	0	0.234
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.39 U	0.39 U	0.39 U
Benzo(a)pyrene	0.061	0.39 U	0.39 U	0.39 U
Benzo(b)fluoranthene	1.1	0.39 U	0.39 U	0.39 U
Benzo(k)fluoranthene	1.1	0.39 U	0.39 U	0.39 U
Chrysene	0.4	0.39 U	0.39 U	0.39 U
Dibenzo(a,h)anthracene	0.014	0.39 U	0.39 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.39 U	0.39 U
Total Carcinogenic PAHs		0	0	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.39 U	0.39 U	0.39 U
Acenaphthene	50	0.39 U	0.39 U	0.052 J
Acenaphthylene	41	0.39 U	0.39 U	0.39 U
Anthracene	50	0.39 U	0.39 U	0.39 U
Benzo(g,h,i)perylene	50	0.39 U	0.39 U	0.39 U
Fluoranthene	50	0.39 U	0.39 U	0.39 U
Fluorene	50	0.39 U	0.39 U	0.39 U
Naphthalene	13	0.39 U	0.39 U	0.18 J
Phenanthrene	50	0.39 U	0.39 U	0.058 J
Pyrene	50	0.39 U	0.39 U	0.39 U
Total Non-Carcinogenic PAHs		0	0	0.29
Total PAHs		0	0	0.29
Other Semivolatile Organic Compounds (ug/kg)				
Benzene, hydroxy-	NE	NA	NA	NA
Dibenzofuran	6200	390 U	390 U	390 U
Metals (mg/kg)				
Arsenic	7.5	0.39 B	0.86 B	0.51 B
Barium	300	1.1 B	2.2 U	1.4 B
Cadmium	1	0.17 U	0.21 U	0.2 U
Chromium	10	1.4 B	2.1	1.2 B
Lead	NE*	0.48 B	0.77 B	0.59 B
Mercury	0.1	0.055 U	0.049 U	0.057 U
Selenium	2	0.35 U	0.42 U	0.4 U
Silver	NE*	0.26 U	0.32 U	0.3 U
Total Cyanide (mg/kg)				
Cyanide, total	NE	0.056 U	0.68 B	0.06 U
Polychlorinated Biphenyls (PCBs) (ug/kg)				
Aroclor 1242	10000	NA	NA	NA
Aroclor 1254	10000	NA	NA	NA
Aroclor 1260	10000	NA	NA	NA

Table 4-17 (continued)
Soil Analytical Results
Current Electric Substation Area (12-24 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-18
Soil Analytical Results
Current Electric Substation Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date		
		RPSB-07		RPSB-08
		27-29 RPSB-07 (27-29) 12/13/1999	39-41 RPSB-07 (39-41) 12/13/1999	30-32 RPSB-08 (30-32) 12/14/1999
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.004	0.002
Xylene (total)	1.2	0.003	0.001 U	0.005
Total BTEX		0.003	0.004	0.007
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.4 U	0.33 U	0.053 J
Benzo(a)pyrene	0.061	0.4 U	0.33 U	0.04 J
Benzo(b)fluoranthene	1.1	0.4 U	0.33 U	0.39 U
Benzo(k)fluoranthene	1.1	0.4 U	0.33 U	0.39 U
Chrysene	0.4	0.4 U	0.33 U	0.054 J
Dibenzo(a,h)anthracene	0.014	0.4 U	0.33 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	0.33 U	0.39 U
Total Carcinogenic PAHs		0	0	0.147
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.4 U	0.33 U	0.39 U
Acenaphthene	50	0.4 U	0.33 U	0.39 U
Acenaphthylene	41	0.4 U	0.33 U	0.39 U
Anthracene	50	0.4 U	0.33 U	0.054 J
Benzo(g,h,i)perylene	50	0.4 U	0.33 U	0.39 U
Fluoranthene	50	0.047 J	0.33 U	0.1 J
Fluorene	50	0.4 U	0.33 U	0.39 U
Naphthalene	13	0.4 U	0.33 U	0.39 U
Phenanthrene	50	0.061 J	0.33 U	0.26 J
Pyrene	50	0.083 J	0.33 U	0.18 J
Total Non-Carcinogenic PAHs		0.191	0	0.594
Total PAHs		0.191	0	0.741
Other Semivolatile Organic Compounds (ug/kg)				
Benzene, hydroxy-	NE	12000 U	12000 U	12000 U
Dibenzofuran	6200	400 U	330 U	390 U
Metals (mg/kg)				
Arsenic	7.5	0.5 B	0.94	0.7 B
Barium	300	3.3 B	3.2 B	1.3 B
Cadmium	1	0.21 U	0.16 U	0.19 U
Chromium	10	1.1 B	3	1.8 B
Lead	NE*	0.71 B	0.93	0.76 B
Mercury	0.1	0.015 U	0.019 U	0.02 U
Selenium	2	0.43 U	0.33 B	0.37 U
Silver	NE*	0.32 U	0.24 U	0.28 U
Total Cyanide (mg/kg)				
Cyanide	NE	0.03 U	0.042 U	0.039 U

Table 4-18 (continued)
Soil Analytical Results
Current Electric Substation Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date		
		RPSB-08	RPSB-14	
		40-42 RPSB-08 (40-42) 12/14/1999	30-32 RPSB-14 (30-32) 12/13/1999	40-42 RPSB-14 (40-42) 12/13/1999
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.007	0.001 U	0.002
Toluene	1.5	0.002	0.001 U	0.003
Xylene (total)	1.2	0.009	0.002	0.007
Total BTEX		0.018	0.002	0.012
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.43 U	0.041 J	0.42 U
Benzo(a)pyrene	0.061	0.43 U	0.39 U	0.42 U
Benzo(b)fluoranthene	1.1	0.43 U	0.39 U	0.42 U
Benzo(k)fluoranthene	1.1	0.43 U	0.39 U	0.42 U
Chrysene	0.4	0.43 U	0.043 J	0.42 U
Dibenzo(a,h)anthracene	0.014	0.43 U	0.39 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.43 U	0.39 U	0.42 U
Total Carcinogenic PAHs		0	0.084	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.43 U	0.39 U	0.42 U
Acenaphthene	50	0.43 U	0.39 U	0.42 U
Acenaphthylene	41	0.43 U	0.39 U	0.42 U
Anthracene	50	0.43 U	0.39 U	0.42 U
Benzo(g,h,i)perylene	50	0.43 U	0.39 U	0.42 U
Fluoranthene	50	0.43 U	0.083 J	0.05 J
Fluorene	50	0.43 U	0.39 U	0.42 U
Naphthalene	13	0.43 U	0.39 U	0.42 U
Phenanthrene	50	0.43 U	0.21 J	0.15 J
Pyrene	50	0.43 U	0.13 J	0.078 J
Total Non-Carcinogenic PAHs		0	0.423	0.278
Total PAHs		0	0.507	0.278
Other Semivolatile Organic Compounds (ug/kg)				
Benzene, hydroxy-	NE	12000 U	12000 U	12000 U
Dibenzofuran	6200	430 U	390 U	420 U
Metals (mg/kg)				
Arsenic	7.5	0.82 B	0.7 B	1.1
Barium	300	2 B	3.7 B	2.1 B
Cadmium	1	0.21 U	0.22 U	0.19 U
Chromium	10	1.4 B	2.4	1.3 B
Lead	NE*	0.72 B	0.71 B	0.59 B
Mercury	0.1	0.02 U	0.02 U	0.019 U
Selenium	2	0.42 U	0.45 U	0.38 U
Silver	NE*	0.32 U	0.34 U	0.29 U
Total Cyanide (mg/kg)				
Cyanide	NE	0.041 U	0.033 U	0.037 U

Table 4-18 (continued)
Soil Analytical Results
Current Electric Substation Area (24-45 feet)
Rockaway Park Former MGP Site

Notes:

* site background

NE - not established

NA - not analyzed

ND - indicates standard is applicable to analyte detection limit

J - estimated value

U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis

D - identifies all compounds in the analysis completed at secondary dilution factor

B - analyte was found within the laboratory method blank as well as the sample

N - spiked sample recovery was not within control limits (metals)

E - compound concentration exceeds the calibration range

P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.

Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.

TCLP - Toxicity Characteristic Leaching Procedure

mg/kg - milligrams/kilogram or parts per million (ppm)

ug/kg - micrograms/kilogram or parts per billion (ppb)

BTEX is benzene, toluene, ethylbenzene, and xylene.

PAHs are polycyclic aromatic hydrocarbons.

Table 4-19
Soil Analytical Results
Current Electric Substation Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date	
		RPSB-89	
		49-51 RPSB-89 (49-51) 11/14/2001	59-61 RPSB-89 (59-61) 11/14/2001
Volatile Organic Compounds (VOCs)			
BTEX (mg/kg)			
Benzene	0.06	0.001 U	0.001 U
Ethyl benzene	5.5	0.019	0.001
Toluene	1.5	0.001 U	0.002
Xylene (total)	1.2	0.006	0.001 U
Total BTEX		0.025	0.003
Semivolatile Organic Compounds (SVOCs)			
Carcinogenic PAHs (mg/kg)			
Benzo(a)anthracene	0.224	0.42 U	0.38 U
Benzo(a)pyrene	0.061	0.42 U	0.38 U
Benzo(b)fluoranthene	1.1	0.42 U	0.38 U
Benzo(k)fluoranthene	1.1	0.42 U	0.38 U
Chrysene	0.4	0.42 U	0.38 U
Dibenzo(a,h)anthracene	0.014	0.42 U	0.38 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 U	0.38 U
Total Carcinogenic PAHs		0	0
Non-Carcinogenic PAHs (mg/kg)			
2-Methylnaphthalene	36.4	0.42 U	0.38 U
Acenaphthene	50	0.083 J	0.38 U
Acenaphthylene	41	0.42 U	0.38 U
Anthracene	50	0.055 J	0.38 U
Benzo(g,h,i)perylene	50	0.42 U	0.38 U
Fluoranthene	50	0.064 J	0.38 U
Fluorene	50	0.42 U	0.38 U
Naphthalene	13	0.049 J	0.38 U
Phenanthrene	50	0.24 J	0.38 U
Pyrene	50	0.088 J	0.38 U
Total Non-Carcinogenic PAHs		0.579	0
Total PAHs		0.579	0
Other Semivolatile Organic Compounds (ug/kg)			
Dibenzofuran	6200	420 U	380 U
Total Cyanide (mg/kg)			
Cyanide	NE	7 U	7 U

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-20
Soil Analytical Results
Bulkhead Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date						
		RPSB-01	RPSB-03	RPSB-05	RPSB-109	RPSB-110	RPSB-111	RPSB-112
		5-7	5-7	4-6	4-6	4-6	4-6	4-6
		RPSB-01 (5-7)	RPSB-03 (5-7)	RPSB-05 (4-6)	RPSB-109 (4-6)	RPSB-110 (4-6)	RPSB-111 (4-6)	RPSB-112 (4-6)
		02/07/2000	02/10/2000	02/16/2000	11/05/2001	11/05/2001	11/05/2001	11/05/2001
Volatile Organic Compounds (VOCs)								
BTEX (mg/kg)								
Benzene	0.06	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.005 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.005 U	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.005 U	0.007	0.001 U	0.005	0.001 U	0.001 U	0.001 U
Total BTEX		0	0.01	0	0.005	0	0	0
Other Volatile Organic Compounds (ug/kg)								
1,2,3-Trichlorobenzene	NE	5 U	NA	NA	NA	NA	NA	NA
2-Butanone	300	5 U	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	5 U	NA	NA	NA	NA	NA	NA
Acetone	200	4 JB	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	5 U	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	5 U	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	5 U	NA	NA	NA	NA	NA	NA
Carbon disulfide	2,700	5 U	NA	NA	NA	NA	NA	NA
Chlorobenzene	1,700	5 U	NA	NA	NA	NA	NA	NA
Methylene chloride	100	5 U	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	5 U	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	5 U	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	5 U	NA	NA	NA	NA	NA	NA
Styrene	NE	5 U	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	5 U	NA	NA	NA	NA	NA	NA
Trichloroethene	700	5 U	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	5 U	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)								
Carcinogenic PAHs (mg/kg)								
Benzo(a)anthracene	0.224	0.34 U	**0.54 J**	0.35 U	0.39 U	0.39 U	0.043 J	0.35 U
Benzo(a)pyrene	0.061	0.34 U	**0.38 J**	0.35 U	0.39 U	0.39 U	0.044 J	0.35 U
Benzo(b)fluoranthene	1.1	0.34 U	0.49 J	0.35 U	0.39 U	0.39 U	0.05 J	0.35 U
Benzo(k)fluoranthene	1.1	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Chrysene	0.4	0.34 U	**0.61 J**	0.35 U	0.39 U	0.39 U	0.051 J	0.35 U
Dibenzo(a,h)anthracene	0.014	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Indeno(1,2,3-cd)pyrene	3.2	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Total Carcinogenic PAHs		0	2.02	0	0	0	0.188	0
Non-Carcinogenic PAHs (mg/kg)								
2-Methylnaphthalene	36.4	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Acenaphthene	50	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Acenaphthylene	41	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Anthracene	50	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Benzo(g,h,i)perylene	50	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Fluoranthene	50	0.34 U	0.45 J	0.35 U	0.39 U	0.39 U	0.083 J	0.35 U
Fluorene	50	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Naphthalene	13	0.34 U	3.5 U	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Phenanthrene	50	0.042 J	0.66 J	0.35 U	0.39 U	0.39 U	0.36 U	0.35 U
Pyrene	50	0.34 U	0.96 J	0.35 U	0.39 U	0.39 U	0.11 J	0.35 U
Total Non-Carcinogenic PAHs		0.042	2.07	0	0	0	0.193	0
Total PAHs		0.042	4.09	0	0	0	0.381	0
Other Semivolatile Organic Compounds (ug/kg)								
1,2-Dichlorobenzene	7900	5 U	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	340 U	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	340 U	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	340 U	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	340 U	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	340 U	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	340 U	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	340 U	NA	NA	NA	NA	NA	NA
Carbazole	NE	340 U	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	340 U	3500 U	350 U	390 U	390 U	360 U	350 U
Di-n-butylphthalate	8100	340 U	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	340 U	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	340 U	NA	NA	NA	NA	NA	NA

Table 4-20 (continued)
Soil Analytical Results
Bulkhead Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date						
		RPSB-01	RPSB-03	RPSB-05	RPSB-109	RPSB-110	RPSB-111	RPSB-112
		5-7	5-7	4-6	4-6	4-6	4-6	4-6
		RPSB-01 (5-7)	RPSB-03 (5-7)	RPSB-05 (4-6)	RPSB-109 (4-6)	RPSB-110 (4-6)	RPSB-111 (4-6)	RPSB-112 (4-6)
		02/07/2000	02/10/2000	02/16/2000	11/05/2001	11/05/2001	11/05/2001	11/05/2001
Metals (mg/kg)								
Aluminum	NE*	313	NA	NA	NA	NA	NA	NA
Antimony	NE*	0.15 U	NA	NA	NA	NA	NA	NA
Arsenic	7.5	0.5 B	2.7	1 B	NA	NA	NA	NA
Barium	300	2.5 B	72.4	3 B	NA	NA	NA	NA
Beryllium	0.16	0.15 U	NA	NA	NA	NA	NA	NA
Cadmium	1	0.15 U	0.99	0.16 B	NA	NA	NA	NA
Calcium	NE*	36000	NA	NA	NA	NA	NA	NA
Chromium	10	0.37 B	11.2	1.7	NA	NA	NA	NA
Cobalt	30	0.35 B	NA	NA	NA	NA	NA	NA
Copper	25	1.1 B	NA	NA	NA	NA	NA	NA
Iron	2000	666	NA	NA	NA	NA	NA	NA
Lead	NE*	0.37 B	162	24.3	NA	NA	NA	NA
Magnesium	NE*	231	NA	NA	NA	NA	NA	NA
Manganese	NE*	22.8	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.013 U	0.068	0.017 U	NA	NA	NA	NA
Nickel	13	0.6 B	NA	NA	NA	NA	NA	NA
Potassium	NE*	103 B	NA	NA	NA	NA	NA	NA
Selenium	2	0.3 U	0.39 U	0.24 U	NA	NA	NA	NA
Silver	NE*	0.23 U	1.3 B	0.28 B	NA	NA	NA	NA
Sodium	NE*	483	NA	NA	NA	NA	NA	NA
Thallium	NE*	0.23 U	NA	NA	NA	NA	NA	NA
Vanadium	150	1.3 B	NA	NA	NA	NA	NA	NA
Zinc	20	3.2 B	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)								
Cyanide, total	NE	0.085 B	2.6	0.092 B	7 U	7 U	1	7 U
Polychlorinated Biphenyls (PCBs) (ug/kg)								
Aroclor 1242	1000/10000	35 U	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	35 U	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	35 U	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)								
4,4'-DDD	2900	3.4 U	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	3.4 U	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	3.4 U	NA	NA	NA	NA	NA	NA
Aldrin	2,900	1.8 U	NA	NA	NA	NA	NA	NA
alpha-BHC	110	1.8 U	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	1.8 U	NA	NA	NA	NA	NA	NA
beta-BHC	200	1.8 U	NA	NA	NA	NA	NA	NA
delta-BHC	300	1.8 U	NA	NA	NA	NA	NA	NA
Dieldrin	44	3.4 U	NA	NA	NA	NA	NA	NA
Endosulfan I	900	1.8 U	NA	NA	NA	NA	NA	NA
Endosulfan II	900	3.4 U	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	3.4 U	NA	NA	NA	NA	NA	NA
Endrin	100	3.4 U	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	3.4 U	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	3.4 U	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	1.8 U	NA	NA	NA	NA	NA	NA
Heptachlor	100	1.8 U	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	1.8 U	NA	NA	NA	NA	NA	NA
Lindane	NE	1.8 U	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	18 U	NA	NA	NA	NA	NA	NA
Toxaphene	NE	180 U	NA	NA	NA	NA	NA	NA
TCLP								
TCLP Benzene (ug/l)								
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)								
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Metals (ug/l)								
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA	NA

Table 4-20 (continued)
Soil Analytical Results
Bulkhead Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSB-113	RPSB-114	RPSB-115	RPSB-70		
		0-2	4-6	8-10	4-6	6-8	8-10
		RPSB-113 (0-2)	RPSB-114 (4-6)	RPSB-115 (8-10)	RPSB-70 (4-6)	RPSB-70 (6-8)	RPSB-70 (8-10)
		03/22/2002	03/22/2002	03/22/2002	03/03/2000	03/03/2000	03/03/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U
Toluene	1.5	0.007	0.001 U	0.001 U	0.002	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U	0.002	0.001	0.001 U
Total BTEX		0.007	0	0	0.004	0.002	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	5 U	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA	NA	5 U	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	NA	NA	NA	5 U	NA
Trichloroethene	700	NA	NA	NA	NA	5 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**2 J**	**59**	0.41 U	**1.6 J**	3.9 U	4 U
Benzo(a)pyrene	0.061	**1.8 J**	**27**	0.41 U	**1.5 J**	3.9 U	4 U
Benzo(b)fluoranthene	1.1	**2.6 J**	**34**	0.41 U	**2.5 J**	3.9 U	4 U
Benzo(k)fluoranthene	1.1	**1.3 J**	**18**	0.41 U	0.71 J	3.9 U	4 U
Chrysene	0.4	**2.6 J**	**65**	0.41 U	**1.7 J**	3.9 U	4 U
Dibenzo(a,h)anthracene	0.014	3.8 U	**1.3 J**	0.41 U	4.5 U	3.9 U	4 U
Indeno(1,2,3-cd)pyrene	3.2	1.3 J	**12**	0.41 U	1.2 J	3.9 U	4 U
Total Carcinogenic PAHs		11.6	216.3	0	9.21	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	3.8 U	21	0.41 U	4.5 U	3.9 U	4 U
Acenaphthene	50	3.8 U	4.3	0.41 U	4.5 U	3.9 U	4 U
Acenaphthylene	41	1.1 J	20	0.41 U	4.5 U	3.9 U	4 U
Anthracene	50	0.72 J	**170 D**	0.41 U	4.5 U	3.9 U	4 U
Benzo(g,h,i)perylene	50	1.5 J	12	0.41 U	1.3 J	3.9 U	4 U
Fluoranthene	50	3.2 J	**150 D**	0.044 J	2.8 J	3.9 U	4 U
Fluorene	50	3.8 U	**68**	0.41 U	4.5 U	3.9 U	4 U
Naphthalene	13	3.8 U	6.6	0.41 U	4.5 U	3.9 U	4 U
Phenanthrene	50	2.2 J	**350 D**	0.41 U	1.5 J	3.9 U	4 U
Pyrene	50	4.5	**240 D**	0.069 J	2.6 J	3.9 U	4 U
Total Non-Carcinogenic PAHs		13.22	1041.9	0.113	8.2	0	0
Total PAHs		24.82	1258.2	0.113	17.41	0	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	3800 U	5300	410 U	4500 U	3900 U	4000 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA

Table 4-20 (continued)
Soil Analytical Results
Bulkhead Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSB-113	RPSB-114	RPSB-115	RPSB-70		
		0-2	4-6	8-10	4-6	6-8	8-10
		RPSB-113 (0-2)	RPSB-114 (4-6)	RPSB-115 (8-10)	RPSB-70 (4-6)	RPSB-70 (6-8)	RPSB-70 (8-10)
		03/22/2002	03/22/2002	03/22/2002	03/03/2000	03/03/2000	03/03/2000
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	**20.4**	**19.6**	1.1	NA	NA	NA
Barium	300	46.6	41.2	3.3 B	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.11 U	0.12 U	0.11 U	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	8.3	6.1	2.2	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	171	206	7.9	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	**0.21**	**0.14**	0.019 U	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.42 U	0.48 U	0.43 U	NA	NA	NA
Silver	NE*	0.11 U	0.12 U	0.11 U	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	6.5	4.5	0.70 B	9.3	0.21 U	0.28 B
Polychlorinated Biphenyls (PCBs) (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	0.33 U	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	0.17 U	NA
Heptachlor epoxide	20	NA	NA	NA	NA	0.17 U	NA
Lindane	NE	NA	NA	NA	NA	0.17 U	NA
Methoxychlor	NE	NA	NA	NA	NA	1.7 U	NA
Toxaphene	NE	NA	NA	NA	NA	17 U	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	5 U	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	33 U	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	33 U	NA
Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	6.5 B	NA
Barium (TCLP)	NE	NA	NA	NA	NA	12.8 B	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	0.4 U	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	2 U	NA
Lead (TCLP)	NE	NA	NA	NA	NA	3.1 B	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	7.4 B	NA
Silver (TCLP)	NE	NA	NA	NA	NA	2 U	NA

Table 4-20 (continued)
Soil Analytical Results
Bulkhead Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSB-83		RPSB-84	RPSB-85	RPSB-86	RPSB-87
		4-6	9-11	4-5	0-2	4-6	4-6
		RPSB-83 (4-6)	RPSB-83 (9-11)	RPSB-84 (4-5)	RPSB-85 (0-2)	RPSB-86 (4-6)	RPSB-87 (4-6)
		03/05/2002	03/05/2002	03/06/2002	03/06/2002	03/07/2002	03/08/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.003 U	0.001 U	0.001 U	0.002	0.001 U	0.001 U
Ethyl benzene	5.5	0.23	0.001 U	0.005	0.002	0.003	0.001 U
Toluene	1.5	0.042	0.002	0.006	0.005	0.002	0.001 U
Xylene (total)	1.2	0.26	0.002	0.008	0.009	0.012	0.002
Total BTEX		0.532	0.004	0.019	0.018	0.017	0.002
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**1.5 J**	0.044 J	0.14 J	**2.5**	0.21 J	0.42 U
Benzo(a)pyrene	0.061	8.2 U	0.42 U	**0.52**	**1.6**	**0.18 J**	0.42 U
Benzo(b)fluoranthene	1.1	8.2 U	0.42 U	0.59	**2.3**	0.23 J	0.42 U
Benzo(k)fluoranthene	1.1	8.2 U	0.42 U	0.19 J	0.72	0.064 J	0.42 U
Chrysene	0.4	**1.5 J**	0.42 U	0.21 J	**2.9**	0.25 J	0.42 U
Dibenzo(a,h)anthracene	0.014	8.2 U	0.42 U	**0.2 J**	**0.42 J**	0.38 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	8.2 U	0.42 U	0.88	1.4	0.13 J	0.42 U
Total Carcinogenic PAHs		3	0.044	2.73	11.84	1.064	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	8.2 U	0.42 U	0.074 J	0.14 J	0.38 U	0.42 U
Acenaphthene	50	8.2 U	0.42 U	0.37 U	0.074 J	0.061 J	0.42 U
Acenaphthylene	41	0.97 J	0.42 U	0.28 J	1.5	0.34 J	0.42 U
Anthracene	50	8.2 U	0.42 U	0.16 J	0.7	0.093 J	0.42 U
Benzo(g,h,i)perylene	50	8.2 U	0.42 U	1	1.7	0.14 J	0.42 U
Fluoranthene	50	2.9 J	0.1 J	0.097 J	2.2	0.21 J	0.42 U
Fluorene	50	8.2 U	0.42 U	0.37 U	0.4 U	0.38 U	0.42 U
Naphthalene	13	8.2 U	0.42 U	0.13 J	0.22 J	0.056 J	0.42 U
Phenanthrene	50	8.2 U	0.42 U	0.11 J	1.1	0.13 J	0.42 U
Pyrene	50	4.1	0.23 J	0.18 J	4.4	0.39	0.42 U
Total Non-Carcinogenic PAHs		7.97	0.33	2.031	12.034	1.42	0
Total PAHs		10.97	0.374	4.761	23.874	2.484	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	8200 U	420 U	370 U	400 U	380 U	420 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA

Table 4-20 (continued)
Soil Analytical Results
Bulkhead Area (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSB-83		RPSB-84	RPSB-85	RPSB-86	RPSB-87
		4-6	9-11	4-5	0-2	4-6	4-6
		RPSB-83 (4-6)	RPSB-83 (9-11)	RPSB-84 (4-5)	RPSB-85 (0-2)	RPSB-86 (4-6)	RPSB-87 (4-6)
		03/05/2002	03/05/2002	03/06/2002	03/06/2002	03/07/2002	03/08/2002
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	1.6	2.0	**8**	**9.2**	4.4	1.4
Barium	300	2.0 B	3.3 B	12.8	26.6	5.0 B	3.8 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.12 U	0.12 U	0.24 B	0.44	0.13 B	0.12 U
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	1.6	6.9	9.7	7.5	2.8	2.9
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	2.2	1.5	25.4	88.9	6.5	1.6
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	0.022 B	0.034 B	0.055	**0.18**	**0.12**	0.021 B
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.46 U	0.47 U	0.42 U	0.44 U	0.43 U	0.46 U
Silver	NE*	0.12 U	0.12 U	0.10 U	0.11 U	0.11 U	0.13 B
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	1.1 B	1.2	0.48 B	0.77 B	0.27 U	0.29 U
Polychlorinated Biphenyls (PCBs) (ug/kg)							
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-20 (continued)
Soil Analytical Results
Bulkhead Area (0-12 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-21
Soil Analytical Results
Bulkhead Area (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPMW-02D2		RPSB-02	RPSB-130	RPSB-86	RPSB-87
		19-23 RPMW-02D2 (19-23) 08/29/2002	19-23 (Dup) RPSBXX082902-1 08/29/2002	20-22 RPSB-02 (20-22) 02/09/2000	22-24 RPSB-130 (22-24) 08/28/2002	21-22 RPSB-86 (21-22) 03/07/2002	21-23 RPSB-87 (21-23) 03/08/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.037	0.058	0.001 U	**0.45**	0.025	0.004
Toluene	1.5	0.002	0.002 U	0.001 U	0.018 U	0.002	0.002 U
Ethyl benzene	5.5	0.057	0.075	0.001 U	0.052	0.019	0.002 U
Xylene (total)	1.2	0.021	0.021	0.002	0.045	0.008	0.006
Total BTEX		0.117	0.154	0.002	0.547	0.054	0.01
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**0.8**	**2.3 J**	0.4 U	**0.44 J**	4.2 U	**0.57**
Benzo(a)pyrene	0.061	**0.4 J**	**1.4 J**	0.4 U	**0.49 J**	4.2 U	**0.44 J**
Benzo(b)fluoranthene	1.1	0.32 J	0.51 J	0.4 U	0.56 J	4.2 U	0.51 J
Benzo(k)fluoranthene	1.1	0.14 J	0.96 J	0.4 U	0.21 J	4.2 U	0.18 J
Chrysene	0.4	**0.69**	**2.1 J**	0.4 U	**0.52 J**	4.2 U	**0.61**
Dibenzo(a,h)anthracene	0.014	0.42 U	1.6 UJ	0.4 U	0.62 U	4.2 U	0.56 U
Indeno(1,2,3-cd)pyrene	3.2	0.088 J	0.31 J	0.4 U	0.26 J	4.2 U	0.27 J
Total Carcinogenic PAHs		2.438	7.58	0	2.48	0	2.58
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.073 J	1.6 UJ	0.4 U	0.22 J	4.2 U	0.068 J
Acenaphthene	50	3.5	15 J	0.4 U	0.31 J	4.2 U	0.073 J
Acenaphthylene	41	0.3 J	1.4 J	0.4 U	0.62 U	4.2 U	0.11 J
Anthracene	50	1.8	6.8 J	0.4 U	0.22 J	0.64 J	0.22 J
Benzo(g,h,i)perylene	50	0.42 U	0.34 J	0.4 U	0.29 J	4.2 U	0.27 J
Fluoranthene	50	2.1	5.3 J	0.4 U	0.96	0.82 J	0.98
Fluorene	50	1.6	6 J	0.4 U	0.1 J	4.2 U	0.098 J
Naphthalene	13	0.34 J	0.79 J	0.4 U	3.5	0.71 J	0.2 J
Phenanthrene	50	4.9	20 J	0.4 U	0.43 J	0.76 J	0.34 J
Pyrene	50	3.6	9.4 J	0.4 U	0.92	0.94 J	0.97
Total Non-Carcinogenic PAHs		18.213	65.03	0	6.95	3.87	3.329
Total PAHs		20.651	72.61	0	9.43	3.87	5.909
Other Semivolatile Organic Compounds (ug/kg)							
Dibenzofuran	6200	140 J	470 J	400 U	620 U	4200 U	560 U
Metals (mg/kg)							
Arsenic	7.5	NA	NA	0.4 B	NA	**10.6**	**13.4**
Barium	300	NA	NA	0.72 B	NA	40.0	51.4
Cadmium	1	NA	NA	0.04 U	NA	0.80	0.95
Chromium	10	NA	NA	0.92 B	NA	**23.2**	**29.9**
Lead	NE*	NA	NA	0.37 B	NA	74.7	97.6
Mercury	0.1	NA	NA	0.018 U	NA	**1.0**	**1.6**
Selenium	2	NA	NA	0.4 U	NA	0.50 B	0.61 U
Silver	NE*	NA	NA	0.2 U	NA	0.12 U	0.15 U
Total Cyanide (mg/kg)							
Cyanide	NE	0.28 U	0.29 U	0.1 U	0.42 U	0.31 U	0.40 U

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-22
Soil Analytical Results
Bulkhead Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		RPSB-01	RPSB-02	RPSB-02A	RPSB-03	RPSB-04
		38-40	40-42	30-32	30-32	25-27
		RPSB-01 (38-40)	RPSB-02 (40-42)	RPSB-02A (30-32)	RPSB-03 (30-32)	RPSB-04 (25-27)
		02/07/2000	02/09/2000	02/18/2000	02/10/2000	02/14/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.002	**0.15**	0.001 U
Toluene	1.5	0.002	0.001	0.001 U	0.012 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.002	0.035	0.63	0.001
Xylene (total)	1.2	0.003	0.003	0.021	0.21	0.001
Total BTEX		0.005	0.006	0.058	0.99	0.002
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.42 U	0.4 U	**8.5**	**28**	0.4 U
Benzo(a)pyrene	0.061	0.42 U	0.4 U	**7**	**21**	0.4 U
Benzo(b)fluoranthene	1.1	0.42 U	0.4 U	**6**	**16**	0.4 U
Benzo(k)fluoranthene	1.1	0.42 U	0.4 U	**2.2**	**8.2 J**	0.4 U
Chrysene	0.4	0.42 U	0.4 U	**8**	**23**	0.4 U
Dibenzo(a,h)anthracene	0.014	0.42 U	0.4 U	**0.97 J**	8.4 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 U	0.4 U	**3.2**	**7.7 J**	0.4 U
Total Carcinogenic PAHs		0	0	35.87	103.9	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.092 J	0.4 U	1.7	**58**	0.4 U
Acenaphthene	50	0.074 J	0.4 U	23	**65**	0.4 U
Acenaphthylene	41	0.058 J	0.4 U	19	4 J	0.4 U
Anthracene	50	0.42 U	0.4 U	3.7	35	0.4 U
Benzo(g,h,i)perylene	50	0.42 U	0.4 U	3.4	8.2 J	0.4 U
Fluoranthene	50	0.42 U	0.4 U	16	47	0.4 U
Fluorene	50	0.42 U	0.4 U	1.5 U	37	0.4 U
Naphthalene	13	0.42 U	0.4 U	12	**91**	0.4 U
Phenanthrene	50	0.047 J	0.4 U	2.2	**110**	0.073 J
Pyrene	50	0.42 U	0.4 U	26 D	**72**	0.4 U
Total Non-Carcinogenic PAHs		0.271	0	107	527.2	0.073
Total PAHs		0.271	0	142.87	631.1	0.073
Other Semivolatile Organic Compounds (ug/kg)						
Dibenzofuran	6200	420 U	400 U	560 J	3500 J	400 U
Metals (mg/kg)						
Arsenic	7.5	1.4 B	0.79 B	**12.9**	2.2	0.65 B
Barium	300	2.1 B	1.8 B	9.7 B	11.3 B	2.7 B
Cadmium	1	0.21 U	0.078 B	1	**1.2**	0.034 U
Chromium	10	1.9 B	1.9	5.1	8.5	2.5
Lead	NE*	0.31 U	0.58 B	90.5	40.2	1.2
Mercury	0.1	0.018 U	0.019 U	**0.26**	**0.44**	0.02 U
Selenium	2	0.42 U	0.33 U	**3.4**	**7.1**	0.34 U
Silver	NE*	0.31 U	0.17 U	2.2 B	0.6 B	0.17 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.057 B	0.12 B	4.6	0.21 B	0.11 U

Table 4-22 (continued)
Soil Analytical Results
Bulkhead Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		RPSB-05	RPSB-116	RPSB-83	RPSB-84	
		24-26	44-46	40-41	24-26	36-37
		RPSB-05 (24-26)	RBSB-116 (44-46)	RPSB-83 (40-41)	RPSB-84 (24-26)	RPSB-84 (36-37)
		02/16/2000	04/01/2002	03/05/2002	03/06/2002	03/06/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.002	0.001 U	0.001 U	0.6 U	0.002
Toluene	1.5	0.001 U	0.001 U	0.002	0.6 U	0.001 U
Ethyl benzene	5.5	0.005	0.008	0.002	**37**	0.002
Xylene (total)	1.2	0.006	0.011	0.001 J	**27**	0.003
Total BTEX		0.013	0.019	0.005	64	0.007
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.39 U	**0.35**	0.39 U	**25**	0.17 J
Benzo(a)pyrene	0.061	0.39 U	**0.3 J**	0.39 U	**15 DJ**	**0.09 J**
Benzo(b)fluoranthene	1.1	0.39 U	0.27 J	0.39 U	**12**	0.07 J
Benzo(k)fluoranthene	1.1	0.39 U	0.1 J	0.39 U	**4.4**	0.09 J
Chrysene	0.4	0.39 U	0.34	0.39 U	**24**	0.15 J
Dibenzo(a,h)anthracene	0.014	0.39 U	**0.038 J**	0.39 U	**1.5 J**	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.15 J	0.39 U	**4.6**	0.4 U
Total Carcinogenic PAHs		0	1.548	0	86.5	0.57
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.39 U	0.97	0.39 U	**200 D**	0.38 J
Acenaphthene	50	0.39 U	2.2	0.055 J	**200 D**	0.94
Acenaphthylene	41	0.39 U	0.44	0.39 U	14	0.15 J
Anthracene	50	0.39 U	0.69	0.39 U	**61**	0.57
Benzo(g,h,i)perylene	50	0.39 U	0.18 J	0.39 U	4.5	0.4 U
Fluoranthene	50	0.39 U	0.74	0.1 J	49	0.37 J
Fluorene	50	0.39 U	0.72	0.39 U	**87 D**	0.49
Naphthalene	13	0.39 U	1.7	0.046 J	**520 D**	1
Phenanthrene	50	0.059 J	2	0.18 J	**250 D**	1.6
Pyrene	50	0.39 U	1	0.08 J	**83 D**	0.4 U
Total Non-Carcinogenic PAHs		0.059	10.64	0.461	1468.5	5.5
Total PAHs		0.059	12.188	0.461	1555	6.07
Other Semivolatile Organic Compounds (ug/kg)						
Dibenzofuran	6200	390 U	79 J	390 U	**7200**	43 J
Metals (mg/kg)						
Arsenic	7.5	0.61 B	0.86 B	0.75 B	0.88 B	0.72 B
Barium	300	2.7 B	3.3 B	1.1 B	2.9 B	1.7 B
Cadmium	1	0.033 U	0.11 U	0.11 U	0.12 U	0.11 U
Chromium	10	3.2	3.4	3.0	1.8	2.0
Lead	NE*	2.6	9.3	0.44 B	14.3	0.53 B
Mercury	0.1	0.019 U	0.019 U	0.020 U	0.086	0.020 U
Selenium	2	0.4 B	0.43 U	0.43 U	0.46 U	0.43 U
Silver	NE*	0.16 U	0.11 U	0.11 U	0.12 U	0.11 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.1 U	0.38 B	0.35 U	0.31 U	0.28 U

Table 4-22 (continued)
Soil Analytical Results
Bulkhead Area (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		RPSB-85		RPSB-86	RPSB-87	RPSB-87A
		24-25 RPSB-85 (24-25) 03/06/2002	36-38 RPSB-85 (36-38) 03/06/2002	40-41 RPSB-86 (40-41) 03/07/2002	37-39 RPSB-87 (37-39) 03/08/2002	38-40 RPSB-87A (38-40) 03/28/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.57 U	0.002	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.57 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	**51 D**	0.001 J	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	**28**	0.002	0.003	0.001 U	0.001 U
Total BTEX		79	0.005	0.003	0	0
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**50**	0.4 U	0.41 U	0.4 U	0.4 U
Benzo(a)pyrene	0.061	**33**	0.4 U	0.41 U	0.4 U	0.4 U
Benzo(b)fluoranthene	1.1	**24**	0.4 U	0.41 U	0.4 U	0.4 U
Benzo(k)fluoranthene	1.1	**10**	0.4 U	0.41 U	0.4 U	0.4 U
Chrysene	0.4	**47**	0.4 U	0.41 U	0.4 U	0.4 U
Dibenzo(a,h)anthracene	0.014	**3.5 J**	0.4 U	0.41 U	0.4 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	**10**	0.4 U	0.41 U	0.4 U	0.4 U
Total Carcinogenic PAHs		177.5	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	**290 D**	0.4 U	0.41 U	0.4 U	0.4 U
Acenaphthene	50	**160 D**	0.4 U	0.41 U	0.4 U	0.4 U
Acenaphthylene	41	**93 D**	0.4 U	0.41 U	0.4 U	0.4 U
Anthracene	50	**110 D**	0.063 J	0.41 U	0.4 U	0.4 U
Benzo(g,h,i)perylene	50	10	0.4 U	0.41 U	0.4 U	0.4 U
Fluoranthene	50	**100 D**	0.053 J	0.41 U	0.4 U	0.4 U
Fluorene	50	**140 D**	0.4 U	0.41 U	0.4 U	0.4 U
Naphthalene	13	**480 D**	0.4 U	0.41 U	0.4 U	0.4 U
Phenanthrene	50	**410 D**	0.11 J	0.41 U	0.4 U	0.4 U
Pyrene	50	**160 D**	0.084 J	0.41 U	0.4 U	0.4 U
Total Non-Carcinogenic PAHs		1953	0.31	0	0	0
Total PAHs		2130.5	0.31	0	0	0
Other Semivolatile Organic Compounds (ug/kg)						
Dibenzofuran	6200	**10000**	400 U	410 U	400 U	400 U
Metals (mg/kg)						
Arsenic	7.5	0.69 B	0.65 B	0.76 B	1.2	1.6
Barium	300	2.2 B	1.2 B	2.4 B	2.2 B	2.0 B
Cadmium	1	0.11 U	0.11 U	0.11 U	0.12 U	0.10 U
Chromium	10	1.7	1.3	4.8	1.8	1.6
Lead	NE*	0.69	0.43 B	1.6	0.55 B	0.72
Mercury	0.1	0.017 U	0.020 U	0.02 U	0.019 U	0.018 U
Selenium	2	0.45 U	0.42 U	0.44 U	0.47 U	0.41 U
Silver	NE*	0.11 U	0.11 U	0.13 B	0.12 U	0.10 U
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.28 U	0.29 U	0.29 U	0.28 U	0.38 U

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limi
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysi
D - identifies all compounds in the analysis completed at secondary dilution facto
B - analyte was found within the laboratory method blank as well as the sampl
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns
The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons.

Table 4-23
Soil Analytical Results
Bulkhead Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPMW-02D2	RPSB-02A	RPSB-04	RPSB-05
		62-66	55-57	45-47	65-67
		RPMW-02D2 (62-66)	RPSB-02A (55-57)	RPSB-04 (45-47)	RPSB-05 (65-67)
		08/29/2002	02/18/2000	02/15/2000	02/17/2000
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.11 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.11 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	**11**	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	**2.8**	0.002	0.001	0.003
Total BTEX		13.8	0.002	0.001	0.003
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**70**	0.4 U	0.39 U	0.38 U
Benzo(a)pyrene	0.061	**55**	0.4 U	0.39 U	0.38 U
Benzo(b)fluoranthene	1.1	**41**	0.4 U	0.39 U	0.38 U
Benzo(k)fluoranthene	1.1	**19 J**	0.4 U	0.39 U	0.38 U
Chrysene	0.4	**64**	0.4 U	0.39 U	0.38 U
Dibenzo(a,h)anthracene	0.014	32 U	0.4 U	0.39 U	0.38 U
Indeno(1,2,3-cd)pyrene	3.2	**14 J**	0.4 U	0.39 U	0.38 U
Total Carcinogenic PAHs		263	0	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	**80**	0.4 U	0.39 U	0.38 U
Acenaphthene	50	36	0.4 U	0.39 U	0.38 U
Acenaphthylene	41	**280**	0.4 U	0.39 U	0.38 U
Anthracene	50	**130**	0.4 U	0.39 U	0.38 U
Fluoranthene	50	**140**	0.4 U	0.39 U	0.38 U
Fluorene	50	**180**	0.4 U	0.39 U	0.38 U
Naphthalene	13	**260**	0.057 J	0.39 U	0.38 U
Phenanthrene	50	**500**	0.4 U	0.39 U	0.38 U
Pyrene	50	**220**	0.048 J	0.39 U	0.38 U
Benzo(ghi)perylene	50	14 J	0.4 U	0.39 U	0.38 U
Total Non-Carcinogenic PAHs		1840	0.105	0	0
Total PAHs		2103	0.105	0	0
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	**14000 J**	400 U	390 U	380 U
Metals (mg/kg)					
Arsenic	7.5	NA	0.47 B	0.59 B	0.53 B
Barium	300	NA	2.1 B	2.2 B	8.5 B
Cadmium	1	NA	0.053 B	0.039 U	0.045 U
Chromium	10	NA	2.7	2.9	5.2
Lead	NE*	NA	0.85 B	0.68 B	1.8
Mercury	0.1	NA	0.017 U	0.019 U	0.019 U
Selenium	2	NA	0.45 U	0.59 B	0.62 B
Silver	NE*	NA	0.22 U	0.2 U	0.23 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.3 U	0.11 U	0.095 U	0.12 U

Table 4-23 (continued)
Soil Analytical Results
Bulkhead Area (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date			
		RPSB-116		RPSB-130	RPSB-87A
		54-56 RPSB-116 (54-56) 04/01/2002	66-68 RPSB-116 (66-68) 04/01/2002	47-57 RPSB-130 (47-57) 08/28/2002	58-60 RPSB-87A (58-60) 03/28/2002
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.002	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.003	0.001 U	0.001 U	0.001 U
Total BTEX		0.005	0	0	0
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**0.23 J**	0.16 J	0.4 U	0.42 U
Benzo(a)pyrene	0.061	**0.19 J**	**0.14 J**	0.4 U	0.42 U
Benzo(b)fluoranthene	1.1	0.16 J	0.13 J	0.4 U	0.42 U
Benzo(k)fluoranthene	1.1	0.075 J	0.044 J	0.4 U	0.42 U
Chrysene	0.4	0.23 J	0.16 J	0.4 U	0.42 U
Dibenzo(a,h)anthracene	0.014	0.33 U	0.33 U	0.4 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.1 J	0.077 J	0.4 U	0.42 U
Total Carcinogenic PAHs		0.985	0.711	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.66	0.24 J	0.4 U	0.42 U
Acenaphthene	50	1.7	0.74	0.4 U	0.42 U
Acenaphthylene	41	0.3 J	0.2 J	0.4 U	0.42 U
Anthracene	50	0.51	0.27 J	0.4 U	0.42 U
Fluoranthene	50	0.52	0.35	0.4 U	0.42 U
Fluorene	50	0.51	0.25 J	0.4 U	0.42 U
Naphthalene	13	1.5	0.44	0.4 U	0.42 U
Phenanthrene	50	1.6	0.82	0.4 U	0.42 U
Pyrene	50	0.72	0.49	0.4 U	0.42 U
Benzo(ghi)perylene	50	0.12 J	0.093 J	0.4 U	0.42 U
Total Non-Carcinogenic PAHs		8.14	3.893	0	0
Total PAHs		9.125	4.604	0	0
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	57 J	330 U	400 U	420 U
Metals (mg/kg)					
Arsenic	7.5	0.75 B	0.71 B	NA	0.90 B
Barium	300	2.7 B	2.5 B	NA	7.9 B
Cadmium	1	0.12 U	0.12 U	NA	0.12 U
Chromium	10	4.2	2.6	NA	6.0
Lead	NE*	19.3	15.8	NA	2.0
Mercury	0.1	0.021 U	0.021 U	NA	0.020 U
Selenium	2	0.48 U	0.49 U	NA	0.50 U
Silver	NE*	0.12 U	0.12 U	NA	0.12 U
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.52 B	0.28 U	0.30 U	0.51 B

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limi
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysi
D - identifies all compounds in the analysis completed at secondary dilution facto
B - analyte was found within the laboratory method blank as well as the sampl
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns
The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons.

Table 4-24
Soil Analytical Results
Bulkhead Area (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date	
		RPMW-02D2	RPSB-130
		97-107	87-97
		RPMW-02D2 (97-107)	RPSB-130 (87-97)
		08/29/2002	08/28/2002
Volatile Organic Compounds (VOCs)			
BTEX (mg/kg)			
Benzene	0.06	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U
Ethyl benzene	5.5	0.002	0.001 U
Xylene (total)	1.2	0.003	0.001 U
Total BTEX		0.005	0
Semivolatile Organic Compounds (SVOCs)			
Carcinogenic PAHs (mg/kg)			
Benzo(a)anthracene	0.224	0.41 U	0.42 UJ
Benzo(a)pyrene	0.061	0.41 U	0.42 UJ
Benzo(b)fluoranthene	1.1	0.41 U	0.42 UJ
Benzo(k)fluoranthene	1.1	0.41 U	0.42 UJ
Chrysene	0.4	0.41 U	0.42 UJ
Dibenzo(a,h)anthracene	0.014	0.41 U	0.42 UJ
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.42 UJ
Total Carcinogenic PAHs		0	0
Non-Carcinogenic PAHs (mg/kg)			
2-Methylnaphthalene	36.4	0.41 U	0.42 UJ
Acenaphthene	50	0.41 U	0.42 UJ
Acenaphthylene	41	0.41 U	0.42 UJ
Anthracene	50	0.41 U	0.42 UJ
Fluoranthene	50	0.41 U	0.42 UJ
Fluorene	50	0.41 U	0.42 UJ
Naphthalene	13	0.41 U	0.42 UJ
Phenanthrene	50	0.1 J	0.42 UJ
Pyrene	50	0.054 J	0.42 UJ
Benzo(ghi)perylene	50	0.41 U	0.42 UJ
Total Non-Carcinogenic PAHs		0.154	0
Total PAHs		0.154	0
Other Semivolatile Organic Compounds (ug/kg)			
Dibenzofuran	6200	410 U	420 UJ
Total Cyanide (mg/kg)			
Cyanide, total	NE	0.27 U	0.31 U

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-25
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPGP-28A	RPSB-103	RPSB-104	RPSB-106	RPSB-107	RPSB-55
		4-8	4-6	4-6	6-8	4-6	10-12
		RPGP-28A (4-8)	RPSB-103 (4-6)	RPSB-104 (4-6)	RPSB-106 (6-8)	RPSB-107 (4-6)	RPSB-55 (10-12)
		07/24/2002	11/07/2001	11/07/2001	11/07/2001	11/07/2001	03/06/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.007	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0.007	0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(a)pyrene	0.061	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(b)fluoranthene	1.1	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(k)fluoranthene	1.1	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Chrysene	0.4	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Acenaphthene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Acenaphthylene	41	0.043 J	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Anthracene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Benzo(g,h,i)perylene	50	0.42 UJ	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Fluoranthene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Fluorene	50	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Naphthalene	13	0.42 U	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Phenanthrene	50	0.047 J	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Pyrene	50	0.056 J	0.4 U	0.36 U	0.35 U	0.37 U	0.4 U
Total Non-Carcinogenic PAHs		0.146	0	0	0	0	0
Total PAHs		0.146	0	0	0	0	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	420 U	400 U	360 U	350 U	370 U	400 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPGP-28A	RPSB-103	RPSB-104	RPSB-106	RPSB-107	RPSB-55
		4-8	4-6	4-6	6-8	4-6	10-12
		RPGP-28A (4-8)	RPSB-103 (4-6)	RPSB-104 (4-6)	RPSB-106 (6-8)	RPSB-107 (4-6)	RPSB-55 (10-12)
		07/24/2002	11/07/2001	11/07/2001	11/07/2001	11/07/2001	03/06/2000
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA	1.1 B
Barium	300	NA	NA	NA	NA	NA	4.9 B
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA	0.044 U
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA	2.4
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA	1.3
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA	0.018 U
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA	0.66 B
Silver	NE*	NA	NA	NA	NA	NA	0.22 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	NA	0.65 B	0.53 B	7 U	0.44 B	0.3 B
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-56	RPSB-73		RPSB-74		
		5-7 RPSB-56 (5-7) 03/06/2000	4-6 RPSB-73 (4-6) 02/25/2000	8-10 RPSB-73 (8-10) 02/25/2000	4-6 RPSB-74 (4-6) 02/25/2000	8-10 RPSB-74 (8-10) 02/25/2000	10-12 RPSB-74 (10-12) 02/25/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.013 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	13 U	NA	NA	NA	NA	NA
2-Butanone	300	13 U	NA	5 U	NA	5 U	NA
2-Hexanone	NE	13 U	NA	NA	NA	NA	NA
Acetone	200	16 B	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	13 U	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	13 U	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	13 U	NA	NA	NA	NA	NA
Carbon disulfide	2700	13 U	NA	NA	NA	NA	NA
Chlorobenzene	1700	13 U	NA	5 U	NA	5 U	NA
Methylene chloride	100	15	NA	NA	NA	NA	NA
n-Butylbenzene	NE	13 U	NA	NA	NA	NA	NA
n-Propylbenzene	NE	13 U	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	13 U	NA	NA	NA	NA	NA
Styrene	NE	13 U	NA	NA	NA	NA	NA
Tetrachloroethene	1400	13 U	NA	5 U	NA	5 U	NA
Trichloroethene	700	13 U	NA	5 U	NA	5 U	NA
Trichlorofluoromethane	NE	13 U	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**26**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(a)pyrene	0.061	**25**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(b)fluoranthene	1.1	**32**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(k)fluoranthene	1.1	**8.4**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Chrysene	0.4	**25**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Dibenzo(a,h)anthracene	0.014	**3.8 J**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	**17**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Total Carcinogenic PAHs		137.2	0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	5.5 J	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Acenaphthene	50	14	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Acenaphthylene	41	3.5 J	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Anthracene	50	19	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Benzo(g,h,i)perylene	50	17	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Fluoranthene	50	**63**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Fluorene	50	13	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Naphthalene	13	8.2	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Phenanthrene	50	**77**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Pyrene	50	**51**	0.34 U	0.4 U	0.34 U	0.41 U	0.4 U
Total Non-Carcinogenic PAHs		271.2	0	0	0	0	0
Total PAHs		408.4	0	0	0	0	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	2900	13 U	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	6800 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	6800 U	NA	33 U	NA	33 U	NA
2-Methylphenol	100	6800 U	NA	33 U	NA	33 U	NA
4-Methylphenol	900	6800 U	NA	33 U	NA	33 U	NA
Benzene, hydroxy-	NE	6800 U	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	6800 U	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	6800 U	NA	NA	NA	NA	NA
Carbazole	NE	9000	NA	NA	NA	NA	NA
Dibenzofuran	6200	**12000**	340 U	400 U	340 U	410 U	400 U
Di-n-butylphthalate	8100	6800 U	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	6800 U	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	6800 U	NA	NA	NA	NA	NA
p-Cymene	NE	13 U	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-56	RPSB-73		RPSB-74		
		5-7 RPSB-56 (5-7) 03/06/2000	4-6 RPSB-73 (4-6) 02/25/2000	8-10 RPSB-73 (8-10) 02/25/2000	4-6 RPSB-74 (4-6) 02/25/2000	8-10 RPSB-74 (8-10) 02/25/2000	10-12 RPSB-74 (10-12) 02/25/2000
Metals (mg/kg)							
Aluminum	NE*	428	NA	NA	NA	NA	NA
Antimony	NE*	0.31 U	NA	NA	NA	NA	NA
Arsenic	7.5	0.94 B	NA	NA	NA	NA	NA
Barium	300	2 B	NA	NA	NA	NA	NA
Beryllium	0.16	0.21 U	NA	NA	NA	NA	NA
Cadmium	1	0.041 U	NA	NA	NA	NA	NA
Calcium	NE*	96.2	NA	NA	NA	NA	NA
Chromium	10	1.5 B	NA	NA	NA	NA	NA
Cobalt	30	1.2 B	NA	NA	NA	NA	NA
Copper	25	3.3	NA	NA	NA	NA	NA
Iron	2000	1520	NA	NA	NA	NA	NA
Lead	NE*	13.5	NA	NA	NA	NA	NA
Magnesium	NE*	88	NA	NA	NA	NA	NA
Manganese	NE*	36	NA	NA	NA	NA	NA
Mercury	0.1	0.017 U	NA	NA	NA	NA	NA
Nickel	13	1.3 B	NA	NA	NA	NA	NA
Potassium	NE*	76.4 B	NA	NA	NA	NA	NA
Selenium	2	0.41 U	NA	NA	NA	NA	NA
Silver	NE*	0.21 U	NA	NA	NA	NA	NA
Sodium	NE*	82.6 B	NA	NA	NA	NA	NA
Thallium	NE*	0.31 U	NA	NA	NA	NA	NA
Vanadium	150	1.6 B	NA	NA	NA	NA	NA
Zinc	20	**26**	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	0.32 B	0.27 B	0.13 B	0.59 B	0.48 B	1.7
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	5 U	NA	5 U	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	33 U	NA	33 U	NA
p-Cresol (TCLP)	NE	NA	NA	33 U	NA	33 U	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	4.4 B	NA	3.9 B	NA
Barium (TCLP)	NE	NA	NA	9.8 B	NA	17.5 B	NA
Cadmium (TCLP)	NE	NA	NA	2 U	NA	2 U	NA
Lead (TCLP)	NE	NA	NA	3 U	NA	3 U	NA
Selenium (TCLP)	NE	NA	NA	4 U	NA	4 U	NA
Silver (TCLP)	NE	NA	NA	3 U	NA	3 U	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-75			RPSB-76		
		4-6 RPSB-75 (4-6) 02/28/2000	6-8 RPSB-75 (6-8) 02/28/2000	8-10 RPSB-75 (8-10) 02/28/2000	4-6 RPSB-76 (4-6) 02/28/2000	6-8 RPSB-76 (6-8) 02/28/2000	8-10 RPSB-76 (8-10) 02/28/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	0.37 U	0.46 U	0.41 U	0.046 J	**10**	0.39 U
Benzo(a)pyrene	0.061	0.37 U	0.46 U	0.41 U	0.35 U	**6.9**	0.39 U
Benzo(b)fluoranthene	1.1	0.37 U	0.46 U	0.41 U	0.35 U	**8.7**	0.39 U
Benzo(k)fluoranthene	1.1	0.37 U	0.46 U	0.41 U	0.35 U	**3.8**	0.39 U
Chrysene	0.4	0.37 U	0.46 U	0.41 U	0.047 J	**7.9**	0.39 U
Dibenzo(a,h)anthracene	0.014	0.37 U	0.46 U	0.41 U	0.35 U	**1 J**	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.37 U	0.46 U	0.41 U	0.35 U	**3.4**	0.39 U
Total Carcinogenic PAHs		0	0	0	0.093	41.7	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.37 U	0.46 U	0.41 U	0.35 U	1.7 U	0.39 U
Acenaphthene	50	0.37 U	0.46 U	0.41 U	0.35 U	1.7 U	0.39 U
Acenaphthylene	41	0.37 U	0.46 U	0.41 U	0.35 U	0.63 J	0.39 U
Anthracene	50	0.37 U	0.46 U	0.41 U	0.35 U	3.3	0.39 U
Benzo(g,h,i)perylene	50	0.37 U	0.46 U	0.41 U	0.35 U	2.5	0.39 U
Fluoranthene	50	0.37 U	0.46 U	0.41 U	0.044 J	17	0.39 U
Fluorene	50	0.37 U	0.46 U	0.41 U	0.35 U	0.65 J	0.39 U
Naphthalene	13	0.37 U	0.46 U	0.41 U	0.35 U	1.7 U	0.39 U
Phenanthrene	50	0.37 U	0.46 U	0.41 U	0.039 J	8	0.39 U
Pyrene	50	0.37 U	0.46 U	0.41 U	0.05 J	14	0.39 U
Total Non-Carcinogenic PAHs		0	0	0	0.133	46.08	0
Total PAHs		0	0	0	0.226	87.78	0
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	370 U	460 U	410 U	350 U	1700 U	390 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA

Table 4-25 (continued)
Soil Analytical Results
South and West Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-75			RPSB-76		
		4-6 RPSB-75 (4-6) 02/28/2000	6-8 RPSB-75 (6-8) 02/28/2000	8-10 RPSB-75 (8-10) 02/28/2000	4-6 RPSB-76 (4-6) 02/28/2000	6-8 RPSB-76 (6-8) 02/28/2000	8-10 RPSB-76 (8-10) 02/28/2000
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	2.1	0.56 B	0.22 B	3.4	0.52 B	0.28 B
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	5 U	NA	NA	5 U	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	33 U	NA	NA	33 U	NA
p-Cresol (TCLP)	NE	NA	33 U	NA	NA	33 U	NA
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	NA	4.8 B	NA	NA	4 U	NA
Barium (TCLP)	NE	NA	19.1 B	NA	NA	9.5 B	NA
Cadmium (TCLP)	NE	NA	0.4 U	NA	NA	0.4 U	NA
Lead (TCLP)	NE	NA	2.3 U	NA	NA	10.6	NA
Selenium (TCLP)	NE	NA	4 U	NA	NA	5.3 B	NA
Silver (TCLP)	NE	NA	2 U	NA	NA	2 U	NA

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-26
Soil Analytical Results
South and West Adjacent Areas (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date	
		RPGP-28A	RPSB-73
		20-24	12-14
		RPGP-28A (20-24)	RPSB-73 (12-14)
		07/24/2002	02/25/2000
Volatile Organic Compounds (VOCs)			
BTEX (mg/kg)			
Benzene	0.06	0.005 U	0.001 U
Ethyl benzene	5.5	0.005 U	0.001 U
Toluene	1.5	0.005 U	0.001 U
Xylene (total)	1.2	0.005 U	0.001 U
Total BTEX		0	0
Other Volatile Organic Compounds (ug/kg)			
2-Butanone	300	5 U	NA
2-Hexanone	NE	1 J	NA
Acetone	110	11	NA
Carbon disulfide	2700	2 J	NA
Chlorobenzene	1700	5 U	NA
Methylene chloride	100	7 B	NA
Styrene	NE	5 U	NA
Tetrachloroethene	1400	5 U	NA
Trichloroethene	700	5 U	NA
Semivolatile Organic Compounds (SVOCs)			
Carcinogenic PAHs (mg/kg)			
Benzo(a)anthracene	0.224	0.38 U	0.4 U
Benzo(a)pyrene	0.061	0.38 U	0.4 U
Benzo(b)fluoranthene	1.1	0.38 U	0.4 U
Benzo(k)fluoranthene	1.1	0.38 U	0.4 U
Chrysene	0.4	0.38 U	0.4 U
Dibenzo(a,h)anthracene	0.014	0.38 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.38 U	0.4 U
Total Carcinogenic PAHs		0	0
Non-Carcinogenic PAHs (mg/kg)			
2-Methylnaphthalene	36.4	0.38 U	0.4 U
Acenaphthene	50	0.38 U	0.4 U
Acenaphthylene	41	0.38 U	0.4 U
Anthracene	50	0.38 U	0.4 U
Benzo(g,h,i)perylene	50	0.38 U	0.4 U
Fluoranthene	50	0.38 U	0.4 U
Fluorene	50	0.38 U	0.4 U
Naphthalene	13	0.38 U	0.4 U
Phenanthrene	50	0.38 U	0.4 U
Pyrene	50	0.38 U	0.4 U
Total Non-Carcinogenic PAHs		0	0
Total PAHs		0	0
Other Semivolatile Organic Compounds (ug/kg)			
1,2-Dichlorobenzene	2900	380 U	NA
2,4-Dimethylphenol	NE	380 U	NA
2,4-Dinitrotoluene	NE	380 U	NA
2-Methylphenol	100	380 U	NA
4-Methylphenol	900	380 U	NA
Benzene, hydroxy-	NE	380 U	NA
Bis(2-ethylhexyl)phthalate	50000	380 U	NA
Butylbenzylphthalate	50000	380 U	NA
Dibenzofuran	6200	380 U	400 U
Di-n-butylphthalate	8100	380 U	NA
Di-n-octylphthalate	50000	380 U	NA
N-Nitrosodiphenylamine (1)	NE	380 U	NA
Total Cyanide (mg/kg)			
Cyanide	NE	NA	0.26 B

Table 4-26 (continued)
Soil Analytical Results
South and West Adjacent Areas (12-24 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-27
Soil Analytical Results
South and West Adjacent Areas (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPGP-28A	RPSB-55	RPSB-56
		40-44	40-42	40-42
		RPGP-28A (40-44)	RPSB-55 (40-42)	RPSB-56 (40-42)
		07/24/2002	03/06/2000	03/06/2000
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.42 U	0.41 U	0.41 U
Benzo(a)pyrene	0.061	0.42 UJ	0.41 U	0.41 U
Benzo(b)fluoranthene	1.1	0.42 UJ	0.41 U	0.41 U
Benzo(k)fluoranthene	1.1	0.42 UJ	0.41 U	0.41 U
Chrysene	0.4	0.42 U	0.41 U	0.41 U
Dibenzo(a,h)anthracene	0.014	0.42 UJ	0.41 U	0.41 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 UJ	0.41 U	0.41 U
Total Carcinogenic PAHs		0	0	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.42 U	0.41 U	0.41 U
Acenaphthene	50	0.42 U	0.41 U	0.41 U
Acenaphthylene	41	0.42 U	0.41 U	0.41 U
Anthracene	50	0.42 U	0.41 U	0.41 U
Benzo(g,h,i)perylene	50	0.42 UJ	0.41 U	0.41 U
Fluoranthene	50	0.42 U	0.41 U	0.41 U
Fluorene	50	0.42 U	0.41 U	0.41 U
Naphthalene	13	0.42 U	0.41 U	0.41 U
Phenanthrene	50	0.42 U	0.41 U	0.41 U
Pyrene	50	0.42 U	0.41 U	0.41 U
Total Non-Carcinogenic PAHs		0	0	0
Total PAHs		0	0	0
Other Semivolatile Organic Compounds (ug/kg)				
Dibenzofuran	6200	420 U	410 U	410 U
Metals (mg/kg)				
Arsenic	7.5	NA	1 B	1.1 B
Barium	300	NA	1.8 B	1.7 B
Chromium	10	NA	1.8 B	2.4
Lead	NE*	NA	0.85 B	0.9 B
Total Cyanide (mg/kg)				
Cyanide, total	NE	NA	0.2 U	0.27 B

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-28
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPMW-16I	RPSB-100	RPSB-101	RPSB-102	RPSB-58
		9-11	4-6	5-7	5-7	4-6
		RPMW-16I (9-11)	RPSB-100 (4-6)	RPSB-101 (5-7)	RPSB-102 (5-7)	RPSB-58 (4-6)
		10/24/2002	11/08/2001	11/15/2001	11/28/2001	01/26/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.018	0.002	0.013
Ethyl benzene	5.5	0.001 U	0.001 U	0.006	0.001 U	0.004
Toluene	1.5	0.001 U	0.003	0.045	0.016	0.04
Xylene (total)	1.2	0.001 U	0.001 U	0.013	0.001	0.02
Total BTEX		0	0.003	0.082	0.019	0.077
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.054 J	0.41 U	**0.62**	**1.6**	0.39 U
Benzo(a)pyrene	0.061	**0.1 J**	0.41 U	**0.59**	**2.6**	0.39 U
Benzo(b)fluoranthene	1.1	0.14 J	0.41 U	1.1	**3.8**	0.39 U
Benzo(k)fluoranthene	1.1	0.054 J	0.41 U	0.4	**1.4**	0.39 U
Chrysene	0.4	0.059 J	0.41 U	**0.94**	**2.6**	0.39 U
Dibenzo(a,h)anthracene	0.014	0.41 UJ	0.41 U	**0.17 J**	**0.58**	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.076 J	0.41 U	0.56	2.3	0.39 U
Total Carcinogenic PAHs		0.483	0	4.38	14.88	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.41 U	0.41 U	0.58	0.054 J	0.39 U
Acenaphthene	50	0.41 U	0.41 U	0.034 J	0.38 U	0.39 U
Acenaphthylene	41	0.41 U	0.23 J	0.31 J	0.74	0.39 U
Anthracene	50	0.41 U	0.11 J	0.14 J	0.31 J	0.39 U
Benzo(g,h,i)perylene	50	0.079 J	0.081 J	0.65	2.3	0.39 U
Fluoranthene	50	0.081 J	0.41 U	0.87	2.2	0.39 U
Fluorene	50	0.41 U	0.41 U	0.044 J	0.086 J	0.39 U
Naphthalene	13	0.41 U	0.41 U	2.1	0.086 J	0.39 U
Phenanthrene	50	0.41 U	0.41 U	0.54	0.86	0.39 U
Pyrene	50	0.084 J	0.41 U	1.2	3.8	0.39 U
Total Non-Carcinogenic PAHs		0.244	0.421	6.468	10.436	0
Total PAHs		0.727	0.421	10.848	25.316	0
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	410 U	410 U	47 J	380 U	390 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPMW-16I 9-11 RPMW-16I (9-11) 10/24/2002	RPSB-100 4-6 RPSB-100 (4-6) 11/08/2001	RPSB-101 5-7 RPSB-101 (5-7) 11/15/2001	RPSB-102 5-7 RPSB-102 (5-7) 11/28/2001	RPSB-58 4-6 RPSB-58 (4-6) 01/26/2000
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	0.41 B
Barium	300	NA	NA	NA	NA	7.4 B
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	0.18 U
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	2.7
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	21
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	0.20 U
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	0.36 U
Silver	NE*	NA	NA	NA	NA	0.27 U
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.29 U	7 U	0.36 B	2.3	0.27 B
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	10	NA	NA	NA	NA	NA
Methoxychlor	140	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-59	RPSB-61	RPSB-62	RPSB-77	
		5-7	10-12	5-7	4-6	6-8
		RPSB-59 (5-7)	RPSB-61 (10-12)	RPSB-62 (5-7)	RPSB-77 (4-6)	RPSB-77 (6-8)
		02/15/2000	02/10/2000	02/11/2000	02/28/2000	02/28/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	**20**	0.005 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	**190**	0.005 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	**180**	0.005 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	**2400**	0.005 U	0.001 U	0.001 U
Total BTEX		0	2790	0	0	0
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	5 U	NA	NA
2-Butanone	300	NA	NA	5 U	NA	NA
2-Hexanone	NE	NA	NA	5 U	NA	NA
Acetone	200	NA	NA	4 JB	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	5 U	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	5 U	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	5 U	NA	NA
Carbon disulfide	2700	NA	NA	5 U	NA	NA
Chlorobenzene	1700	NA	NA	5 U	NA	NA
Methylene chloride	100	NA	NA	3 J	NA	NA
n-Butylbenzene	NE	NA	NA	5 U	NA	NA
n-Propylbenzene	NE	NA	NA	5 U	NA	NA
sec-Butylbenzene	NE	NA	NA	5 U	NA	NA
Styrene	NE	NA	NA	5 U	NA	NA
Tetrachloroethene	1400	NA	NA	5 U	NA	NA
Trichloroethene	700	NA	NA	5 U	NA	NA
Trichlorofluoromethane	NE	NA	NA	5 U	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.43 U	**1.2 J**	0.13 J	0.078 J	**0.52**
Benzo(a)pyrene	0.061	0.43 U	**0.51 J**	0.057 J	**0.075 J**	**0.48**
Benzo(b)fluoranthene	1.1	0.43 U	0.77 J	0.12 J	0.15 J	0.96
Benzo(k)fluoranthene	1.1	0.43 U	0.36 J	0.039 J	0.087 J	0.36 J
Chrysene	0.4	0.43 U	**1.3 J**	0.16 J	0.12 J	**0.83**
Dibenzo(a,h)anthracene	0.014	0.43 U	1.6 U	0.34 U	0.34 U	0.37 U
Indeno(1,2,3-cd)pyrene	3.2	0.43 U	0.31 J	0.052 J	0.047 J	0.38
Total Carcinogenic PAHs		0	4.45	0.558	0.557	3.53
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.43 U	14	0.34 U	0.34 U	0.37 U
Acenaphthene	50	0.43 U	0.94 J	0.34 U	0.34 U	0.37 U
Acenaphthylene	41	0.43 U	1 J	0.054 J	0.34 U	0.081 J
Anthracene	50	0.43 U	1.3 J	0.068 J	0.34 U	0.089 J
Benzo(g,h,i)perylene	50	0.43 U	0.31 J	0.075 J	0.34 U	0.34 J
Fluoranthene	50	0.43 U	3.1	0.19 J	0.09 J	0.96
Fluorene	50	0.43 U	3.6	0.34 U	0.34 U	0.37 U
Naphthalene	13	0.43 U	**46 D**	0.005 U	0.34 U	0.37 U
Phenanthrene	50	0.14 J	10	0.36	0.05 J	0.42
Pyrene	50	0.088 J	4	0.29 J	0.13 J	1.2
Total Non-Carcinogenic PAHs		0.228	84.25	1.037	0.27	3.09
Total PAHs		0.228	88.7	1.595	0.827	6.62
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	2900	NA	NA	5 U	NA	NA
2,4-Dimethylphenol	NE	NA	NA	340 U	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	340 U	NA	NA
2-Methylphenol	100	NA	NA	340 U	NA	NA
4-Methylphenol	900	NA	NA	340 U	NA	NA
Benzene, hydroxy-	NE	NA	NA	340 U	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	340 U	NA	NA
Butylbenzylphthalate	50000	NA	NA	340 U	NA	NA
Carbazole	NA	NA	NA	340 U	NA	NA
Dibenzofuran	6200	430 U	770 J	340 U	340 U	370 U
Di-n-butylphthalate	8100	NA	NA	340 U	NA	NA
Di-n-octylphthalate	50000	NA	NA	340 U	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	340 U	NA	NA
p-Cymene	NE	NA	NA	5 U	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-59	RPSB-61	RPSB-62	RPSB-77	
		5-7	10-12	5-7	4-6	6-8
		RPSB-59 (5-7)	RPSB-61 (10-12)	RPSB-62 (5-7)	RPSB-77 (4-6)	RPSB-77 (6-8)
		02/15/2000	02/10/2000	02/11/2000	02/28/2000	02/28/2000
Metals (mg/kg)						
Aluminum	NE*	NA	NA	212	NA	NA
Antimony	NE*	NA	NA	0.26 U	NA	NA
Arsenic	7.5	0.36 B	0.43 U	0.35 U	NA	NA
Barium	300	2.9 B	1.9 B	2.2 B	NA	NA
Beryllium	0.16	NA	NA	0.18 U	NA	NA
Cadmium	1	0.032 U	0.043 U	0.035 U	NA	NA
Calcium	NE*	NA	NA	81.1	NA	NA
Chromium	10	2	2.6	1.4 B	NA	NA
Cobalt	30	NA	NA	0.46 B	NA	NA
Copper	25	NA	NA	2.7	NA	NA
Iron	2000	NA	NA	816	NA	NA
Lead	NE*	1.4	6.1	15	NA	NA
Magnesium	NE*	NA	NA	75.3	NA	NA
Manganese	NE*	NA	NA	21	NA	NA
Mercury	0.1	0.019 U	0.019 U	0.016 B	NA	NA
Nickel	13	NA	NA	0.6 B	NA	NA
Potassium	NE*	NA	NA	78.7 B	NA	NA
Selenium	2	0.32 U	0.95 B	0.61 B	NA	NA
Silver	NE*	0.57 B	0.22 U	0.18 U	NA	NA
Sodium	NE*	NA	NA	44.4 B	NA	NA
Thallium	NE*	NA	NA	0.26 U	NA	NA
Vanadium	150	NA	NA	1.4 B	NA	NA
Zinc	20	NA	NA	10.2	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.095 U	0.29 B	0.94	2	3.2
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	34 U	NA	NA
Aroclor 1254	1000/10000	NA	NA	34 U	NA	NA
Aroclor 1260	1000/10000	NA	NA	34 U	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	3.4 U	NA	NA
4,4'-DDE	2100	NA	NA	3.4 U	NA	NA
4,4'-DDT	2100	NA	NA	3.4 U	NA	NA
Aldrin	41	NA	NA	1.8 U	NA	NA
alpha-BHC	110	NA	NA	1.8 U	NA	NA
alpha-Chlordane	NE	NA	NA	1.8 U	NA	NA
beta-BHC	200	NA	NA	7	NA	NA
delta-BHC	300	NA	NA	7.1 P	NA	NA
Dieldrin	44	NA	NA	3.4 U	NA	NA
Endosulfan I	900	NA	NA	1.8 U	NA	NA
Endosulfan II	900	NA	NA	3.4 U	NA	NA
Endosulfan sulfate	1000	NA	NA	3.4 U	NA	NA
Endrin	100	NA	NA	3.4 U	NA	NA
Endrin aldehyde	NE	NA	NA	3.4 U	NA	NA
Endrin ketone	NE	NA	NA	3.4 U	NA	NA
gamma-Chlordane	540	NA	NA	1.8 U	NA	NA
Heptachlor	100	NA	NA	1.8 U	NA	NA
Heptachlor epoxide	20	NA	NA	1.8 U	NA	NA
Lindane	10	NA	NA	1.8 U	NA	NA
Methoxychlor	140	NA	NA	18 U	NA	NA
Toxaphene	NE	NA	NA	180 U	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	5 U
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	33 U
p-Cresol (TCLP)	NE	NA	NA	NA	NA	33 U
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	6.1 B
Barium (TCLP)	NE	NA	NA	NA	NA	33.9 B
Cadmium (TCLP)	NE	NA	NA	NA	NA	0.4 U
Chromium (TCLP)	NE	NA	NA	NA	NA	2 U
Lead (TCLP)	NE	NA	NA	NA	NA	10 B
Selenium (TCLP)	NE	NA	NA	NA	NA	6.4 B
Silver (TCLP)	NE	NA	NA	NA	NA	2 U

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-77	RPSB-78			RPSB-79
		8-10	4-6	6-8	8-10	8-10
		RPSB-77 (8-10)	RPSB-78 (4-6)	RPSB-78 (6-8)	RPSB-78 (8-10)	RPSB-79 (8-10)
		02/28/2000	02/29/2000	02/29/2000	02/29/2000	03/01/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.002	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.002	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001	0.002	0.001 U
Total BTEX		0	0	0.001	0.006	0
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	5 U	NA	5 U
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	5 U	NA	5 U
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	5 U	NA	5 U
Trichloroethene	700	NA	NA	5 U	NA	5 U
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.41 U	0.38 U	**0.42**	1.7 U	3.4 U
Benzo(a)pyrene	0.061	0.41 U	0.38 U	**0.29 J**	1.7 U	3.4 U
Benzo(b)fluoranthene	1.1	0.41 U	0.38 U	1	1.7 U	3.4 U
Benzo(k)fluoranthene	1.1	0.41 U	0.38 U	0.27 J	1.7 U	3.4 U
Chrysene	0.4	0.41 U	0.38 U	**0.82**	1.7 U	3.4 U
Dibenzo(a,h)anthracene	0.014	0.41 U	0.38 U	**0.15 J**	1.7 U	3.4 U
Indeno(1,2,3-cd)pyrene	3.2	0.41 U	0.38 U	0.55	1.7 U	3.4 U
Total Carcinogenic PAHs		0	0	3.5	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.41 U	0.38 U	0.087 J	1.7 U	3.4 U
Acenaphthene	50	0.41 U	0.38 U	0.34 U	1.7 U	3.4 U
Acenaphthylene	41	0.41 U	0.38 U	0.42	1.7 U	3.4 U
Anthracene	50	0.41 U	0.38 U	0.14 J	1.7 U	3.4 U
Benzo(g,h,i)perylene	50	0.41 U	0.38 U	0.45	1.7 U	3.4 U
Fluoranthene	50	0.41 U	0.38 U	0.57	1.7 U	3.4 U
Fluorene	50	0.41 U	0.38 U	0.34 U	1.7 U	3.4 U
Naphthalene	13	0.41 U	0.38 U	0.13 J	1.7 U	3.4 U
Phenanthrene	50	0.41 U	0.38 U	0.52	1.7 U	3.4 U
Pyrene	50	0.41 U	0.38 U	1.3	1.7 U	3.4 U
Total Non-Carcinogenic PAHs		0	0	3.617	0	0
Total PAHs		0	0	7.117	0	0
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	33 U	NA	33 U
2-Methylphenol	100	NA	NA	33 U	NA	33 U
4-Methylphenol	900	NA	NA	33 U	NA	33 U
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	410 U	380 U	35 J	1700 U	3400 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-77	RPSB-78			RPSB-79
		8-10 RPSB-77 (8-10) 02/28/2000	4-6 RPSB-78 (4-6) 02/29/2000	6-8 RPSB-78 (6-8) 02/29/2000	8-10 RPSB-78 (8-10) 02/29/2000	8-10 RPSB-79 (8-10) 03/01/2000
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.63 B	0.17 U	2.4	0.43 B	0.15 U
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	0.33 U	NA	0.33 U
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	0.17 U	NA	0.17 U
Heptachlor epoxide	20	NA	NA	0.17 U	NA	0.17 U
Lindane	10	NA	NA	0.17 U	NA	0.17 U
Methoxychlor	140	NA	NA	1.7 U	NA	1.7 U
Toxaphene	NE	NA	NA	17 U	NA	17 U
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	5 U	NA	5 U
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	33 U	NA	33 U
p-Cresol (TCLP)	NE	NA	NA	33 U	NA	33 U
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	3 U	NA	3 U
Barium (TCLP)	NE	NA	NA	22.8 B	NA	115 B
Cadmium (TCLP)	NE	NA	NA	2 U	NA	2 U
Chromium (TCLP)	NE	NA	NA	2 U	NA	2 U
Lead (TCLP)	NE	NA	NA	18.5	NA	3.1 B
Selenium (TCLP)	NE	NA	NA	4.3 B	NA	4 U
Silver (TCLP)	NE	NA	NA	3.2 B	NA	3 U

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-79	RPSB-80			RPSB-81
		10-12	4-6	6-8	8-10	4-6
		RPSB-79 (10-12)	RPSB-80 (4-6)	RPSB-80 (6-8)	RPSB-80 (8-10)	RPSB-81 (4-6)
		03/01/2000	03/01/2000	03/01/2000	03/01/2000	03/01/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.03	**0.14**	1.3 U	**0.24**
Ethyl benzene	5.5	0.077	0.013	0.4	**33**	0.005 U
Toluene	1.5	0.003	0.013	0.14	**3.2**	0.059
Xylene (total)	1.2	0.19	0.016	0.5	**100**	0.008
Total BTEX		0.27	0.072	1.18	136.2	0.307
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	5 U	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	5 U	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	5 U	NA	NA
Trichloroethene	700	NA	NA	5 U	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	3.4 U	1.8 U	**0.53 J**	**0.68 J**	**1.1 J**
Benzo(a)pyrene	0.061	**14**	1.8 U	**0.47 J**	**0.65 J**	**0.97 J**
Benzo(b)fluoranthene	1.1	**5.7**	1.8 U	**1.1 J**	0.8 J	**1.6 J**
Benzo(k)fluoranthene	1.1	0.83 J	1.8 U	0.33 J	0.3 J	0.43 J
Chrysene	0.4	**1.1 J**	1.8 U	**0.72 J**	**0.7 J**	**1.3 J**
Dibenzo(a,h)anthracene	0.014	**2.2 J**	1.8 U	1.8 U	1.7 U	3.5 U
Indeno(1,2,3-cd)pyrene	3.2	**12**	1.8 U	0.42 J	1.7 U	3.5 U
Total Carcinogenic PAHs		35.83	0	3.57	3.13	5.4
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	3.4 U	1.8 U	0.62 J	1.6 J	3.5 U
Acenaphthene	50	3.4 U	1.8 U	1.8 U	1.7 U	3.5 U
Acenaphthylene	41	6	1.8 U	0.39 J	0.42 J	0.68 J
Anthracene	50	1.3 J	1.8 U	1.8 U	1.7 U	0.44 J
Benzo(g,h,i)perylene	50	13	1.8 U	0.46 J	0.34 J	3.5 U
Fluoranthene	50	3.4 U	1.8 U	1 J	0.58 J	1.3 J
Fluorene	50	3.4 U	1.8 U	1.8 U	0.2 J	3.5 U
Naphthalene	13	3.4 U	1.8 U	12	9	0.48 J
Phenanthrene	50	3.4 U	1.8 U	0.8 J	0.42 J	1.4 J
Pyrene	50	3.4 U	1.8 U	1.3 J	2.8	2.8 J
Total Non-Carcinogenic PAHs		20.3	0	16.57	15.36	7.1
Total PAHs		56.13	0	20.14	18.49	12.5
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	33 U	NA	NA
2-Methylphenol	100	NA	NA	33 U	NA	NA
4-Methylphenol	900	NA	NA	33 U	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	3400 U	1800 U	1800 U	1700 U	3500 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-79	RPSB-80			RPSB-81
		10-12 RPSB-79 (10-12) 03/01/2000	4-6 RPSB-80 (4-6) 03/01/2000	6-8 RPSB-80 (6-8) 03/01/2000	8-10 RPSB-80 (8-10) 03/01/2000	4-6 RPSB-81 (4-6) 03/01/2000
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.12 U	0.66 B	0.99	0.12 U	5.1
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	0.33 U	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	0.17 U	NA	NA
Heptachlor epoxide	20	NA	NA	0.17 U	NA	NA
Lindane	10	NA	NA	0.17 U	NA	NA
Methoxychlor	140	NA	NA	1.7 U	NA	NA
Toxaphene	NE	NA	NA	17 U	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	17	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	33 U	NA	NA
p-Cresol (TCLP)	NE	NA	NA	33 U	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	3 U	NA	NA
Barium (TCLP)	NE	NA	NA	129 B	NA	NA
Cadmium (TCLP)	NE	NA	NA	2 U	NA	NA
Chromium (TCLP)	NE	NA	NA	2 U	NA	NA
Lead (TCLP)	NE	NA	NA	11.6	NA	NA
Selenium (TCLP)	NE	NA	NA	4 U	NA	NA
Silver (TCLP)	NE	NA	NA	3 U	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-81		RPSB-82		
		6-8 RPSB-81 (6-8) 03/01/2000	8-10 RPSB-81 (8-10) 03/01/2000	4-6 RPSB-82 (4-6) 03/02/2000	6-8 RPSB-82 (6-8) 03/02/2000	8-10 RPSB-82 (8-10) 03/02/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.05	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.01 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.08	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.029	0.001 U	0.001 U
Total BTEX		0	0	0.159	0	0
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	5 U	NA	NA	5 U	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	5 U	NA	NA	5 U	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1400	5 U	NA	NA	5 U	NA
Trichloroethene	700	5 U	NA	NA	5 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.34 U	0.39 U	0.12 J	0.39 U	0.39 U
Benzo(a)pyrene	0.061	0.34 U	0.39 U	**0.094 J**	0.39 U	0.39 U
Benzo(b)fluoranthene	1.1	0.34 U	0.39 U	0.13 J	0.39 U	0.39 U
Benzo(k)fluoranthene	1.1	0.34 U	0.39 U	0.067 J	0.39 U	0.39 U
Chrysene	0.4	0.34 U	0.39 U	0.15 J	0.39 U	0.39 U
Dibenzo(a,h)anthracene	0.014	0.34 U	0.39 U	0.34 U	0.39 U	0.39 U
Indeno(1,2,3-cd)pyrene	3.2	0.34 U	0.39 U	0.063 J	0.39 U	0.39 U
Total Carcinogenic PAHs		0	0	0.624	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.34 U	0.39 U	0.34 U	0.39 U	0.39 U
Acenaphthene	50	0.34 U	0.39 U	0.34 U	0.39 U	0.39 U
Acenaphthylene	41	0.34 U	0.39 U	0.34 U	0.39 U	0.39 U
Anthracene	50	0.34 U	0.39 U	0.34 U	0.39 U	0.39 U
Benzo(g,h,i)perylene	50	0.34 U	0.39 U	0.058 J	0.39 U	0.39 U
Fluoranthene	50	0.34 U	0.39 U	0.22 J	0.39 U	0.39 U
Fluorene	50	0.34 U	0.39 U	0.34 U	0.39 U	0.39 U
Naphthalene	13	0.079 J	0.39 U	0.56	0.39 U	0.39 U
Phenanthrene	50	0.34 U	0.39 U	0.078 J	0.39 U	0.39 U
Pyrene	50	0.34 U	0.39 U	0.16 J	0.39 U	0.39 U
Total Non-Carcinogenic PAHs		0.079	0	1.076	0	0
Total PAHs		0.079	0	1.7	0	0
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	2900	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	33 U	NA	NA	33 U	NA
2-Methylphenol	100	33 U	NA	NA	33 U	NA
4-Methylphenol	900	33 U	NA	NA	33 U	NA
Benzene, hydroxy-	NE	NA	NA	12000	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	340 U	390 U	340 U	390 U	390 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSB-81		RPSB-82		
		6-8 RPSB-81 (6-8) 03/01/2000	8-10 RPSB-81 (8-10) 03/01/2000	4-6 RPSB-82 (4-6) 03/02/2000	6-8 RPSB-82 (6-8) 03/02/2000	8-10 RPSB-82 (8-10) 03/02/2000
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.14 U	0.21 U	0.33 B	0.25 B	0.21 U
PCBs (ug/kg)						
Aroclor 1242	1000/10000	NA	NA	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	0.33 U	NA	NA	0.33 U	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	0.17 U	NA	NA	0.17 U	NA
Heptachlor epoxide	20	0.17 U	NA	NA	0.17 U	NA
Lindane	10	0.17 U	NA	NA	0.17 U	NA
Methoxychlor	140	1.7 U	NA	NA	1.7 U	NA
Toxaphene	NE	17 U	NA	NA	17 U	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	5 U	NA	NA	5 U	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	33 U	NA	NA	33 U	NA
p-Cresol (TCLP)	NE	33 U	NA	NA	33 U	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	3 U	NA	NA	4 U	NA
Barium (TCLP)	NE	74.7 B	NA	NA	10 B	NA
Cadmium (TCLP)	NE	2 U	NA	NA	0.4 U	NA
Chromium (TCLP)	NE	2 U	NA	NA	2 U	NA
Lead (TCLP)	NE	7 B	NA	NA	17.7	NA
Selenium (TCLP)	NE	5 B	NA	NA	4.5 B	NA
Silver (TCLP)	NE	3 U	NA	NA	2 U	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-98	RPSB-98A	RPSB-99
		4-6	6-8	6-8
		RPSB-98 (4-6)	RPSB-98A (6-8)	RPSB-99 (6-8)
		11/07/2001	11/09/2001	11/14/2001
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.001	0.001 U	0.036
Ethyl benzene	5.5	0.004	0.001 U	0.041
Toluene	1.5	0.001 U	0.001	0.059
Xylene (total)	1.2	0.016	0.001 U	0.066
Total BTEX		0.021	0.001	0.202
Other Volatile Organic Compounds (ug/kg)				
1,2,3-Trichlorobenzene	NE	NA	NA	NA
2-Butanone	300	NA	NA	NA
2-Hexanone	NE	NA	NA	NA
Acetone	200	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA
Methylene chloride	100	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA
Styrene	NE	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA
Trichloroethene	700	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.38 U	0.1 J	**0.28 J**
Benzo(a)pyrene	0.061	0.38 U	**0.19 J**	**0.38**
Benzo(b)fluoranthene	1.1	0.38 U	0.2 J	0.66
Benzo(k)fluoranthene	1.1	0.38 U	0.091 J	0.31 J
Chrysene	0.4	0.38 U	0.11 J	**0.4**
Dibenzo(a,h)anthracene	0.014	0.38 U	0.41 U	0.35 U
Indeno(1,2,3-cd)pyrene	3.2	0.38 U	0.16 J	0.32 J
Total Carcinogenic PAHs		0	0.851	2.35
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.38 U	0.41 U	0.24 J
Acenaphthene	50	0.38 U	0.41 U	0.098 J
Acenaphthylene	41	0.38 U	0.4 J	0.58
Anthracene	50	0.38 U	0.11 J	0.16 J
Benzo(g,h,i)perylene	50	0.38 U	0.18 J	0.3 J
Fluoranthene	50	0.38 U	0.13 J	0.37
Fluorene	50	0.38 U	0.071 J	0.12 J
Naphthalene	13	0.38 U	0.16 J	0.48
Phenanthrene	50	0.38 U	0.12 J	0.26 J
Pyrene	50	0.38 U	0.17 J	0.46
Total Non-Carcinogenic PAHs		0	1.341	3.068
Total PAHs		0	2.192	5.418
Other Semivolatile Organic Compounds (ug/kg)				
1,2-Dichlorobenzene	2900	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA
2-Methylphenol	100	NA	NA	NA
4-Methylphenol	900	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA
Carbazole	NA	NA	NA	NA
Dibenzofuran	6200	380 U	54 J	350 U
Di-n-butylphthalate	8100	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA
p-Cymene	NE	NA	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-98	RPSB-98A	RPSB-99
		4-6	6-8	6-8
		RPSB-98 (4-6)	RPSB-98A (6-8)	RPSB-99 (6-8)
		11/07/2001	11/09/2001	11/14/2001
Metals (mg/kg)				
Aluminum	NE*	NA	NA	NA
Antimony	NE*	NA	NA	NA
Arsenic	7.5	NA	NA	NA
Barium	300	NA	NA	NA
Beryllium	0.16	NA	NA	NA
Cadmium	1	NA	NA	NA
Calcium	NE*	NA	NA	NA
Chromium	10	NA	NA	NA
Cobalt	30	NA	NA	NA
Copper	25	NA	NA	NA
Iron	2000	NA	NA	NA
Lead	NE*	NA	NA	NA
Magnesium	NE*	NA	NA	NA
Manganese	NE*	NA	NA	NA
Mercury	0.1	NA	NA	NA
Nickel	13	NA	NA	NA
Potassium	NE*	NA	NA	NA
Selenium	2	NA	NA	NA
Silver	NE*	NA	NA	NA
Sodium	NE*	NA	NA	NA
Thallium	NE*	NA	NA	NA
Vanadium	150	NA	NA	NA
Zinc	20	NA	NA	NA
Total Cyanide (mg/kg)				
Cyanide, total	NE	7 U	1.6	0.38 B
PCBs (ug/kg)				
Aroclor 1242	1000/10000	NA	NA	NA
Aroclor 1254	1000/10000	NA	NA	NA
Aroclor 1260	1000/10000	NA	NA	NA
Pesticides (ug/kg)				
4,4'-DDD	2900	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA
Aldrin	41	NA	NA	NA
alpha-BHC	110	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA
beta-BHC	200	NA	NA	NA
delta-BHC	300	NA	NA	NA
Dieldrin	44	NA	NA	NA
Endosulfan I	900	NA	NA	NA
Endosulfan II	900	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA
Endrin	100	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA
Endrin ketone	NE	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA
Heptachlor	100	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA
Lindane	10	NA	NA	NA
Methoxychlor	140	NA	NA	NA
Toxaphene	NE	NA	NA	NA
TCLP				
TCLP Benzene (ug/l)				
Benzene (TCLP)	NE	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)				
o-Cresol (TCLP)	NE	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA
TCLP Metals (ug/l)				
Arsenic (TCLP)	NE	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA

Table 4-28 (continued)
Soil Analytical Results
South and East Adjacent Areas (0-12 feet)
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-29
Soil Analytical Results
South and East Adjacent Areas (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPGP-26	RPGP-27	RPSB-101	RPSB-127	
		20-24	12-16	15-17	14.5-17	21-23
		RPGP-26 (20-24)	RPGP-27 (12-16)	RPSB-101 (15-17)	RSB-127 (14.5-17)	RPSB-127 (21-23)
		07/19/2002	07/23/2002	11/15/2001	08/26/2002	08/26/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	**0.067**	0.001 U	**0.2 J**	0.001 J
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.011	0.001 U
Ethyl benzene	5.5	0.001 U	0.035	0.001 U	0.11	0.002
Xylene (total)	1.2	0.001 U	0.05	0.001 U	0.063	0.001 U
Total BTEX		0	0.152	0	0.384	0.003
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Benzo(a)pyrene	0.061	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Benzo(b)fluoranthene	1.1	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Benzo(k)fluoranthene	1.1	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Chrysene	0.4	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Dibenzo(a,h)anthracene	0.014	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Acenaphthene	50	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Acenaphthylene	41	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Anthracene	50	0.42 UJ	0.4 U	0.33 U	0.41 UJ	0.37 U
Benzo(g,h,i)perylene	50	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Fluoranthene	50	0.42 UJ	0.4 U	0.33 U	0.41 UJ	0.37 U
Fluorene	50	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Naphthalene	13	0.42 U	0.4 U	0.33 U	0.41 UJ	0.37 U
Phenanthrene	50	0.42 UJ	0.4 U	0.037 J	0.41 UJ	0.37 U
Pyrene	50	0.42 U	0.4 UJ	0.33 U	0.41 UJ	0.37 U
Total Non-Carcinogenic PAHs		0	0	0.037	0	0
Total PAHs		0	0	0.037	0	0
Other Semivolatile Organic Compounds (ug/kg)						
Dibenzofuran	6200	420 U	400 U	330 U	410 UJ	370 U
Metals (mg/kg)						
Arsenic	7.5	NA	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	NA	NA	0.80 B	0.3 U	0.24 U

Table 4-29 (continued)
Soil Analytical Results
South and East Adjacent Areas (12-24 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSB-57	RPSB-60	RPSB-63	RPSB-98A
		15-17	15-17	15-17	18-20
		RPSB-57 (15-17)	RPSB-60 (15-17)	RPSB-63 (15-17)	RPSB-98A (18-20)
		02/24/2000	02/07/2000	02/23/2000	11/09/2001
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.002
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.002
Xylene (total)	1.2	0.001 U	0.004	0.001 U	0.001
Total BTEX		0	0.004	0	0.005
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	0.42 U	0.38 U	0.39 U	0.37 U
Benzo(a)pyrene	0.061	0.42 U	0.38 U	0.39 U	0.37 U
Benzo(b)fluoranthene	1.1	0.42 U	0.38 U	0.39 U	0.37 U
Benzo(k)fluoranthene	1.1	0.42 U	0.38 U	0.39 U	0.37 U
Chrysene	0.4	0.42 U	0.38 U	0.39 U	0.37 U
Dibenzo(a,h)anthracene	0.014	0.42 U	0.38 U	0.39 U	0.37 U
Indeno(1,2,3-cd)pyrene	3.2	0.42 U	0.38 U	0.39 U	0.37 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.42 U	0.11 J	0.39 U	0.37 U
Acenaphthene	50	0.42 U	0.074 J	0.39 U	0.37 U
Acenaphthylene	41	0.42 U	0.051 J	0.39 U	0.37 U
Anthracene	50	0.42 U	0.38 U	0.39 U	0.37 U
Benzo(g,h,i)perylene	50	0.42 U	0.38 U	0.39 U	0.37 U
Fluoranthene	50	0.42 U	0.38 U	0.39 U	0.37 U
Fluorene	50	0.42 U	0.38 U	0.39 U	0.37 U
Naphthalene	13	0.42 U	0.38 U	0.39 U	0.37 U
Phenanthrene	50	0.42 U	0.1 J	0.39 U	0.37 U
Pyrene	50	0.42 U	0.04 J	0.39 U	0.37 U
Total Non-Carcinogenic PAHs		0	0.375	0	0
Total PAHs		0	0.375	0	0
Other Semivolatile Organic Compounds (ug/kg)					
Dibenzofuran	6200	420 U	380 U	390 U	370 U
Metals (mg/kg)					
Arsenic	7.5	0.65 B	0.55 B	0.39 U	NA
Barium	300	2.8 B	0.95 B	1.7 B	NA
Cadmium	1	0.13 B	0.22 U	0.072 B	NA
Chromium	10	2.2 B	1.2 B	1.1 B	NA
Lead	NE*	2	0.38 B	0.89 B	NA
Mercury	0.1	0.019 U	0.015 U	0.02 U	NA
Selenium	2	0.49 U	0.43 U	0.39 U	NA
Silver	NE*	0.24 U	0.32 U	0.2 U	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	0.18 B	0.073 B	0.12 B	7 U

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-30
Soil Analytical Results
South and East Adjacent Areas (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPGP-27	RPMW-16I	RPSB-100	RPSB-101	RPSB-102	RPSB-57
		36-40	39-41	36-38	39-41	29-31	40-42
		RPGP-27 (36-40)	RPMW-16I (39-41)	RPSB-100 (36-38)	RPSB-101 (39-41)	RPSB-102 (29-31)	RPSB-57 (40-42)
		07/25/2002	10/24/2002	11/08/2001	11/15/2001	11/28/2001	02/24/2000
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.002	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0	0	0.002	0	0	0
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Benzo(a)pyrene	0.061	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Benzo(b)fluoranthene	1.1	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Benzo(k)fluoranthene	1.1	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Chrysene	0.4	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Dibenzo(a,h)anthracene	0.014	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Indeno(1,2,3-cd)pyrene	3.2	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Total Carcinogenic PAHs		NA	0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Acenaphthene	50	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Acenaphthylene	41	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Anthracene	50	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Benzo(g,h,i)perylene	50	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Fluoranthene	50	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Fluorene	50	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Naphthalene	13	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Phenanthrene	50	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Pyrene	50	NA	0.41 U	0.4 U	0.32 U	0.42 U	0.4 U
Total Non-Carcinogenic PAHs		NA	0	0	0	0	0
Total PAHs		NA	0	0	0	0	0
Other Semivolatile Organic Compounds (ug/kg)							
Dibenzofuran	6200	NA	410 U	400 U	320 U	420 U	400 U
Metals (mg/kg)							
Arsenic	7.5	NA	NA	NA	NA	NA	0.88 B
Barium	300	NA	NA	NA	NA	NA	2 B
Cadmium	1	NA	NA	NA	NA	NA	0.097 B
Chromium	10	NA	NA	NA	NA	NA	2.1 B
Lead	NE*	NA	NA	NA	NA	NA	1
Mercury	0.1	NA	NA	NA	NA	NA	0.02 U
Selenium	2	NA	NA	NA	NA	NA	0.47 U
Silver	NE*	NA	NA	NA	NA	NA	0.23 U
Total Cyanide (mg/kg)							
Cyanide	NE	NA	0.29 U	7 U	0.41 U	0.30 U	0.093 U

Table 4-30 (continued)
Soil Analytical Results
South and East Adjacent Areas (24-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date					
		RPSB-58	RPSB-59	RPSB-60	RPSB-62	RPSB-98	RPSB-99
		40-42	40-42	40-42	40-42	38-40	38-40
		RPSB-58 (40-42)	RPSB-59 (40-42)	RPSB-60 (40-42)	RPSB-62 (40-42)	RPSB-98 (38-40)	RPSB-99 (38-40)
		01/31/2000	02/15/2000	02/07/2000	02/11/2000	11/08/2001	11/14/2001
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.003	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.012	0.001 U	0.003	0.001 U	0.002	0.004
Ethyl benzene	5.5	0.008 J	0.001 U	0.001 U	0.001 U	0.001 U	0.002
Xylene (total)	1.2	0.009	0.001 U	0.012	0.003	0.001 U	0.006
Total BTEX		0.032	0	0.015	0.003	0.002	0.012
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	0.053 J	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Benzo(a)pyrene	0.061	0.4 U	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Benzo(b)fluoranthene	1.1	0.4 U	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Benzo(k)fluoranthene	1.1	0.4 U	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Chrysene	0.4	0.07 J	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Dibenzo(a,h)anthracene	0.014	0.4 U	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Indeno(1,2,3-cd)pyrene	3.2	0.4 U	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Total Carcinogenic PAHs		0.123	0	0	0	0	0
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.4 U	0.45 U	0.067 J	0.41 U	0.4 U	0.42 U
Acenaphthene	50	0.047 J	0.45 U	0.054 J	0.41 U	0.4 U	0.42 U
Acenaphthylene	41	0.06 J	0.45 U	0.048 J	0.41 U	0.4 U	0.42 U
Anthracene	50	0.064 J	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Benzo(g,h,i)perylene	50	0.4 U	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Fluoranthene	50	0.14 J	0.45 U	0.04 J	0.41 U	0.4 U	0.42 U
Fluorene	50	0.081 J	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Naphthalene	13	0.4 U	0.45 U	0.41 U	0.41 U	0.4 U	0.42 U
Phenanthrene	50	0.44	0.07 J	0.13 J	0.41 U	0.4 U	0.42 U
Pyrene	50	0.2 J	0.45 U	0.056 J	0.41 U	0.4 U	0.42 U
Total Non-Carcinogenic PAHs		1.032	0.07	0.395	0	0	0
Total PAHs		1.155	0.07	0.395	0	0	0
Other Semivolatile Organic Compounds (ug/kg)							
Dibenzofuran	6200	400 U	450 U	410 U	410 U	400 U	420 U
Metals (mg/kg)							
Arsenic	7.5	0.54 B	1.3 B	0.72 B	0.39 U	NA	NA
Barium	300	1.7 B	2.3 B	1.6 B	1.7 B	NA	NA
Cadmium	1	0.22 U	0.043 U	0.23 U	0.039 U	NA	NA
Chromium	10	2.7	1.8 B	2.5	1.8 B	NA	NA
Lead	NE*	0.56 B	0.55 B	0.6 B	0.69 B	NA	NA
Mercury	0.1	0.019 U	0.02 U	0.021 U	0.018 U	NA	NA
Selenium	2	0.44 U	0.64 B	0.46 U	0.39 U	NA	NA
Silver	NE*	0.33 U	0.33 B	0.35 U	0.19 U	NA	NA
Total Cyanide (mg/kg)							
Cyanide	NE	0.13 B	0.22 B	0.056 B	0.13 U	7 U	3.3

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons.

Table 4-31
Soil Analytical Results
South and East Adjacent Areas (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date		
		RPSB-127	RPSB-61	RPSB-63
		57-67	55-57	45-47
		RPSB-127 (57-67)	RPSB-61 (55-57)	RPSB-63 (45-47)
		08/26/2002	02/10/2000	02/23/2000
Volatile Organic Compounds (VOCs)				
BTEX (mg/kg)				
Benzene	0.06	0.002 J	0.001 U	0.001 U
Toluene	1.5	0.002	0.002	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 U	0.006	0.001 U
Total BTEX		0.004	0.008	0
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHs (mg/kg)				
Benzo(a)anthracene	0.224	0.39 U	0.4 U	0.38 U
Benzo(a)pyrene	0.061	0.39 U	0.4 U	0.38 U
Benzo(b)fluoranthene	1.1	0.39 U	0.4 U	0.38 U
Benzo(k)fluoranthene	1.1	0.39 U	0.4 U	0.38 U
Chrysene	0.4	0.39 U	0.4 U	0.38 U
Dibenzo(a,h)anthracene	0.014	0.39 U	0.4 U	0.38 U
Indeno(1,2,3-cd)pyrene	3.2	0.39 U	0.4 U	0.38 U
Total Carcinogenic PAHs		0	0	0
Non-Carcinogenic PAHs (mg/kg)				
2-Methylnaphthalene	36.4	0.39 U	0.4 U	0.38 U
Acenaphthene	50	0.39 U	0.4 U	0.38 U
Acenaphthylene	41	0.39 U	0.4 U	0.38 U
Anthracene	50	0.39 U	0.4 U	0.38 U
Benzo(g,h,i)perylene	50	0.39 U	0.4 U	0.38 U
Fluoranthene	50	0.39 U	0.4 U	0.38 U
Fluorene	50	0.39 U	0.4 U	0.38 U
Naphthalene	13	0.39 U	0.4 U	0.38 U
Phenanthrene	50	0.39 U	0.066 J	0.38 U
Pyrene	50	0.39 U	0.4 U	0.38 U
Total Non-Carcinogenic PAHs		0	0.066	0
Total PAHs		0	0.066	0
Other Semivolatile Organic Compounds (ug/kg)				
Dibenzofuran	6200	390 U	400 U	380 U
Metals (mg/kg)				
Arsenic	7.5	NA	0.5 B	0.47 U
Barium	300	NA	1 B	2 B
Cadmium	1	NA	0.043 B	0.1 B
Chromium	10	NA	1.4 B	2.3 B
Lead	NE*	NA	0.41 B	0.96
Mercury	0.1	NA	0.02 U	0.019 U
Selenium	2	NA	0.68 B	0.47 U
Silver	NE*	NA	0.25 B	0.23 U
Total Cyanide (mg/kg)				
Cyanide	NE	0.28 U	0.069 U	0.096 U

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-32
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSS-05	RPSS-06	RPSS-07	RPSS-08	RPSS-09
		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
		RPSS-05 (0-6")	RPSS-06 (0-6")	RPSS-07 (0-6")	RPSS-08 (0-6")	RPSS-09 (0-6")
		01/04/2000	01/04/2000	01/04/2000	01/04/2000	01/04/2000
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.003	0.001 U	0.001 U	0.001 U	0.001 U
Total BTEX		0.003	0.001	0	0	0
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**0.34 J**	**0.31 J**	**2.4 J**	**7.5**	**5.6**
Benzo(a)pyrene	0.061	**0.38 J**	**0.24 J**	**1.7 J**	**7.8**	**5.2**
Benzo(b)fluoranthene	1.1	0.46 J	0.26 J	**2 J**	**10**	**7.8**
Benzo(k)fluoranthene	1.1	0.66 J	0.24 J	**1.2 J**	**3.4 J**	**2.4 J**
Chrysene	0.4	**0.66 J**	0.35 J	**2.4 J**	**7.6**	**7.4**
Dibenzo(a,h)anthracene	0.014	3.3 U	**0.054 J**	**0.49 J**	**1.6 J**	**1.6 J**
Indeno(1,2,3-cd)pyrene	3.2	0.29 J	0.19 J	1.5 J	**5.9**	**4**
Total Carcinogenic PAHs		2.79	1.644	11.69	43.8	34
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.44 J	0.037 J	0.48 J	0.79 J	0.54 J
Acenaphthene	50	3.3 U	0.35 U	3.7 U	3.5 U	3.6 U
Acenaphthylene	41	3.3 U	0.097 J	1.9 J	5.7	1.9 J
Anthracene	50	3.3 U	0.093 J	0.94 J	2.6 J	2 J
Benzo(g,h,i)perylene	50	3.3 U	0.22 J	1.9 J	8	6.3
Fluoranthene	50	1 J	0.52	2.2 J	8.6	8.4
Fluorene	50	3.3 U	0.35 U	3.7 U	0.66 J	0.95 J
Naphthalene	13	3.3 U	0.083 J	0.58 J	0.88 J	1.3 J
Phenanthrene	50	0.83 J	0.26 J	1.1 J	3.7	12
Pyrene	50	0.86 J	0.6	4.7	14	13
Total Non-Carcinogenic PAHs		3.13	1.91	13.8	44.93	46.39
Total PAHs		5.92	3.554	25.49	88.73	80.39
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	11000 U	11000 U	11000 U	11000 U	11000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	3300 U	350 U	3700 U	3500 U	3600 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSS-05	RPSS-06	RPSS-07	RPSS-08	RPSS-09
		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
		RPSS-05 (0-6")	RPSS-06 (0-6")	RPSS-07 (0-6")	RPSS-08 (0-6")	RPSS-09 (0-6")
		01/04/2000	01/04/2000	01/04/2000	01/04/2000	01/04/2000
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	1.5 B	2.9	2.2	7.1	**12.7**
Barium	300	42.2	38.2	23.5	87.5	47.8
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	0.9	5.8	0.59	**1.7**	**1.3**
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	7.3	10.6	4.7	9.7	7.5
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	13.9	57.6	69	118	105
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	0.021 B	**0.16**	0.079	**0.12**	0.78
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	0.41 U	0.38 U	0.36 U	0.78 B	0.54 B
Silver	NE*	2.2 B	2.1 B	1.2 B	3.5	2.3 B
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.13 B	0.3 B	1.4	2.5	0.52 B
PCBs (ug/kg)						
Aroclor 1242	1000	NA	NA	NA	NA	NA
Aroclor 1254	1000	NA	NA	NA	NA	NA
Aroclor 1260	1000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	2900	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSS-11	RPSS-12	RPSS-13	RPSS-14	SS-01A
		0-0.5	0-0.5	0-0.5	0-0.5	0.25
		RPSS-11 (0-6")	RPSS-12 (0-6")	RPSS-13 (0-6")	RPSS-14 (0-6")	NYHS-S1
		01/04/2000	01/04/2000	01/04/2000	01/04/2000	07/11/1989
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.01 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.01 U
Toluene	1.5	0.001 U	0.001 U	0.001 U	0.001 U	0.01 U
Xylene (total)	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.01 U
Total BTEX		0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	20 U
2-Hexanone	NE	NA	NA	NA	NA	20 U
Acetone	200	NA	NA	NA	NA	20 U
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA	10 U
Chlorobenzene	1700	NA	NA	NA	NA	10 U
Methylene chloride	100	NA	NA	NA	NA	10 U
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	10 U
Tetrachloroethene	1400	NA	NA	NA	NA	10 U
Trichloroethene	700	NA	NA	NA	NA	10 U
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**2.7 J**	**2.4**	**1.6**	**1.9 J**	**1.2 J**
Benzo(a)pyrene	0.061	**2 J**	**2.4**	**1.2**	**1.6 J**	**2.1 J**
Benzo(b)fluoranthene	1.1	**2.5 J**	**3.2**	**1.4**	**2 J**	**2 J**
Benzo(k)fluoranthene	1.1	1 J	1	0.61	0.88 J	**1.8 J**
Chrysene	0.4	**3.3 J**	**2.3**	**1.5**	**1.7 J**	**1.1 J**
Dibenzo(a,h)anthracene	0.014	**0.45 J**	0.36 U	**0.24 J**	3.5 U	3.5 U
Indeno(1,2,3-cd)pyrene	3.2	1.4 J	1.8	0.87	1.4 J	0.78 J
Total Carcinogenic PAHs		13.35	13.1	7.42	9.48	8.98
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	3.6 U	0.1 J	0.1 J	3.5 U	3.5 U
Acenaphthene	50	3.6 U	0.16 J	0.36 U	3.5 U	3.5 U
Acenaphthylene	41	1.7 J	0.8	0.74	1.5 J	3.5 U
Anthracene	50	0.92 J	0.62	0.46	0.78 J	3.5 U
Benzo(g,h,i)perylene	50	1.7 J	1.9	0.99	1.6 J	0.8 J
Fluoranthene	50	3.5 J	3.8	2.1	2.5 J	1.8 J
Fluorene	50	3.6 U	0.16 J	0.14 J	3.5 U	3.5 U
Naphthalene	13	0.55 J	0.13 J	0.1 J	0.74 J	3.5 U
Phenanthrene	50	2.3 J	1.7	1.2	1.4 J	0.6 J
Pyrene	50	5.8	4	2.9	3.9	1.5 J
Total Non-Carcinogenic PAHs		16.47	13.37	8.73	12.42	4.7
Total PAHs		29.82	26.47	16.15	21.9	13.68
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	3500 U
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA	3500 U
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	3500 U
2-Methylphenol	1000	NA	NA	NA	NA	3500 U
4-Methylphenol	900	NA	NA	NA	NA	3500 U
Benzene, hydroxy-	NE	11000 U	11000 U	11000 U	11000 U	3500 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	3500 U
Butylbenzylphthalate	50000	NA	NA	NA	NA	3500 U
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	3600 U	61 J	360 U	3500 U	3500 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	3500 U
Di-n-octylphthalate	50000	NA	NA	NA	NA	3500 U
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	3500 U
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		RPSS-11	RPSS-12	RPSS-13	RPSS-14	SS-01A
		0-0.5	0-0.5	0-0.5	0-0.5	0.25
		RPSS-11 (0-6")	RPSS-12 (0-6")	RPSS-13 (0-6")	RPSS-14 (0-6")	NYHS-S1
		01/04/2000	01/04/2000	01/04/2000	01/04/2000	07/11/1989
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	2940.00
Antimony	NE*	NA	NA	NA	NA	10
Arsenic	7.5	2.8	2.7	2.6	2.2	1.40
Barium	300	44.3	38.7	87	24.3	19.50
Beryllium	0.16	NA	NA	NA	NA	0.15
Cadmium	1	0.67	0.71	0.86	0.53	0.7
Calcium	NE*	NA	NA	NA	NA	9110.00
Chromium	10	5.7	6.4	7.1	**14.5**	5.70
Cobalt	30	NA	NA	NA	NA	2.00
Copper	25	NA	NA	NA	NA	11.40
Iron	2000	NA	NA	NA	NA	**5130.00**
Lead	NE*	135	91.2	189	90.1	33.60
Magnesium	NE*	NA	NA	NA	NA	4530.00
Manganese	NE*	NA	NA	NA	NA	88.20
Mercury	0.1	**0.15**	**0.16**	**0.25**	0.092	0.1
Nickel	13	NA	NA	NA	NA	5.20
Potassium	NE*	NA	NA	NA	NA	364.00
Selenium	2	0.45 U	0.34 U	0.63 B	0.4 U	0.23
Silver	NE*	1.2 B	1.3 B	1.4 B	1 B	0.8
Sodium	NE*	NA	NA	NA	NA	117.00
Thallium	NE*	NA	NA	NA	NA	0.55
Vanadium	150	NA	NA	NA	NA	21.20
Zinc	20	NA	NA	NA	NA	**26.30**
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.97 B	0.41 B	1.2	2.4	NA
PCBs (ug/kg)						
Aroclor 1242	1000	NA	NA	NA	NA	90 U
Aroclor 1254	1000	NA	NA	NA	NA	180 U
Aroclor 1260	1000	NA	NA	NA	NA	180 U
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	18 U
4,4'-DDE	2100	NA	NA	NA	NA	18 U
4,4'-DDT	2100	NA	NA	NA	NA	18 U
Aldrin	2900	NA	NA	NA	NA	9 U
alpha-BHC	110	NA	NA	NA	NA	9 U
alpha-Chlordane	5400	NA	NA	NA	NA	90 U
beta-BHC	200	NA	NA	NA	NA	9 U
delta-BHC	300	NA	NA	NA	NA	9 U
Dieldrin	44	NA	NA	NA	NA	18 U
Endosulfan I	900	NA	NA	NA	NA	9 U
Endosulfan II	900	NA	NA	NA	NA	18 U
Endosulfan sulfate	1000	NA	NA	NA	NA	18 U
Endrin	100	NA	NA	NA	NA	18 U
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	18 U
gamma-Chlordane	540	NA	NA	NA	NA	90 U
Heptachlor	100	NA	NA	NA	NA	9 U
Heptachlor epoxide	20	NA	NA	NA	NA	9 U
Lindane	NE	NA	NA	NA	NA	9 U
Methoxychlor	NE	NA	NA	NA	NA	90 U
Toxaphene	NE	NA	NA	NA	NA	180 U
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		SS-01B	SS-01C	SS-02A	SS-02C	SS-05C
		0.25	0.03	0.25	0.03	0.03
		RPSS01	SSC-1	NYHS-S2	SSC-2	SSC-5
		10/23/1995	10/22/1998	07/11/1989	10/22/1998	10/22/1998
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.005 U	NA	0.006 U	NA	NA
Ethyl benzene	5.5	0.005 U	NA	0.006 U	NA	NA
Toluene	1.5	0.005 U	NA	0.006 U	NA	NA
Xylene (total)	1.2	0.005 U	NA	0.006 U	NA	NA
Total BTEX		0	NA	0	NA	NA
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	10 U	NA	10 U	NA	NA
2-Hexanone	NE	10 U	NA	10 U	NA	NA
Acetone	200	10 U	NA	10 U	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	5 U	NA	6 U	NA	NA
Chlorobenzene	1700	5 U	NA	6 U	NA	NA
Methylene chloride	100	5 U	NA	2 J	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	5 U	NA	6 U	NA	NA
Tetrachloroethene	1400	5 U	NA	6 U	NA	NA
Trichloroethene	700	5 U	NA	6 U	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	0.088 J	**56 D**	**16 J**	**2.8 D**	**13**
Benzo(a)pyrene	0.061	**0.086 J**	**39 D**	**66**	**1.7 J**	**8.7**
Benzo(b)fluoranthene	1.1	0.11 J	**40 D**	**71**	**2.9 D**	**20**
Benzo(k)fluoranthene	1.1	0.1 J	**12**	**29 J**	**1.1**	**3.8**
Chrysene	0.4	0.16 J	**60 D**	**27 J**	**3.1 D**	**14**
Dibenzo(a,h)anthracene	0.014	0.34 U	**4.8**	**13 J**	**0.29 J**	**1.4 J**
Indeno(1,2,3-cd)pyrene	3.2	0.34 U	**13**	**41**	1	**4.1**
Total Carcinogenic PAHs		0.544	224.8	263	12.89	65
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.34 U	3.1 J	5 J	0.72	2.2 J
Acenaphthene	50	0.34 U	1.0 J	37 U	0.17 J	3.5 U
Acenaphthylene	41	0.34 U	15	26 J	0.85	2.3 J
Anthracene	50	0.34 U	16	12 J	0.42	1.3 J
Benzo(g,h,i)perylene	50	0.13 J	13	38	0.99	3.8
Fluoranthene	50	0.16 J	**62 D**	13 J	2.9 D	15 J
Fluorene	50	0.34 U	3.4 J	37 U	0.21 J	3.5 U
Naphthalene	13	0.34 U	2.8 J	5.7 J	0.86	1.5 J
Phenanthrene	50	0.091 J	28	6.9 J	2.4	5.2
Pyrene	50	0.24 J	**190 D**	47	11 D	40 D
Total Non-Carcinogenic PAHs		0.621	334.3	153.6	20.52	71.3
Total PAHs		1.165	559.1	416.6	33.41	136.3
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	340 U	NA	37000 U	NA	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	340 U	NA	37000 U	NA	NA
2,4-Dinitrotoluene	NE	340 U	NA	37000 U	NA	NA
2-Methylphenol	1000	340 U	NA	37000 U	NA	NA
4-Methylphenol	900	340 U	NA	37000 U	NA	NA
Benzene, hydroxy-	NE	340 U	NA	37000 U	NA	NA
Bis(2-ethylhexyl)phthalate	50000	410 B	NA	37000 U	NA	NA
Butylbenzylphthalate	50000	340 U	NA	37000 U	NA	NA
Carbazole	NE	340 U	NA	NA	NA	NA
Dibenzofuran	6200	340 U	NA	37000 U	NA	NA
Di-n-butylphthalate	8100	340 U	NA	37000 U	NA	NA
Di-n-octylphthalate	50000	340 U	NA	37000 U	NA	NA
N-Nitrosodiphenylamine (1)	NE	340 U	NA	37000 U	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		SS-01B	SS-01C	SS-02A	SS-02C	SS-05C
		0.25	0.03	0.25	0.03	0.03
		RPSS01	SSC-1	NYHS-S2	SSC-2	SSC-5
		10/23/1995	10/22/1998	07/11/1989	10/22/1998	10/22/1998
Metals (mg/kg)						
Aluminum	NE*	2190	NA	463.00	NA	NA
Antimony	NE*	1.4	NA	10	NA	NA
Arsenic	7.5	1.25	4.9	6.70	**8.4**	**7.9**
Barium	300	20.5	31.3 B	18.20	**581**	66.5
Beryllium	0.16	**0.44**	NA	0.16	NA	NA
Cadmium	1	0.21	0.6 B	0.8	0.4 B	0.8 B
Calcium	NE*	2760	NA	160.00	NA	NA
Chromium	10	8.0	4.8	5.00	**46.8**	8.1
Cobalt	30	3.8	NA	2.60	NA	NA
Copper	25	17	NA	**36.80**	NA	NA
Iron	2000	**9800**	NA	**24300.00**	NA	NA
Lead	NE*	12.4	143	108.00	501	152
Magnesium	NE*	1930	NA	145.00	NA	NA
Manganese	NE*	58.1	NA	70.00	NA	NA
Mercury	0.1	0.05	0.1 U	0.1	0.1 U	**0.2**
Nickel	13	5.1	NA	6.30	NA	NA
Potassium	NE*	1090	NA	349.00	NA	NA
Selenium	2	0.62	0.7 U	0.61	0.7 B	1.9
Silver	NE*	0.41	0.4 B	0.9	0.6 B	0.7 B
Sodium	NE*	232	NA	161.00	NA	NA
Thallium	NE*	1	NA	0.58	NA	NA
Vanadium	150	8.5	NA	7.60	NA	NA
Zinc	20	**21.2**	NA	**23.50**	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.5	5.3	NA	4.4	14.6
PCBs (ug/kg)						
Aroclor 1242	1000	35 U	340 U	9000 U	NA	340 U
Aroclor 1254	1000	35 U	680 U	19000 U	NA	680 U
Aroclor 1260	1000	35 U	680 U	19000 U	NA	680 U
Pesticides (ug/kg)						
4,4'-DDD	2900	3.5 U	68 U	1900 U	NA	68 U
4,4'-DDE	2100	3.5 U	68 U	1900 U	NA	68 U
4,4'-DDT	2100	1.6 J	68 U	1900 U	NA	68 U
Aldrin	2900	1.8 U	34 U	900 U	NA	34 U
alpha-BHC	110	1.8 U	34 U	900 U	NA	34 U
alpha-Chlordane	5400	1.8 U	NA	9000 U	NA	NA
beta-BHC	200	1.8 U	34 U	900 U	NA	34 U
delta-BHC	300	1.8 U	34 U	900 U	NA	34 U
Dieldrin	44	3.5 U	68 U	1900 U	NA	68 U
Endosulfan I	900	1.8 U	34 U	900 U	NA	34 U
Endosulfan II	900	3.5 U	68 U	1900 U	NA	68 U
Endosulfan sulfate	1000	3.5 U	68 U	1900 U	NA	68 U
Endrin	100	3.5 U	68 U	1900 U	NA	68 U
Endrin aldehyde	NE	NA	68 U	NA	NA	68 U
Endrin ketone	NE	3.5 U	NA	1900 U	NA	NA
gamma-Chlordane	540	1.8 U	NA	9000 U	NA	NA
Heptachlor	100	1.8 U	34 U	900 U	NA	34 U
Heptachlor epoxide	20	1.8 U	34 U	900 U	NA	34 U
Lindane	NE	1.8 U	34 U	900 U	NA	34 U
Methoxychlor	NE	18 U	34 U	9000 U	NA	34 U
Toxaphene	NE	180 U	700 U	19000 U	NA	680 U
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		SS-06B	SS-07A	SS-07B	SS-08B
		0.25	0.25	0.25	0.25
		RPSS06	NYHS-S7	RPSS07	RPSS08
		10/23/1995	07/11/1989	10/23/1995	10/23/1995
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.006	0.009 U	0.005 U	0.016
Ethyl benzene	5.5	0.005 U	0.009 U	0.005 U	0.005 U
Toluene	1.5	0.005	0.009 U	0.005 U	0.025
Xylene (total)	1.2	0.005 U	0.009 U	0.005 U	0.005 U
Total BTEX		0.011	0	0	0.041
Other Volatile Organic Compounds (ug/kg)					
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA
2-Butanone	300	10 U	20 U	10 U	10 U
2-Hexanone	NE	10 U	20 U	10 U	10 U
Acetone	200	10 U	20 U	10 U	10 U
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA
Carbon disulfide	2700	5 U	9 U	5 U	5 U
Chlorobenzene	1700	5 U	9 U	5 U	5 U
Methylene chloride	100	5 U	3 J	4 J	5 U
n-Butylbenzene	NE	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA
Styrene	NE	5 U	9 U	5 U	5 U
Tetrachloroethene	1400	5 U	9 U	5 U	5 U
Trichloroethene	700	5 U	9 U	5 U	5 U
Trichlorofluoromethane	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**0.45**	**7.1**	**3.7**	**6.9**
Benzo(a)pyrene	0.061	**0.34 J**	**12**	**4.4**	**6.4**
Benzo(b)fluoranthene	1.1	0.43	**15**	**5.3**	**3.8**
Benzo(k)fluoranthene	1.1	0.5	**6.6**	**4.6**	**6.8**
Chrysene	0.4	**0.65**	**8.4**	**5.3**	**8.6**
Dibenzo(a,h)anthracene	0.014	0.34 U	**1.1 J**	3.5 U	1.8 U
Indeno(1,2,3-cd)pyrene	3.2	0.5	**4.5**	**4.4**	**5.5**
Total Carcinogenic PAHs		2.87	54.7	27.7	38
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	0.34 U	0.92 J	3.5 U	1.8 U
Acenaphthene	50	0.34 U	3.5 U	3.5 U	1.8 U
Acenaphthylene	41	0.17 J	3.3 J	1.8 J	2.3
Anthracene	50	0.15 J	1.7 J	0.9 J	2
Benzo(g,h,i)perylene	50	0.8	5.3	5.9	7.9
Fluoranthene	50	0.81	8.9	3.6	10
Fluorene	50	0.34 U	3.5 U	3.5 U	0.85 J
Naphthalene	13	0.34 U	1.9 J	3.5 U	0.43 J
Phenanthrene	50	0.36	5.2	1.8 J	8.9
Pyrene	50	1.3	20	6.7	18
Total Non-Carcinogenic PAHs		3.59	47.22	20.7	50.38
Total PAHs		6.46	101.92	48.4	88.38
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	340 U	3500 U	3500 U	1800 U
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	340 U	3500 U	3500 U	1800 U
2,4-Dinitrotoluene	NE	340 U	3500 U	3500 U	1800 U
2-Methylphenol	1000	340 U	3500 U	3500 U	1800 U
4-Methylphenol	900	340 U	3500 U	3500 U	1800 U
Benzene, hydroxy-	NE	340 U	3500 U	3500 U	1800 U
Bis(2-ethylhexyl)phthalate	50000	110 J	3500 U	3500 U	1800 U
Butylbenzylphthalate	50000	340 U	3500 U	3500 U	1800 U
Carbazole	NE	340 U	NA	3500 U	1800 U
Dibenzofuran	6200	340 U	3500 U	3500 U	1800 U
Di-n-butylphthalate	8100	340 U	3500 U	3500 U	1800 U
Di-n-octylphthalate	50000	340 U	3500 U	3500 U	1800 U
N-Nitrosodiphenylamine (1)	NE	340 U	3500 U	3500 U	1800 U
p-Cymene	NE	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		SS-06B	SS-07A	SS-07B	SS-08B
		0.25	0.25	0.25	0.25
		RPSS06	NYHS-S7	RPSS07	RPSS08
		10/23/1995	07/11/1989	10/23/1995	10/23/1995
Metals (mg/kg)					
Aluminum	NE*	2800	2800.00	2220	1190
Antimony	NE*	1.5	10	1.5	1.8
Arsenic	7.5	4.0	3.10	3.6	2.6
Barium	300	30.6	42.00	39.5	23
Beryllium	0.16	**0.21**	0.15	**0.22**	**0.22**
Cadmium	1	0.21	**1.10**	0.22	0.22
Calcium	NE*	48000	4150.00	2680	13700
Chromium	10	4.9	8.60	5.9	4.8
Cobalt	30	2.3	2	2	1.6
Copper	25	12.2	**25.30**	**30.4**	23.4
Iron	2000	**10000**	**8980.00**	**11500**	**7030**
Lead	NE*	29.7	111.00	174	55.3
Magnesium	NE*	26400	2110.00	920	7260
Manganese	NE*	92	67.00	65.7	55.2
Mercury	0.1	0.05	**0.52**	**0.16**	0.05
Nickel	13	8.2	6.40	6.5	7.1
Potassium	NE*	353	251.00	310	273
Selenium	2	0.62	0.21	0.65	0.67
Silver	NE*	0.41	0.8	0.43	0.44
Sodium	NE*	149	82.30	173	129
Thallium	NE*	1	0.55	1.12	1.12
Vanadium	150	20.1	11.90	9.8	12.1
Zinc	20	**32.7**	**71.20**	**53.1**	**42.3**
Total Cyanide (mg/kg)					
Cyanide, total	NE	NA	NA	10.8	23.0
PCBs (ug/kg)					
Aroclor 1242	1000	34 U	8000 U	36 U	37 U
Aroclor 1254	1000	34 U	18000 U	36 U	37 U
Aroclor 1260	1000	34 U	18000 U	36 U	37 U
Pesticides (ug/kg)					
4,4'-DDD	2900	3.4 U	1800 U	3.6 U	3.7 U
4,4'-DDE	2100	3.4 U	1800 U	3.6 U	3.7 U
4,4'-DDT	2100	3.4 U	1800 U	8.8	15
Aldrin	2900	1.7 U	800 U	1.8 U	1.0 J
alpha-BHC	110	1.7 U	800 U	4.2	1.8 U
alpha-Chlordane	5400	1.7 U	8000 U	6.9	1.8 U
beta-BHC	200	1.7 U	800 U	1.8 U	1.8 U
delta-BHC	300	1.7 U	800 U	1.8 U	1.8 U
Dieldrin	44	3.4 U	1800 U	3.0 J	6.3
Endosulfan I	900	1.7 U	800 U	1.8 U	1.8 U
Endosulfan II	900	3.4 U	1800 U	3.6 U	3.7 U
Endosulfan sulfate	1000	3.4 U	1800 U	4.2	2.8 J
Endrin	100	3.4 U	1800 U	3.6 U	3.7 U
Endrin aldehyde	NE	NA	NA	NA	NA
Endrin ketone	NE	3.4 U	1800 U	3.6 U	3.7 U
gamma-Chlordane	540	1.7 U	8000 U	1.8 U	1.8 U
Heptachlor	100	1.7 U	800 U	1.8 U	1.8 U
Heptachlor epoxide	20	1.7 U	800 U	1.8 U	1.8 U
Lindane	NE	1.7 U	800 U	1.8 U	1.8 U
Methoxychlor	NE	17 U	8000 U	18 U	18 U
Toxaphene	NE	170 U	18000 U	180 U	180 U
TCLP					
TCLP Benzene (ug/l)					
Benzene (TCLP)	NE	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)					
o-Cresol (TCLP)	NE	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA
TCLP Metals (ug/l)					
Arsenic (TCLP)	NE	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA

Table 4-32 (continued)
Surface-Soil Analytical Results
Former Gas Works Area
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-33
Surface-Soil Analytical Results
Former Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		SS-02B	SS-04A	SS-04C	SS-05A
		0.25	0.25	0.03	0.25
		RPSS02	NYHS-S4	SSC-4	NYHS-S5 (DUP)
		10/23/1995	07/11/1989	10/22/1998	07/11/1989
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.016	0.009 U	NA	0.008 U
Ethyl benzene	5.5	0.006 U	0.009 U	NA	0.008 U
Toluene	1.5	0.028	0.009 U	NA	0.008 U
Xylene (total)	1.2	0.006	0.009 U	NA	0.008 U
Total BTEX		0.05	0	NA	0
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	10 U	20 U	NA	20 U
2-Hexanone	NE	10 U	20 U	NA	20 U
Acetone	200	10 U	20 U	NA	20 U
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	6 U	9 U	NA	8 U
Chlorobenzene	1700	6 U	9 U	NA	8 U
Methylene chloride	100	4 J	6 J	NA	7 J
Styrene	NE	6 U	9 U	NA	8 U
Tetrachloroethene	1400	6 U	9 U	NA	8 U
Trichloroethene	700	6 U	9 U	NA	8 U
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**23**	**13 E**	**0.52 J**	**16**
Benzo(a)pyrene	0.061	**12**	**21 E**	**0.34 J**	**24**
Benzo(b)fluoranthene	1.1	**15**	**28 E**	0.82	**26**
Benzo(k)fluoranthene	1.1	**22**	**8.1 E**	0.27 J	**20**
Chrysene	0.4	**34**	**21 E**	**0.67 J**	**26**
Dibenzo(a,h)anthracene	0.014	9.2 U	**2.5 J**	0.70 U	**2.7 J**
Indeno(1,2,3-cd)pyrene	3.2	**11**	**7.7 E**	0.22 J	**8.8**
Total Carcinogenic PAHs		117	101.3	2.84	123.5
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	2.5 J	3.4 J	1.5	3.2 J
Acenaphthene	50	9.2 U	3.7 U	0.70 U	3.6 U
Acenaphthylene	41	3.7 J	10 E	0.3 J	11
Anthracene	50	3.3 J	4.7 E	0.098 J	5
Benzo(g,h,i)perylene	50	14	6.7 E	0.23 J	8.9
Fluoranthene	50	36	20 E	0.82	28
Fluorene	50	9.2 U	0.71 J	0.70 U	0.66 J
Naphthalene	13	3.3 J	2.7 J	2.2	3.8
Phenanthrene	50	38	18 E	0.42 J	17
Pyrene	50	**63**	36 E	1.4	40
Total Non-Carcinogenic PAHs		163.8	102.21	6.968	117.56
Total PAHs		280.8	203.51	9.808	241.06
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	9200 U	3700 U	NA	3600 U
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	9200 U	3700 U	NA	3600 U
2,4-Dinitrotoluene	NE	9200 U	420 J	NA	700 J
2-Methylphenol	100	9200 U	3700 U	NA	3600 U
4-Methylphenol	900	9200 U	3700 U	NA	3600 U
Benzene, hydroxy-	NE	NA	**3700 U**	NA	**3600 U**
Bis(2-ethylhexyl)phthalate	50000	9200 U	3700 U	NA	3600 U
Butylbenzylphthalate	50000	9200 U	3700 U	NA	3600 U
Carbazole	NE	9200 U	3700 U	NA	NA
Dibenzofuran	6200	9200 U	3700 U	NA	3600 U
Di-n-butylphthalate	8100	9200 U	3700 U	NA	3600 U
Di-n-octylphthalate	50000	9200 U	3700 U	NA	3600 U
N-Nitrosodiphenylamine (1)	NE	9200 U	3700 U	NA	3600 U

Table 4-33 (continued)
Surface-Soil Analytical Results
Former Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		SS-02B	SS-04A	SS-04C	SS-05A
		0.25	0.25	0.03	0.25
		RPSS02	NYHS-S4	SSC-4	NYHS-S5 (DUP)
		10/23/1995	07/11/1989	10/22/1998	07/11/1989
Metals (mg/kg)					
Aluminum	NE*	361	1110.00	NA	1070.00
Antimony	NE*	1.6	12.50	NA	12.60
Arsenic	7.5	4.3	**12.50**	**27.2**	**13.20**
Barium	300	82.1	75.10	17.8 B	74.50
Beryllium	0.16	**0.28**	0.16	NA	0.15
Cadmium	1	0.22	**1.80**	0.3 B	0.8
Calcium	NE*	79.1	102.00	NA	161.00
Chromium	10	5.7	**11.50**	2.8	9.80
Cobalt	30	0.85	2.40	NA	2
Copper	25	**35.2**	**142.00**	NA	**120.00**
Iron	2000	**9890**	**27100.00**	NA	**23000.00**
Lead	NE*	235	785.00	27.1	785.00
Magnesium	NE*	66	153.00	NA	176.00
Manganese	NE*	14.3	78.50	NA	68.40
Mercury	0.1	**0.35**	**0.31**	0.1 U	**0.29**
Nickel	13	4.4	9.20	NA	7.70
Potassium	NE*	427	445.00	NA	423.00
Selenium	2	1.1	0.88	1.8	1.20
Silver	NE*	0.44	0.9	0.3 U	0.9
Sodium	NE*	249	141.00	NA	152.00
Thallium	NE*	1.1	0.58	NA	0.57
Vanadium	150	12.5	35.80	NA	34.00
Zinc	20	14.5	**90.20**	NA	**95.70**
Total Cyanide (mg/kg)					
Cyanide, total	NE	111	NA	6.1	NA
PCBs (ug/kg)					
Aroclor 1242	1000	38 U	4000 U	NA	3000 U
Aroclor 1254	1000	38 U	9400 U	NA	5600 U
Aroclor 1260	1000	38 U	9400 U	NA	5600 U
Pesticides (ug/kg)					
4,4'-DDD	2900	27	940 U	NA	560 U
4,4'-DDE	2100	3.8 U	940 U	NA	560 U
4,4'-DDT	2100	3.8 U	940 U	NA	560 U
Aldrin	41	1.9 U	400 U	NA	300 U
alpha-BHC	110	1.9 U	400 U	NA	300 U
alpha-Chlordane	NE	30	4000 U	NA	3000 U
beta-BHC	200	1.9 U	400 U	NA	300 U
delta-BHC	300	1.9 U	400 U	NA	300 U
Dieldrin	44	2.1 J	940 U	NA	560 U
Endosulfan I	900	1.9 U	400 U	NA	300 U
Endosulfan II	900	3.8 U	940 U	NA	560 U
Endosulfan sulfate	1000	3.8 U	940 U	NA	560 U
Endrin	100	3.8 U	940 U	NA	560 U
Endrin aldehyde	NE	NA	NA	NA	NA
Endrin ketone	NE	3.8 U	940 U	NA	560 U
gamma-Chlordane	540	12	4000 U	NA	3000 U
Heptachlor	100	4	400 U	NA	300 U
Heptachlor epoxide	20	1.9 U	400 U	NA	300 U
Lindane	NE	1.9 U	400 U	NA	300 U
Methoxychlor	NE	19 U	4000 U	NA	3000 U
Toxaphene	NE	190 U	9400 U	NA	5600 U
TCLP					
TCLP Benzene (ug/l)					
Benzene (TCLP)	NE	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)					
o-Cresol (TCLP)	NE	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA
TCLP Metals (ug/l)					
Arsenic (TCLP)	NE	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA

Table 4-33 (continued)
Surface-Soil Analytical Results
Former Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		SS-07C	SS-08C	SS-09C	SS-10C
		0.03	0.03	0.03	0.03
		SSC-7	SSC-8	SSC-9	SSC-10
		10/22/1998	10/22/1998	10/22/1998	10/22/1998
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	NA	NA	NA	NA
Ethyl benzene	5.5	NA	NA	NA	NA
Toluene	1.5	NA	NA	NA	NA
Xylene (total)	1.2	NA	NA	NA	NA
Total BTEX		NA	NA	NA	NA
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**70 JD**	**79 D**	**46 D**	**29**
Benzo(a)pyrene	0.061	**42**	**25 DJ**	**18**	**23**
Benzo(b)fluoranthene	1.1	**59 JD**	**68 D**	**43 D**	**22 DJ**
Benzo(k)fluoranthene	1.1	**16**	**23 DJ**	**15**	**9.7**
Chrysene	0.4	**75 D**	**100 D**	**58 D**	**33 DJ**
Dibenzo(a,h)anthracene	0.014	**6.8 J**	**7.1**	**4.5**	**2.5 J**
Indeno(1,2,3-cd)pyrene	3.2	**20**	**18 DJ**	**11**	**7.9**
Total Carcinogenic PAHs		288.8	320.1	195.5	127.1
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	8.2 J	**42 D**	36 DJ	28
Acenaphthene	50	0.95 J	2.1	2.9 J	3 J
Acenaphthylene	41	18	13	11	5.5
Anthracene	50	13	11	9.1	7.2
Benzo(g,h,i)perylene	50	20	15 DJ	13	7.2
Fluoranthene	50	**98 D**	**130 D**	**85 D**	**68 D**
Fluorene	50	6.1 J	8.4	8.6	6.4
Naphthalene	13	11	**49 D**	**28**	**20**
Phenanthrene	50	**98 D**	**140 D**	**210 D**	**210 D**
Pyrene	50	**340 D**	**230 D**	**110 D**	**80 D**
Total Non-Carcinogenic PAHs		613.25	640.5	513.6	435.3
Total PAHs		902.05	960.6	709.1	562.4
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA

Table 4-33 (continued)
Surface-Soil Analytical Results
Former Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		SS-07C	SS-08C	SS-09C	SS-10C
		0.03	0.03	0.03	0.03
		SSC-7	SSC-8	SSC-9	SSC-10
		10/22/1998	10/22/1998	10/22/1998	10/22/1998
Metals (mg/kg)					
Aluminum	NE*	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA
Arsenic	7.5	**18.8**	**19.7**	**29**	**19.7**
Barium	300	170	93 B	70 B	85 B
Beryllium	0.16	NA	NA	NA	NA
Cadmium	1	0.5 B	0.9 B	0.7 B	0.6 B
Calcium	NE*	NA	NA	NA	NA
Chromium	10	7.7	**10.1**	**15.4**	**12**
Cobalt	30	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA
Lead	NE*	352	182	412	341
Magnesium	NE*	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA
Mercury	0.1	**0.4**	0.1 U	0.1 U	0.1 U
Nickel	13	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA
Selenium	2	1.8	1.5	**2.4**	1.8
Silver	NE*	0.8 B	0.6 U	0.6 U	0.6 U
Sodium	NE*	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	117	230	794	212
PCBs (ug/kg)					
Aroclor 1242	1000	340 U	NA	NA	NA
Aroclor 1254	1000	680 U	NA	NA	NA
Aroclor 1260	1000	680 U	NA	NA	NA
Pesticides (ug/kg)					
4,4'-DDD	2900	68 U	NA	NA	NA
4,4'-DDE	2100	68 U	NA	NA	NA
4,4'-DDT	2100	68 U	NA	NA	NA
Aldrin	41	34 U	NA	NA	NA
alpha-BHC	110	34 U	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA
beta-BHC	200	34 U	NA	NA	NA
delta-BHC	300	34 U	NA	NA	NA
Dieldrin	44	68 U	NA	NA	NA
Endosulfan I	900	34 U	NA	NA	NA
Endosulfan II	900	68 U	NA	NA	NA
Endosulfan sulfate	1000	68 U	NA	NA	NA
Endrin	100	68 U	NA	NA	NA
Endrin aldehyde	NE	68 U	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA
Heptachlor	100	34 U	NA	NA	NA
Heptachlor epoxide	20	34 U	NA	NA	NA
Lindane	NE	34 U	NA	NA	NA
Methoxychlor	NE	340 U	NA	NA	NA
Toxaphene	NE	680 U	NA	NA	NA
TCLP					
TCLP Benzene (ug/l)					
Benzene (TCLP)	NE	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)					
o-Cresol (TCLP)	NE	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA
TCLP Metals (ug/l)					
Arsenic (TCLP)	NE	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA

Table 4-33 (continued)
Surface-Soil Analytical Results
Former Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSS-17	RPSS-18		RPSS-19
		0-0.17	0-0.17	0-0.17 Dup	0-0.17
		RPSS-17 (0-2")	RPSS-18 (0-2")	RPSSXX092502	RPSS-19 (0-2")
		09/25/2002	09/25/2002	9/25/2002	09/25/2002
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	NA	NA	NA	NA
Ethyl benzene	5.5	NA	NA	NA	NA
Toluene	1.5	NA	NA	NA	NA
Xylene (total)	1.2	NA	NA	NA	NA
Total BTEX		NA	NA	NA	NA
Other Volatile Organic Compounds (ug/kg)					
2-Butanone	300	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	NA
Chlorobenzene	1700	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA
Tetrachloroethene	1400	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	NA	NA	NA	NA
Benzo(a)pyrene	0.061	NA	NA	NA	NA
Benzo(b)fluoranthene	1.1	NA	NA	NA	NA
Benzo(k)fluoranthene	1.1	NA	NA	NA	NA
Chrysene	0.4	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.014	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	3.2	NA	NA	NA	NA
Total Carcinogenic PAHs		NA	NA	NA	NA
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	NA	NA	NA	NA
Acenaphthene	50	NA	NA	NA	NA
Acenaphthylene	41	NA	NA	NA	NA
Anthracene	50	NA	NA	NA	NA
Benzo(g,h,i)perylene	50	NA	NA	NA	NA
Fluoranthene	50	NA	NA	NA	NA
Fluorene	50	NA	NA	NA	NA
Naphthalene	13	NA	NA	NA	NA
Phenanthrene	50	NA	NA	NA	NA
Pyrene	50	NA	NA	NA	NA
Total Non-Carcinogenic PAHs		NA	NA	NA	NA
Total PAHs		NA	NA	NA	NA
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	NA
1-Methyl naphthalene (mg/kg)	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA
2-Methylphenol	100	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	NA	NA	NA	NA
Di-n-butylphthalate	8100	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA

Table 4-33 (continued)
Surface-Soil Analytical Results
Former Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSS-17	RPSS-18		RPSS-19
		0-0.17	0-0.17	0-0.17 Dup	0-0.17
		RPSS-17 (0-2")	RPSS-18 (0-2")	RPSSXX092502	RPSS-19 (0-2")
		09/25/2002	09/25/2002	9/25/2002	09/25/2002
Metals (mg/kg)					
Aluminum	NE*	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA
Arsenic	7.5	NA	NA	NA	NA
Barium	300	NA	NA	NA	NA
Beryllium	0.16	NA	NA	NA	NA
Cadmium	1	NA	NA	NA	NA
Calcium	NE*	NA	NA	NA	NA
Chromium	10	NA	NA	NA	NA
Cobalt	30	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA
Lead	NE*	NA	NA	NA	NA
Magnesium	NE*	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA
Mercury	0.1	NA	NA	NA	NA
Nickel	13	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA
Selenium	2	NA	NA	NA	NA
Silver	NE*	NA	NA	NA	NA
Sodium	NE*	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA
Total Cyanide (mg/kg)					
Cyanide, total	NE	NA	NA	NA	NA
PCBs (ug/kg)					
Aroclor 1242	1000	35 U	33 U	34 U	33 U
Aroclor 1254	1000	35 U	33 U	34 U	33 U
Aroclor 1260	1000	35 U	33 U	34 U	33 U
Pesticides (ug/kg)					
4,4'-DDD	2900	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA
Aldrin	41	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA
alpha-Chlordane	NE	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA
TCLP					
TCLP Benzene (ug/l)					
Benzene (TCLP)	NE	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)					
o-Cresol (TCLP)	NE	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA
TCLP Metals (ug/l)					
Arsenic (TCLP)	NE	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA

Table 4-33 (continued)
Surface-Soil Analytical Results
Former Electric Substation Area
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-34
Surface-Soil Analytical Results
Former 2 Million Cubic Foot Holder and Drip Tank Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSS-10	RPSS-15	RPSS-16	SS-03A
		0-0.5	0-0.5	0-0.5	0.25
		RPSS-10 (0-6")	RPSS-15 (0-6")	RPSS-16 (0-6")	NYHS-S3
		01/04/2000	01/04/2000	01/12/2000	07/11/1989
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	0.06	0.001 U	0.002	0.001 U	0.005 U
Toluene	1.5	0.001 U	0.001 U	0.002	0.005 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.005 U
Xylene (total)	1.2	0.001 U	0.001 U	0.006	0.005 U
Total BTEX		0	0.002	0.008	0
Other Volatile Organic Compounds (ug/kg)					
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	10 U
2-Hexanone	NE	NA	NA	NA	10 U
Acetone	200	NA	NA	NA	10 U
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA
Carbon disulfide	2700	NA	NA	NA	5 U
Chlorobenzene	1700	NA	NA	NA	5 U
Methylene chloride	100	NA	NA	NA	5 U
n-Butylbenzene	NE	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	5 U
Tetrachloroethene	1700	NA	NA	NA	5 U
Trichloroethene	700	NA	NA	NA	5 U
Trichlorofluoromethane	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	0.224	**15**	**2.2 J**	**8.3**	15 U
Benzo(a)pyrene	0.061	**8.4**	**2 J**	**6.4**	**1.8 J**
Benzo(b)fluoranthene	1.1	**19**	**2.4 J**	**9.3**	**1.9 J**
Benzo(k)fluoranthene	1.1	**10**	**1.2 J**	**4.1**	**2.1 J**
Chrysene	0.4	**20**	**1.8 J**	**9.4**	**1.7 J**
Dibenzo(a,h)anthracene	0.014	**3.3 J**	3.6 U	**1.3 J**	15 U
Indeno(1,2,3-cd)pyrene	3.2	**11**	1.5 J	**5**	15 U
Total Carcinogenic PAHs		86.7	11.1	43.8	7.5
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	36.4	3.7 J	3.6 U	0.37 J	15 U
Acenaphthene	50	3.8 U	3.6 U	1.7 U	15 U
Acenaphthylene	41	13	0.62 J	6.6	15 U
Anthracene	50	6.6	0.48 J	2.6	15 U
Benzo(g,h,i)perylene	50	12	1.7 J	5.8	15 U
Fluoranthene	50	17	3.3 J	10	1.7 J
Fluorene	50	1.3 J	3.6 U	0.5 J	15 U
Naphthalene	13	3.9	3.6 U	0.41 J	1.6 J
Phenanthrene	50	10	0.96 J	3.7	15 U
Pyrene	50	31	3.6 J	21	2.7 J
Total Non-Carcinogenic PAHs		98.5	10.66	50.98	6
Total PAHs		185.2	21.76	94.78	13.5
Other Semivolatile Organic Compounds (ug/kg)					
1,2-Dichlorobenzene	7900	NA	NA	NA	15000 U
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	NE	NA	NA	NA	15000 U
2,4-Dinitrotoluene	NE	NA	NA	NA	15000 U
2-Methylphenol	100	NA	NA	NA	15000 U
4-Methylphenol	900	NA	NA	NA	15000 U
Benzene, hydroxy-	NE	11000 U	11000 U	12000 U	15000 U
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	15000 U
Butylbenzylphthalate	50000	NA	NA	NA	15000 U
Carbazole	NE	NA	NA	NA	NA
Dibenzofuran	6200	390 J	3600 U	1700 U	15000 U
Di-n-butylphthalate	8100	NA	NA	NA	15000 U
Di-n-octylphthalate	50000	NA	NA	NA	15000 U
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	15000 U

Table 4-34 (continued)
Surface-Soil Analytical Results
Former 2 Million Cubic Foot Holder and Drip Tank Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date			
		RPSS-10	RPSS-15	RPSS-16	SS-03A
		0.00	0.00	0.00	0.25
		RPSS-10 (0-6")	RPSS-15 (0-6")	RPSS-16 (0-6")	NYHS-S3
		01/04/2000	01/04/2000	01/12/2000	07/11/1989
Metals (mg/kg)					
Aluminum	NE*	NA	NA	NA	2030.00
Antimony	NE*	NA	NA	NA	10
Arsenic	7.5	**12.2**	2	**10**	2.00
Barium	300	68.7	24.7	59.5 *	20.60
Beryllium	0.16	NA	NA	NA	0.15
Cadmium	1	**2.8**	0.79	**2.8**	0.82
Calcium	NE*	NA	NA	NA	2730.00
Chromium	10	**25.7**	7	**27.8**	**17.00**
Cobalt	30	NA	NA	NA	2.20
Copper	25	NA	NA	NA	20.30
Iron	2000	NA	NA	NA	**7100.00**
Lead	NE*	270	59.3	706 *	108.00
Magnesium	NE*	NA	NA	NA	1460.00
Manganese	NE*	NA	NA	NA	66.20
Mercury	0.1	**0.39**	**0.11**	**0.56**	0.1
Nickel	13	NA	NA	NA	4.40
Potassium	NE*	NA	NA	NA	235.00
Selenium	2	1.5 B	0.42 U	**7.5**	0.28
Silver	NE*	6.6	1.6 B	1.7 B	0.9
Sodium	NE*	NA	NA	NA	91.10
Thallium	NE*	NA	NA	NA	0.58
Vanadium	150	NA	NA	NA	8.80
Zinc	20	NA	NA	NA	**39.20**
Total Cyanide (mg/kg)					
Cyanide, total	NE	9.4	0.26 B	7	NA
PCBs (ug/kg)					
Aroclor 1242	1000	NA	NA	NA	900 U
Aroclor 1254	1000	NA	NA	NA	1900 U
Aroclor 1260	1000	NA	NA	NA	1900 U
Pesticides (ug/kg)					
4,4'-DDD	2900	NA	NA	NA	190 U
4,4'-DDE	2100	NA	NA	NA	190 U
4,4'-DDT	2100	NA	NA	NA	190 U
Aldrin	41	NA	NA	NA	90 U
alpha-BHC	110	NA	NA	NA	90 U
alpha-Chlordane	NE	NA	NA	NA	900 U
beta-BHC	200	NA	NA	NA	90 U
delta-BHC	300	NA	NA	NA	90 U
Dieldrin	44	NA	NA	NA	190 U
Endosulfan I	900	NA	NA	NA	90 U
Endosulfan II	900	NA	NA	NA	190 U
Endosulfan sulfate	1000	NA	NA	NA	190 U
Endrin	100	NA	NA	NA	190 U
Endrin aldehyde	NE	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	190 U
gamma-Chlordane	540	NA	NA	NA	900 U
Heptachlor	100	NA	NA	NA	90 U
Heptachlor epoxide	20	NA	NA	NA	90 U
Lindane	NE	NA	NA	NA	90 U
Methoxychlor	NE	NA	NA	NA	900 U
Toxaphene	NE	NA	NA	NA	1900 U

Table 4-34 (continued)
Surface-Soil Analytical Results
Former 2 Million Cubic Foot Holder and Drip Tank Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		SS-03B	SS-04B	SS-05B	SS-06A	SS-06C
		0.25	0.25	0.25	0.25	0.03
		RPSS03	RPSS04	RPSS05	NYHS-S6	SSC-6
		10/23/1995	10/23/1995	10/23/1995	07/11/1989	10/22/1998
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.004 J	0.006	0.009	0.008 U	NA
Toluene	1.5	0.005 U	0.005 U	0.005 U	0.008 U	NA
Ethyl benzene	5.5	0.008	0.006	0.012	0.008 U	NA
Xylene (total)	1.2	0.005 U	0.005 U	0.005 U	0.008 U	NA
Total BTEX		0.012	0.012	0.021	0	NA
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	10 U	10 U	10 U	20 U	NA
2-Hexanone	NE	10 U	10 U	10 U	20 U	NA
Acetone	200	10 U	10 U	10 U	20 U	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2700	5 U	5 U	5 U	8 U	NA
Chlorobenzene	1700	5 U	5 U	5 U	8 U	NA
Methylene chloride	100	4 J	5 U	5 U	8 U	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	5 U	5 U	5 U	8 U	NA
Tetrachloroethene	1700	5 U	5 U	5 U	8 U	NA
Trichloroethene	700	5 U	5 U	5 U	8 U	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**10**	**1.4**	**35**	**4.6**	**7.4**
Benzo(a)pyrene	0.061	**10**	**0.94**	**15**	**5.2**	**3.3**
Benzo(b)fluoranthene	1.1	**7.4**	1.1	**27**	**4.6**	**9.3**
Benzo(k)fluoranthene	1.1	**11**	**1.6**	**35**	**3.9**	**2.8**
Chrysene	0.4	**13**	**2.2**	**51**	**6.6**	**9.1**
Dibenzo(a,h)anthracene	0.014	1.8 U	0.35 U	7 U	**0.99 J**	**0.62 J**
Indeno(1,2,3-cd)pyrene	3.2	**8.7**	1.2	**26**	**3.2 J**	1.8 J
Total Carcinogenic PAHs		60.1	8.44	189	29.09	34.32
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	0.56 J	0.11 J	7 U	0.61 J	0.81 J
Acenaphthene	50	1.8 U	0.35 U	7 U	3.4 U	1.8 U
Acenaphthylene	41	2.9	0.39	12	2.3 J	1.4 J
Anthracene	50	1.6 J	0.29 J	7.7	1.1 J	0.81 J
Benzo(g,h,i)perylene	50	12	1.7	32	3.9	1.6 J
Fluoranthene	50	10	2.3	48	7	9.8
Fluorene	50	1.8 U	0.074 J	1.6 J	0.6 J	0.19 J
Naphthalene	13	1.2 J	0.13 J	7 U	1.2 J	0.63 J
Phenanthrene	50	3.8	1.5	20	7.8	3.7
Pyrene	50	21	3.7	**88**	13	17 D
Total Non-Carcinogenic PAHs		53.06	10.194	209.3	37.51	35.94
Total PAHs		113.16	18.634	398.3	66.6	70.26
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	1800 U	350 U	7000 U	3400 U	NA
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NE	1800 U	350 U	7000 U	3400 U	NA
2,4-Dinitrotoluene	NE	1800 U	350 U	7000 U	3400 U	NA
2-Methylphenol	100	1800 U	350 U	7000 U	3400 U	NA
4-Methylphenol	900	1800 U	350 U	7000 U	3400 U	NA
Benzene, hydroxy-	NE	1800 U	350 U	7000 U	3400 U	NA
Bis(2-ethylhexyl)phthalate	50000	1800 U	310 J	7000 U	3400 U	NA
Butylbenzylphthalate	50000	1800 U	89 J	7000 U	3400 U	NA
Carbazole	NE	1800 U	350 U	7000 U	NA	NA
Dibenzofuran	6200	1800 U	350 U	7000 U	3400 U	NA
Di-n-butylphthalate	8100	1800 U	55 J	7000 U	3400 U	NA
Di-n-octylphthalate	50000	1800 U	120 J	7000 U	3400 U	NA
N-Nitrosodiphenylamine (1)	NE	1800 U	350 U	7000 U	3400 U	NA

Table 4-34 (continued)
Surface-Soil Analytical Results
Former 2 Million Cubic Foot Holder and Drip Tank Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site ID/Depth (ft)/Sample ID/Date				
		SS-03B	SS-04B	SS-05B	SS-06A	SS-06C
		0.25	0.25	0.25	0.25	0.03
		RPSS03	RPSS04	RPSS05	NYHS-S6	SSC-6
		10/23/1995	10/23/1995	10/23/1995	07/11/1989	10/22/1998
Metals (mg/kg)						
Aluminum	NE*	1490	1700	735	2120.00	NA
Antimony	NE*	1.5	1.5	3.2	10	NA
Arsenic	7.5	4.2	2.9	**14.8**	2.90	**9.2**
Barium	300	33.4	29.8	67.6	29.60	46.6
Beryllium	0.16	**0.24**	**0.22**	**0.22**	0.14	NA
Cadmium	1	0.22	0.21	0.22	0.64	0.7 B
Calcium	NE*	2280	587	312	1220.00	NA
Chromium	10	**39.3**	5.8	19.6	7.80	6.8
Cobalt	30	1.7	3.1	1.7	3.30	NA
Copper	25	**31.7**	21.5	**59.1**	**34.20**	NA
Iron	2000	**8670**	**6820**	**19900**	**6910.00**	NA
Lead	NE*	277	67.7	761	87.70	264
Magnesium	NE*	1190	543	275	588.00	NA
Manganese	NE*	48.1	81.3	55.2	72.40	NA
Mercury	0.1	**0.11**	0.05	**0.27**	0.1	**0.2**
Nickel	13	5.1	8.6	8.3	9.50	NA
Potassium	NE*	199	266	154	286.00	NA
Selenium	2	0.66	0.62	1.2	0.24	0.7 B
Silver	NE*	0.43	0.42	0.43	0.8	0.7 B
Sodium	NE*	163	123	189	55.80	NA
Thallium	NE*	1.1	1	1.1	0.54	NA
Vanadium	150	9.6	9.7	13.2	9.60	NA
Zinc	20	**76.7**	**75.2**	**54.5**	**94.80**	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	40.8	NA	324	NA	11.4
PCBs (ug/kg)						
Aroclor 1242	1000	37 U	36 U	180 U	800 U	NA
Aroclor 1254	1000	37 U	36 U	180 U	1800 U	NA
Aroclor 1260	1000	37 U	36 U	180 U	1800 U	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	3.7 U	3.6 U	18 U	180 U	NA
4,4'-DDE	2100	3.7 U	3.6 U	18 U	180 U	NA
4,4'-DDT	2100	3.7 U	8.4	73	180 U	NA
Aldrin	41	0.84 J	1.8 U	9.0 U	80 U	NA
alpha-BHC	110	1.8 U	1.8 U	9.0 U	80 U	NA
alpha-Chlordane	NE	2.6	1.8 U	9.0 U	800 U	NA
beta-BHC	200	1.8 U	1.8 U	9.0 U	80 U	NA
delta-BHC	300	1.8 U	1.8 U	9.0 U	80 U	NA
Dieldrin	44	1.9 J	0.74 J	**96**	180 U	NA
Endosulfan I	900	1.8 U	1.8 U	9.0 U	80 U	NA
Endosulfan II	900	3.7 U	3.6 U	18	180 U	NA
Endosulfan sulfate	1000	3.7 U	3.6 U	26	180 U	NA
Endrin	100	3.7 U	3.6 U	18 U	180 U	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	3.7 U	3.6 U	18 U	180 U	NA
gamma-Chlordane	540	1.8 U	1.8 U	9.0 U	800 U	NA
Heptachlor	100	1.8 U	1.8 U	9.0 U	80 U	NA
Heptachlor epoxide	20	1.8 U	1.8 U	9.0 U	80 U	NA
Lindane	NE	1.8 U	1.8 U	9.0 U	80 U	NA
Methoxychlor	NE	18 U	18 U	90 U	800 U	NA
Toxaphene	NE	180 U	180 U	900 U	1800 U	NA

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-35
Surface-Soil Analytical Results
Current Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date	
		RPSS-04	SS-09B
		0-0.5	0.25
		RPSS-04 (0-6")	RPSS09
		01/04/2000	10/23/1995
Volatile Organic Compounds (VOCs)			
BTEX (mg/kg)			
Benzene	0.06	0.001 U	0.006
Ethyl benzene	5.5	0.001 U	0.005 U
Toluene	1.5	0.001 U	0.01
Xylene (total)	1.2	0.001 U	0.005 U
Total BTEX		0	0.016
Other Volatile Organic Compounds (ug/kg)			
1,2,3-Trichlorobenzene	NE	NA	NA
2-Butanone	300	NA	10 U
2-Hexanone	NE	NA	10 U
Acetone	200	NA	10 U
Benzene, 1,2,4-trimethyl	NE	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA
Carbon disulfide	2,700	NA	5 U
Chlorobenzene	1,700	NA	5 U
Methylene chloride	100	NA	5 U
n-Butylbenzene	NE	NA	NA
n-Propylbenzene	NE	NA	NA
sec-Butylbenzene	NE	NA	NA
Styrene	NE	NA	5 U
Tetrachloroethene	1,400	NA	5 U
Trichloroethene	700	NA	5 U
Trichlorofluoromethane	NE	NA	NA
Semivolatile Organic Compounds (SVOCs)			
Carcinogenic PAHs (mg/kg)			
Benzo(a)anthracene	0.224	**7.6**	0.098 J
Benzo(a)pyrene	0.061	**5.7**	**0.086 J**
Benzo(b)fluoranthene	1.1	**6.7**	0.12 J
Benzo(k)fluoranthene	1.1	**2.4 J**	0.15 J
Chrysene	0.4	**8.3**	0.17 J
Dibenzo(a,h)anthracene	0.014	**1.4 J**	0.35 U
Indeno(1,2,3-cd)pyrene	3.2	**4.3**	0.15 J
Total Carcinogenic PAHs		36.4	0.774
Non-Carcinogenic PAHs (mg/kg)			
2-Methylnaphthalene	36.4	1.9 J	0.35 U
Acenaphthene	50	3.5 U	0.35 U
Acenaphthylene	41	4.7	0.076 J
Anthracene	50	2.6 J	0.35 U
Benzo(g,h,i)perylene	50	5.7	0.28 J
Fluoranthene	50	8	0.11 J
Fluorene	50	0.74 J	0.35 U
Naphthalene	13	2.6 J	0.35 U
Phenanthrene	50	5.1	0.096 J
Pyrene	50	16	0.25 J
Total Non-Carcinogenic PAHs		47.34	0.812
Total PAHs		83.74	1.586

Table 4-35 (continued)
Surface-Soil Analytical Results
Current Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date	
		RPSS-04	SS-09B
		0-0.5	0.25
		RPSS-04 (0-6")	RPSS09
		01/04/2000	10/23/1995
Other Semivolatile Organic Compounds (ug/kg)			
1,2-Dichlorobenzene	7900	NA	350 U
1-Methyl naphthalene	NE	NA	NA
2,4-Dimethylphenol	NE	NA	350 U
2,4-Dinitrotoluene	NE	NA	350 U
2-Methylphenol	1000	NA	350 U
4-Methylphenol	900	NA	350 U
Benzene, hydroxy-	NE	11000 U	350 U
Bis(2-ethylhexyl)phthalate	50000	NA	140 J
Butylbenzylphthalate	50000	NA	350 U
Carbazole	NE	NA	350 U
Dibenzofuran	6200	3500 U	350 U
Di-n-butylphthalate	8100	NA	350 U
Di-n-octylphthalate	50000	NA	350 U
N-Nitrosodiphenylamine (1)	NE	NA	350 U
Metals (mg/kg)			
Aluminum	NE*	NA	934
Antimony	NE*	NA	1.5
Arsenic	7.5	5.7	1.2
Barium	300	29.7	11.9
Beryllium	0.16	NA	0.21
Cadmium	1	**1.4**	0.37
Calcium	NE*	NA	4580
Chromium	10	6.4	3.9
Cobalt	30	NA	1.2
Copper	25	NA	9.0
Iron	2000	NA	**3000**
Lead	NE*	136	30.9
Magnesium	NE*	NA	2580
Manganese	NE*	NA	34.7
Mercury	0.1	0.072	0.05
Nickel	13	NA	3.0
Potassium	NE*	NA	211
Selenium	2	0.42 U	0.62
Silver	NE*	2.3 B	0.42
Sodium	NE*	NA	123
Thallium	NE*	NA	1
Vanadium	150	NA	5.1
Zinc	20	NA	**37.8**
Total Cyanide (mg/kg)			
Cyanide, total	NE	5.5	1.43
Polychlorinated Biphenyls (PCBs) (ug/kg)			
Aroclor 1242	1000	NA	36 U
Aroclor 1254	1000	NA	36 U
Aroclor 1260	1000	NA	36 U

Table 4-35 (continued)
Surface-Soil Analytical Results
Current Electric Substation Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date	
		RPSS-04	SS-09B
		0-0.5	0.25
		RPSS-04 (0-6")	RPSS09
		01/04/2000	10/23/1995
Pesticides (ug/kg)			
4,4'-DDD	2900	NA	3.6 U
4,4'-DDE	2100	NA	3.6 U
4,4'-DDT	2100	NA	2.1 J
Aldrin	2,900	NA	1.8 U
alpha-BHC	110	NA	1.8 U
alpha-Chlordane	5400	NA	1.8 U
beta-BHC	200	NA	1.8 U
delta-BHC	300	NA	1.8 U
Dieldrin	44	NA	3.6 U
Endosulfan I	900	NA	1.8 U
Endosulfan II	900	NA	3.6 U
Endosulfan sulfate	1000	NA	3.6 U
Endrin	100	NA	3.6 U
Endrin aldehyde	NE	NA	NA
Endrin ketone	NE	NA	3.6 U
gamma-Chlordane	540	NA	1.4 J
Heptachlor	100	NA	1.8 U
Heptachlor epoxide	20	NA	1.8 U
Lindane	NE	NA	1.8 U
Methoxychlor	NE	NA	5.5 J
Toxaphene	NE	NA	180 U
TCLP			
TCLP Benzene (ug/l)			
Benzene (TCLP)	NE	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)			
o-Cresol (TCLP)	NE	NA	NA
p-Cresol (TCLP)	NE	NA	NA
TCLP Metals (ug/l)			
Arsenic (TCLP)	NE	NA	NA
Barium (TCLP)	NE	NA	NA
Cadmium (TCLP)	NE	NA	NA
Chromium (TCLP)	NE	NA	NA
Lead (TCLP)	NE	NA	NA
Selenium (TCLP)	NE	NA	NA
Silver (TCLP)	NE	NA	NA

Notes:
* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns. The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-36
Surface-Soil Analytical Results
Bulkhead Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		RPSS-01	RPSS-02	RPSS-03	RPSS-17	RPSS-18
		0-0.5	0-0.5	0-0.5	0-0.17	0-0.17
		RPSS-01 (0-6")	RPSS-02 (0-6")	RPSS-03 (0-6")	RPSS-17 (0-2")	RPSS-18 (0-2")
		02/08/2000	02/10/2000	02/16/2000	03/08/2002	03/05/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.001 U	0.001	0.001 U	0.006
Xylene (total)	1.2	0.001 U	0.002	0.003	0.008	0.002
Total BTEX		0	0.002	0.004	0.008	0.008
Other Volatile Organic Compounds (ug/kg)						
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.224	**0.29 J**	**0.26 J**	1.6 U	**3.2 J**	**1.9**
Benzo(a)pyrene	0.061	**0.28 J**	**0.25 J**	1.6 U	**1.7 J**	**1.1**
Benzo(b)fluoranthene	1.1	0.4 J	0.33 J	1.6 U	**3.4 J**	**2.3**
Benzo(k)fluoranthene	1.1	0.13 J	0.15 J	1.6 U	**1.2 J**	0.87
Chrysene	0.4	0.25 J	0.29 J	1.6 U	**4.4**	**2.3**
Dibenzo(a,h)anthracene	0.014	1.7 U	0.34 U	1.6 U	**0.59 J**	**0.2 J**
Indeno(1,2,3-cd)pyrene	3.2	1.7 U	0.23 J	1.6 U	1.7 J	0.72
Total Carcinogenic PAHs		1.35	1.51	0	16.19	9.39
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	36.4	1.7 U	0.34 U	1.6 U	0.93 J	0.12 J
Acenaphthene	50	1.7 U	0.34 U	1.6 U	3.6 U	0.078 J
Acenaphthylene	41	1.7 U	0.34 U	1.6 U	3.4 J	0.91
Anthracene	50	0.19 J	0.039 J	1.6 U	1.5 J	0.76
Benzo(g,h,i)perylene	50	1.7 U	0.24 J	1.6 U	1.5 J	0.61
Fluoranthene	50	0.45 J	0.38	0.25 J	3.8	2.2
Fluorene	50	1.7 U	0.34 U	1.6 U	3.6 U	0.15 J
Naphthalene	13	1.7 U	0.34 U	1.6 U	1.4 J	0.15 J
Phenanthrene	50	0.7 J	0.15 J	0.22 J	3.8	1.3
Pyrene	50	0.52 J	0.56	0.31 J	5.8	3.4
Total Non-Carcinogenic PAHs		1.86	1.369	0.78	22.13	9.678
Total PAHs		3.21	2.879	0.78	38.32	19.068
Other Semivolatile Organic Compounds (ug/kg)						
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA
2,4-Dimethylphenol	400	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	12000 U	13000 U	11000 U	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	6200	1700 U	340 U	1600 U	3600 U	55 J
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA

Table 4-36 (continued)
Surface-Soil Analytical Results
Bulkhead Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date				
		RPSS-01	RPSS-02	RPSS-03	RPSS-17	RPSS-18
		0-0.5	0-0.5	0-0.5	0-0.17	0-0.17
		RPSS-01 (0-6")	RPSS-02 (0-6")	RPSS-03 (0-6")	RPSS-17 (0-2")	RPSS-18 (0-2")
		02/08/2000	02/10/2000	02/16/2000	03/08/2002	03/05/2002
Metals (mg/kg)						
Aluminum	NE*	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA
Arsenic	7.5	3.6	0.61 B	1.1 B	**8.3**	3.6
Barium	300	52.9	5 B	12.8 B	37.7	19.5
Beryllium	0.16	NA	NA	NA	NA	NA
Cadmium	1	0.98	0.29 B	0.17 B	0.51	0.37
Calcium	NE*	NA	NA	NA	NA	NA
Chromium	10	4.8	2.4	5.7	6.9	5.6
Cobalt	30	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA
Lead	NE*	206	16.5	69.6	289	96.0
Magnesium	NE*	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA
Mercury	0.1	**0.48**	0.017 B	0.051	**0.15**	0.063
Nickel	13	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA
Selenium	2	0.41 U	0.39 U	0.27 U	0.52 B	0.44 U
Silver	NE*	1.5 B	0.19 U	0.29 B	0.10 U	0.11 U
Sodium	NE*	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)						
Cyanide, total	NE	0.15 B	0.16 B	0.45 B	21.3	2.8
Polychlorinated Biphenyls (PCBs) (ug/kg)						
Aroclor 1242	1000	NA	NA	NA	NA	NA
Aroclor 1254	1000	NA	NA	NA	NA	NA
Aroclor 1260	1000	NA	NA	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDD	2900	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA
TCLP						
TCLP Benzene (ug/l)						
Benzene (TCLP)	NE	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)						
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA
Metals (ug/l)						
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA

Table 4-36 (continued)
Surface-Soil Analytical Results
Bulkhead Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSS-19	RPSS-20	RPSS-21	RPSS-22	RPSS-23	RPSS-24
		0-0.17	0-0.17	0-0.17	0-0.17	0-0.17	0-0.17
		RPSS-19 (0-2")	RPSS-20 (0-2")	RPSS-21 (0-2")	RPSS-22 (0-2")	RPSS-23 (0-2")	RPSS-24 (0-2")
		03/05/2002	03/05/2002	03/08/2002	03/05/2002	03/05/2002	03/08/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethyl benzene	5.5	0.001 U	0.001 J	0.001 U	0.001 U	0.001 U	0.001 U
Toluene	1.5	0.001 U	0.016	0.001 U	0.001 U	0.001 U	0.001 U
Xylene (total)	1.2	0.001 J	0.002	0.006	0.001 U	0.001 U	0.014
Total BTEX		0.001	0.019	0.006	0	0	0.014
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	NA	NA	NA	NA	NA	NA
2-Butanone	300	NA	NA	NA	NA	NA	NA
2-Hexanone	NE	NA	NA	NA	NA	NA	NA
Acetone	200	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4-trimethyl	NE	NA	NA	NA	NA	NA	NA
Benzene, 1,3,5-trimethyl-	NE	NA	NA	NA	NA	NA	NA
Benzene, 1-methylethyl-	NE	NA	NA	NA	NA	NA	NA
Carbon disulfide	2,700	NA	NA	NA	NA	NA	NA
Chlorobenzene	1,700	NA	NA	NA	NA	NA	NA
Methylene chloride	100	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
n-Propylbenzene	NE	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NE	NA	NA	NA	NA	NA	NA
Styrene	NE	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,400	NA	NA	NA	NA	NA	NA
Trichloroethene	700	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	**1.8**	**4.4**	**8.6 D**	**0.72**	**3.2**	**5.6**
Benzo(a)pyrene	0.061	**0.92**	**2.4**	**3**	**0.48**	**1.7**	**3.7**
Benzo(b)fluoranthene	1.1	**2.2**	**3.7**	**4.8**	**1.2**	**3**	**8.2**
Benzo(k)fluoranthene	1.1	0.76	**1.2**	**1.7**	0.38	**1.1**	**2.8 J**
Chrysene	0.4	**2.2**	**4.9**	**7.6 D**	**1.1**	**3.6**	**6.8**
Dibenzo(a,h)anthracene	0.014	**0.23 J**	**0.35**	**0.38**	**0.13 J**	**0.29 J**	**1.7 J**
Indeno(1,2,3-cd)pyrene	3.2	0.65	0.98	1.3	0.39	0.84	**6.1**
Total Carcinogenic PAHs		8.76	17.93	27.38	4.4	13.73	34.9
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	0.17 J	0.3 J	0.15 J	0.094 J	0.16 J	0.64 J
Acenaphthene	50	0.054 J	0.16 J	0.38	0.034 J	0.055 J	3.4 U
Acenaphthylene	41	1.2	1.8	2.7	0.85	1.3	7.2
Anthracene	50	0.56	1.3	2.5	0.32 J	0.86	2.8 J
Benzo(g,h,i)perylene	50	0.52	0.82	0.94	0.35	0.73	6.6
Fluoranthene	50	1.8	4.3	15 D	0.9	3.3	4.7
Fluorene	50	0.36 U	0.39	1.8	0.33 U	0.36 U	3.4 U
Naphthalene	13	0.26 J	0.34 J	0.17 J	0.14 J	0.22 J	0.73 J
Phenanthrene	50	0.7	3.1	17 D	0.33 J	1.6	1.8 J
Pyrene	50	3	7.2 D	23 D	1.3	5.5	9.2
Total Non-Carcinogenic PAHs		8.264	19.71	63.64	4.318	13.725	33.67
Total PAHs		17.024	37.64	91.02	8.718	27.455	68.57
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	400	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NE	NA	NA	NA	NA	NA	NA
2-Methylphenol	1000	NA	NA	NA	NA	NA	NA
4-Methylphenol	900	NA	NA	NA	NA	NA	NA
Benzene, hydroxy-	NE	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	50000	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	50000	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	6200	65 J	90 J	220 J	330 U	56 J	3400 U
Di-n-butylphthalate	8100	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	50000	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine (1)	NE	NA	NA	NA	NA	NA	NA

Table 4-36 (continued)
Surface-Soil Analytical Results
Bulkhead Area
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Site/Depth (ft)/Sample ID/Date					
		RPSS-19	RPSS-20	RPSS-21	RPSS-22	RPSS-23	RPSS-24
		0-0.17	0-0.17	0-0.17	0-0.17	0-0.17	0-0.17
		RPSS-19 (0-2")	RPSS-20 (0-2")	RPSS-21 (0-2")	RPSS-22 (0-2")	RPSS-23 (0-2")	RPSS-24 (0-2")
		03/05/2002	03/05/2002	03/08/2002	03/05/2002	03/05/2002	03/08/2002
Metals (mg/kg)							
Aluminum	NE*	NA	NA	NA	NA	NA	NA
Antimony	NE*	NA	NA	NA	NA	NA	NA
Arsenic	7.5	6.5	6.0	**12.2**	3.7	4.5	**7.9**
Barium	300	20.9	16.0	20.4	14.2	27.7	52.9
Beryllium	0.16	NA	NA	NA	NA	NA	NA
Cadmium	1	0.26 B	0.20 B	0.37	0.50	0.35	0.46
Calcium	NE*	NA	NA	NA	NA	NA	NA
Chromium	10	5.3	3.9	6.3	4.4	9.5	**11.2**
Cobalt	30	NA	NA	NA	NA	NA	NA
Copper	25	NA	NA	NA	NA	NA	NA
Iron	2000	NA	NA	NA	NA	NA	NA
Lead	NE*	108	45.6	88.7	61.0	82.3	140
Magnesium	NE*	NA	NA	NA	NA	NA	NA
Manganese	NE*	NA	NA	NA	NA	NA	NA
Mercury	0.1	**0.3**	**0.21**	**0.14**	0.053	0.095	**0.17**
Nickel	13	NA	NA	NA	NA	NA	NA
Potassium	NE*	NA	NA	NA	NA	NA	NA
Selenium	2	0.44 U	0.40 U	0.37 U	0.35 U	0.37 U	0.36 U
Silver	NE*	0.11 U	0.10 U	0.092 U	0.088 U	0.092 U	0.089 U
Sodium	NE*	NA	NA	NA	NA	NA	NA
Thallium	NE*	NA	NA	NA	NA	NA	NA
Vanadium	150	NA	NA	NA	NA	NA	NA
Zinc	20	NA	NA	NA	NA	NA	NA
Total Cyanide (mg/kg)							
Cyanide, total	NE	1.2	1.0	1.4	6.9	3.4	7.5
Polychlorinated Biphenyls (PCBs) (ug/kg)							
Aroclor 1242	1000	NA	NA	NA	NA	NA	NA
Aroclor 1254	1000	NA	NA	NA	NA	NA	NA
Aroclor 1260	1000	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
4,4'-DDD	2900	NA	NA	NA	NA	NA	NA
4,4'-DDE	2100	NA	NA	NA	NA	NA	NA
4,4'-DDT	2100	NA	NA	NA	NA	NA	NA
Aldrin	2,900	NA	NA	NA	NA	NA	NA
alpha-BHC	110	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5400	NA	NA	NA	NA	NA	NA
beta-BHC	200	NA	NA	NA	NA	NA	NA
delta-BHC	300	NA	NA	NA	NA	NA	NA
Dieldrin	44	NA	NA	NA	NA	NA	NA
Endosulfan I	900	NA	NA	NA	NA	NA	NA
Endosulfan II	900	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1000	NA	NA	NA	NA	NA	NA
Endrin	100	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NE	NA	NA	NA	NA	NA	NA
Endrin ketone	NE	NA	NA	NA	NA	NA	NA
gamma-Chlordane	540	NA	NA	NA	NA	NA	NA
Heptachlor	100	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	20	NA	NA	NA	NA	NA	NA
Lindane	NE	NA	NA	NA	NA	NA	NA
Methoxychlor	NE	NA	NA	NA	NA	NA	NA
Toxaphene	NE	NA	NA	NA	NA	NA	NA
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	NA	NA	NA	NA	NA	NA
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
p-Cresol (TCLP)	NE	NA	NA	NA	NA	NA	NA
Metals (ug/l)							
Arsenic (TCLP)	NE	NA	NA	NA	NA	NA	NA
Barium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Cadmium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Chromium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Lead (TCLP)	NE	NA	NA	NA	NA	NA	NA
Selenium (TCLP)	NE	NA	NA	NA	NA	NA	NA
Silver (TCLP)	NE	NA	NA	NA	NA	NA	NA

Table 4-36 (continued)
Surface-Soil Analytical Results
Bulkhead Area
Rockaway Park Former MGP Site

Notes:

* site background
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
P - pesticide/PCB/herbicide compound with a greater than 25% difference for detected concentration between the two GC columns.
The lower of the two values is reported.
Shading/bolding indicates an exceedance of established New York State Recommended Soil Cleanup Objectives.
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-37
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)						
		MW-01		MW-02	MW-03		PZ-01	
		MW-01 03/07/00 6-16	MW-01 09/18/2002 6-16	MW-02 09/18/2002 5-15	MW-03 03/06/2000 4-14	MW-03 09/18/2002 4-14	RPPZ01 10/26/1995 2-12	PZ-01 03/10/2000 2-12
Volatile Organic Compounds (VOCs)								
BTEX (ug/l)								
Benzene	1	**780**	**2500 D**	**3000**	**46000**	**35000 D**	**4200**	**1400 D**
Toluene	5	50 U	2 U	**350**	**23000**	**22000 D**	**20 J**	**6**
Ethylbenzene	5	50 U	**980 D**	**780**	**1300 J**	**3900 D**	**1090**	**190 D**
Xylene (total)	5	**150**	**57 D**	**710**	**8500**	**41000 D**	**550**	**150**
Total BTEX		930	3537	4840	78800	101900	5860	1746
Other Volatile Organic Compounds (ug/l)								
1,1,2-Trichloroethane	1	50 U	NA	NA	2500 U	NA	NA	**2 J**
1,2,4-Trimethylbenzene	5	**140**	NA	NA	2500 U	NA	**180**	**44**
1,2-Dichlorobenzene	3	50 U	NA	NA	2500 U	NA	NA	5 U
1,3,5-Trimethylbenzene	5	**71**	NA	NA	2500 U	NA	NA	**9**
2-Butanone	50*	50 U	NA	NA	2500 U	NA	NA	5 U
Acetone	50*	50 U	NA	NA	2500 U	NA	NA	5 U
Chloroform	7	50 U	NA	NA	2500 U	NA	NA	5 U
Isopropylbenzene	5	50 U	NA	NA	2500 U	NA	NA	**36**
Methyl tert-butyl ether	NE	50 U	NA	NA	2500 U	NA	NA	170
Methylene chloride	5	50 U	NA	NA	2500 U	NA	NA	5 U
Styrene	5	50 U	NA	NA	**5000**	NA	10 U	3 J
cis-1,2-Dichloroethene	5	50 U	NA	NA	2500 U	NA	NA	2 J
n-Propylbenzene	5	50 U	NA	NA	2500 U	NA	NA	**10**
p-Cymene	NE	50 U	NA	NA	2500 U	NA	NA	3 J
Semivolatile Organic Compounds (SVOCs)								
Carcinogenic PAHS (ug/l)								
Benzo(a)anthracene	0.002*	10 U	100 U	50 U	500 U	400 U	**210**	10 U
Benzo(a)pyrene	ND	10 U	100 U	50 U	500 U	400 U	190	10 U
Benzo(b)fluoranthene	0.002*	10 U	100 U	50 U	500 U	400 U	**80**	10 U
Benzo(k)fluoranthene	0.002*	10 U	100 U	50 U	500 U	400 U	**120**	10 U
Chrysene	0.002*	10 U	100 U	50 U	500 U	400 U	**220**	10 U
Dibenzo(a,h)anthracene	NE	10 U	100 U	50 U	500 U	400 U	20 J	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	100 U	50 U	500 U	400 U	**80**	10 U
Total Carcinogenic PAHs		0	0	0	0	0	920	0
Non-Carcinogenic PAHS (ug/l)								
2-Methylnaphthalene	NE	24	53 J	38 J	270 J	220 J	710	10 U
Acenaphthene	20*	**100**	**120**	50 U	500 U	400 U	**790**	**140**
Acenaphthylene	NE	10 U	100 U	50 U	500 U	400 U	180	10 U
Anthracene	50*	7 J	100 U	50 U	500 U	400 U	**320**	5 J
Benzo(ghi)perylene	NE	10 U	100 U	50 U	500 U	400 U	100	10 U
Fluoranthene	50*	3 J	100 U	50 U	500 U	400 U	**340**	4 J
Fluorene	50*	**53**	**56 J**	50 U	500 U	400 U	**440**	48
Naphthalene	10*	**830 D**	**1600**	**500**	**6600**	**5700**	**4130**	**190 D**
Phenanthrene	50*	**56**	**65 J**	50 U	500 U	400 U	**1120**	**53**
Pyrene	50*	4 J	100 U	50 U	500 U	400 U	**590**	6 J
Total Non-Carcinogenic PAHs		1077	1894	538	6870	5920	8720	446
Total PAHs		1077	1894	538	6870	5920	9640	446
Other Semivolatile Organic Compounds (ug/l)								
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	1740	NA
2,4-Dimethylphenol	50*	10 U	NA	NA	**120 J**	NA	NA	1 J
2-Methylphenol	1	10 U	NA	NA	**89 J**	NA	NA	10 U
4-Methylphenol	1	10 U	NA	NA	500 U	NA	NA	10 U
Bis(2-ethylhexyl)phthalate	5	10 U	NA	NA	500 U	NA	NA	10 U
Carbazole	NE	5 J	NA	NA	500 U	NA	NA	10
Dibenzofuran	NE	5 J	100 U	50 U	500 U	400 U	50	6 J
Phenol	1	**4 J**	NA	NA	500 U	NA	NA	**14**

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)						
		MW-01		MW-02	MW-03		PZ-01	
		MW-01 03/07/00 6-16	MW-01 09/18/2002 6-16	MW-02 09/18/2002 5-15	MW-03 03/06/2000 4-14	MW-03 09/18/2002 4-14	RPPZ01 10/26/1995 2-12	PZ-01 03/10/2000 2-12
Metals (ug/l)								
Aluminum	NE	444	NA	NA	88.2 B	NA	NA	10 U*
Antimony	3	3 U	NA	NA	3 U	NA	NA	3 U
Arsenic	25	4.4 B	NA	NA	10.8 B	NA	NA	4 U
Barium	1000	94.1 B	NA	NA	33.3 B	NA	NA	33.3 B
Cadmium	5	0.64 B	NA	NA	0.4 U	NA	NA	0.4 U
Calcium	NE	131000	NA	NA	43400	NA	NA	105000
Chloride (mg/l)	NE	25	NA	NA	10	NA	NA	13
Chromium	50	3.1 B	NA	NA	19.1 B	NA	NA	2 U
Cobalt	NE	2 B	NA	NA	3.6 B	NA	NA	2.7 B
Copper	200	7.7 B	NA	NA	8.6 B	NA	NA	5 U
Iron (mg/l)	0.3	**3.41**	NA	NA	**23.2**	NA	NA	**0.506 E**
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA	NA
Lead	25	6.4 B	NA	NA	9.7 B	NA	NA	2.3 U
Magnesium	35000*	9750	NA	NA	3340	NA	NA	9970
Manganese (mg/l)	0.3	**0.435**	NA	NA	0.204	NA	NA	0.142
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA	NA
Nickel	100	0.77 B	NA	NA	8.1 B	NA	NA	2 B
Potassium	NE	3660	NA	NA	4880	NA	NA	4520
Selenium	10	4.2 B	NA	NA	4 U	NA	NA	4 U
Silver	50	2 U	NA	NA	2 U	NA	NA	2 U
Sodium	20000	13800	NA	NA	9550	NA	NA	**21500**
Thallium	0.5*	3 U	NA	NA	3 U	NA	NA	3 U
Vanadium	NE	17.2 B	NA	NA	7.9 B	NA	NA	2 B
Zinc	2000*	26.2 B	NA	NA	25.7 B	NA	NA	18 B
Natural Attenuation Parameters								
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	480	NA	NA	300	NA	NA	460
Cyanide								
Cyanide (mg/l)	0.2	**0.201**	**0.268**	0.105	0.148	0.115	**0.346**	**0.441**
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	0.254	NA
Cyanide, Free (ug/l)	NE	5.4 B	NA	NA	11.5 B	NA	NA	15.3
Total Cyanide		0.206	0.268	0.105	11.65	0.115	0.6	0.457

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)				
		PZ-02		PZ-03		
		PZ-02 03/08/2000 2-12	PZ-02 09/19/2002 2-12	PZ-03 10/26/1995 2-12	PZ-03 03/03/2000 2-12	PZ-03 09/23/2002 2-12
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	**7000 D**	**12000**	**1650**	**12**	**34**
Toluene	5	**53**	200 U	**118000**	**780 D**	**22000 D**
Ethylbenzene	5	**500 DJ**	**4200**	**5640**	**20**	**1800**
Xylene (total)	5	**1400 D**	**4400**	**24100**	**300 D**	**11000 D**
Total BTEX		8953	20600	149390	1112	34834
Other Volatile Organic Compounds (ug/l)						
1,1,2-Trichloroethane	1	5 U	NA	NA	5 U	NA
1,2,4-Trimethylbenzene	5	**260 DJ**	NA	**1600**	**24**	NA
1,2-Dichlorobenzene	3	5 U	NA	NA	5 U	NA
1,3,5-Trimethylbenzene	5	**500 D**	NA	NA	**8**	NA
2-Butanone	50*	5 U	NA	NA	5 U	NA
Acetone	50*	5 U	NA	NA	5 U	NA
Chloroform	7	5 U	NA	NA	5 U	NA
Isopropylbenzene	5	**37**	NA	NA	5 U	NA
Methyl tert-butyl ether	NE	5 U	NA	NA	5 U	NA
Methylene chloride	5	5 U	NA	NA	5 U	NA
Styrene	5	5 U	NA	**48100**	**72 D**	NA
cis-1,2-Dichloroethene	5	5 U	NA	NA	5 U	NA
n-Propylbenzene	5	5 U	NA	NA	5 U	NA
p-Cymene	NE	34	NA	NA	1 J	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	300 U	500 U	10 U	10 U	10 UJ
Benzo(a)pyrene	ND	300 U	500 U	10 U	10 U	10 UJ
Benzo(b)fluoranthene	0.002*	300 U	500 U	10 U	10 U	10 UJ
Benzo(k)fluoranthene	0.002*	300 U	500 U	10 U	10 U	10 UJ
Chrysene	0.002*	300 U	500 U	10 U	10 U	10 UJ
Dibenzo(a,h)anthracene	NE	300 U	500 U	10 U	10 U	10 UJ
Indeno(1,2,3-cd)pyrene	0.002*	300 U	500 U	10 U	10 U	10 UJ
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	1200	1000	150	6 J	11 J
Acenaphthene	20*	**250 J**	**220 J**	10 U	10 U	10 UJ
Acenaphthylene	NE	300 U	500 U	10 U	1 J	10 UJ
Anthracene	50*	32 J	500 U	20	10 U	10 UJ
Benzo(ghi)perylene	NE	300 U	500 U	10 U	10 U	10 UJ
Fluoranthene	50*	300 U	500 U	10 U	1 J	10 UJ
Fluorene	50*	**81 J**	**51 J**	10 J	2 J	10 UJ
Naphthalene	10*	**9200 D**	**7600**	**1690**	**89**	**300 DB**
Phenanthrene	50*	**110 J**	500 U	20	4 J	10 U
Pyrene	50*	34 J	500 U	10 J	2 J	10 UJ
Total Non-Carcinogenic PAHs		10907	8871	1900	105	311
Total PAHs		10907	8871	1900	105	311
Other Semivolatile Organic Compounds (ug/l)						
1-Methyl naphthalene	NE	NA	NA	70	NA	NA
2,4-Dimethylphenol	50*	300 U	NA	NA	9 J	NA
2-Methylphenol	1	300 U	NA	NA	**19**	NA
4-Methylphenol	1	300 U	NA	NA	**23**	NA
Bis(2-ethylhexyl)phthalate	5	300 U	NA	NA	1 J	NA
Carbazole	NE	300 U	NA	NA	10 U	NA
Dibenzofuran	NE	300 U	500 U	10 U	10 U	10 UJ
Phenol	1	300 U	NA	NA	10 U	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)				
		PZ-02		PZ-03		
		PZ-02 03/08/2000 2-12	PZ-02 09/19/2002 2-12	PZ-03 10/26/1995 2-12	PZ-03 03/03/2000 2-12	PZ-03 09/23/2002 2-12
Metals (ug/l)						
Aluminum	NE	1760	NA	NA	722	NA
Antimony	3	3 U	NA	NA	3 U	NA
Arsenic	25	6.2 B	NA	NA	4 U	NA
Barium	1000	142 B	NA	NA	60.8 B	NA
Cadmium	5	0.4 U	NA	NA	2 B	NA
Calcium	NE	100000	NA	NA	178000	NA
Chloride (mg/l)	NE	NA	NA	NA	28	NA
Chromium	50	6.3 B	NA	NA	4.2 B	NA
Cobalt	NE	8.4 B	NA	NA	3.4 B	NA
Copper	200	18.7 B	NA	NA	33.6	NA
Iron (mg/l)	0.3	**15.8**	NA	NA	**14.3**	**75.7**
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	7000
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	7000
Iron (Dissolved)	300	NA	NA	NA	NA	**62100**
Lead	25	**29.7**	NA	NA	**117**	NA
Magnesium	35000*	9940	NA	NA	10900	NA
Manganese (mg/l)	0.3	**0.466**	NA	NA	0.0691	0.132
Manganese (Dissolved)	300	NA	NA	NA	NA	130
Nickel	100	20.9 B	NA	NA	6.6 B	NA
Potassium	NE	3610	NA	NA	2950	NA
Selenium	10	4 U	NA	NA	4 U	NA
Silver	50	2 U	NA	NA	6.8 B	NA
Sodium	20000	14100	NA	NA	12800	NA
Thallium	0.5*	3 U	NA	NA	3 U	NA
Vanadium	NE	9.5 B	NA	NA	6.1 B	NA
Zinc	2000*	128	NA	NA	142	NA
Natural Attenuation Parameters						
Alkalinity (mg/l)	NE	NA	NA	NA	NA	170
Sulfate (mg/l)	250	NA	NA	NA	NA	**300**
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	NA	NA	NA	820	580
Cyanide						
Cyanide (mg/l)	0.2	0.156	0.142	**4.16**	**0.342 N**	**0.35 J**
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	2.64	NA	NA
Cyanide, Free (ug/l)	NE	5 B	NA	NA	12.8 B	NA
Total Cyanide		0.161	0.142	6.8	0.354	0.35

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)						
		PZ-04			PZ-05			
		RPGW-04-01 10/26/1995 2-12	PZ-04 03/09/2000 2-12	PZ-04 09/20/2002 2-12	RPGW05 10/26/1995 2-12	PZ-05 03/10/2000 2-12	PZ-05 09/20/2002 2-12	RPMWXX092002 09/20/2002 2-12 (Dup)
Volatile Organic Compounds (VOCs)								
BTEX (ug/l)								
Benzene	1	**1200 J**	**120**	**82**	**4420**	**2500 D**	**210**	1 U
Toluene	5	**35000**	**4900 D**	**320**	**80**	**20**	5	1 U
Ethylbenzene	5	**8000**	**1500 D**	**2400**	**3270**	**200 D**	**160**	1 U
Xylene (total)	5	**16000**	**4500 D**	**2600**	**3110**	**590 D**	**410**	1 U
Total BTEX		60200	11020	5402	10880	3310	785	0
Other Volatile Organic Compounds (ug/l)								
1,1,2-Trichloroethane	1	2000 U	5 U	NA	NA	5 U	NA	NA
1,2,4-Trimethylbenzene	5	**1010**	**280 D**	NA	**490**	**180 D**	NA	NA
1,2-Dichlorobenzene	3	400 U	5 U	NA	NA	5 U	NA	NA
1,3,5-Trimethylbenzene	5	NA	**120**	NA	NA	**59**	NA	NA
2-Butanone	50*	3000 U	18	NA	NA	5 U	NA	NA
Acetone	50*	3000 U	50	NA	NA	5 U	NA	NA
Chloroform	7	2000 U	5 U	NA	NA	2 J	NA	NA
Isopropylbenzene	5	NA	**66**	NA	NA	**7**	NA	NA
Methyl tert-butyl ether	NE	NA	5 U	NA	NA	5 U	NA	NA
Methylene chloride	5	2000 U	5 U	NA	NA	5 U	NA	NA
Styrene	5	**6470**	**580 D**	NA	10 U	**13**	NA	NA
cis-1,2-Dichloroethene	5	NA	5 U	NA	NA	5 U	NA	NA
n-Propylbenzene	5	NA	**14**	NA	NA	5 U	NA	NA
p-Cymene	NE	NA	5 U	NA	NA	4 J	NA	NA
Semivolatile Organic Compounds (SVOCs)								
Carcinogenic PAHS (ug/l)								
Benzo(a)anthracene	0.002*	**40**	250 U	60 U	**70**	**1 J**	50 U	40 U
Benzo(a)pyrene	ND	50	250 U	60 U	**60**	10 U	50 U	40 U
Benzo(b)fluoranthene	0.002*	**20 J**	250 U	60 U	**30**	10 U	50 U	40 U
Benzo(k)fluoranthene	0.002*	**20 J**	250 U	60 U	**40**	10 U	50 U	40 U
Chrysene	0.002*	**40**	250 U	60 U	**70**	**1 J**	50 U	40 U
Dibenzo(a,h)anthracene	NE	400 U	250 U	60 U	10 J	10 U	50 U	40 U
Indeno(1,2,3-cd)pyrene	0.002*	**20 J**	250 U	60 U	**30 J**	10 U	50 U	40 U
Total Carcinogenic PAHs		190	0	0	310	2	0	0
Non-Carcinogenic PAHS (ug/l)								
2-Methylnaphthalene	NE	860	270	30 J	760	200 DJ	130	91
Acenaphthene	20*	**70**	250 U	11 J	**400**	**55**	**48 J**	**44**
Acenaphthylene	NE	270	65 J	60 U	80	10 U	50 U	40 U
Anthracene	50*	**70**	250 U	60 U	**120**	7 J	7 J	6 J
Benzo(ghi)perylene	NE	30	250 U	60 U	30	10 U	50 U	40 U
Fluoranthene	50*	**80**	250 U	60 U	**160**	4 J	50 U	6 J
Fluorene	50*	**110**	38 J	6 J	**190**	26	25 J	22 J
Naphthalene	10*	**8080**	**2900**	**910**	**4490**	**1400 D**	**710**	**540**
Phenanthrene	50*	**260**	**63 J**	14 J	**460**	35	42 J	30 J
Pyrene	50*	**120**	250 U	60 U	**210**	6 J	14 J	13 J
Total Non-Carcinogenic PAHs		9950	3336	971	6900	1733	976	752
Total PAHs		10140	3336	971	7210	1735	976	752
Other Semivolatile Organic Compounds (ug/l)								
1-Methyl naphthalene	NE	530	NA	NA	640	NA	NA	NA
2,4-Dimethylphenol	50*	400 U	250 U	NA	NA	2 J	NA	NA
2-Methylphenol	1	400 U	250 U	NA	NA	10 U	NA	NA
4-Methylphenol	1	400 U	**47 J**	NA	NA	10 U	NA	NA
Bis(2-ethylhexyl)phthalate	5	400 U	250 U	NA	NA	10 U	NA	NA
Carbazole	NE	400 U	250 U	NA	NA	3 J	NA	NA
Dibenzofuran	NE	10	250 U	60 U	40	5 J	50 U	40 U
Phenol	1	400 U	250 U	NA	NA	**15**	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)						
		PZ-04			PZ-05			
		RPGW-04-01 10/26/1995 2-12	PZ-04 03/09/2000 2-12	PZ-04 09/20/2002 2-12	RPGW05 10/26/1995 2-12	PZ-05 03/10/2000 2-12	PZ-05 09/20/2002 2-12	RPMWXX092002 09/20/2002 2-12 (Dup)
Metals (ug/l)								
Aluminum	NE	NA	40 B	NA	NA	10 U*	NA	NA
Antimony	3	NA	3 U	NA	NA	3 U	NA	NA
Arsenic	25	NA	12.6	NA	NA	4.1 B	NA	NA
Barium	1000	NA	65.8 B	NA	NA	157 B	NA	NA
Cadmium	5	NA	0.4 U	NA	NA	0.4 U	NA	NA
Calcium	NE	NA	78100	NA	NA	95100	NA	NA
Chloride (mg/l)	NE	NA	34	NA	NA	23	NA	NA
Chromium	50	NA	2.2 B	NA	NA	2 U	NA	NA
Cobalt	NE	NA	0.37 B	NA	NA	2.8 B	NA	NA
Copper	200	NA	5 U	NA	NA	5 U	NA	NA
Iron (mg/l)	0.3	NA	**5.96**	NA	NA	**35.1 E**	NA	NA
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA	NA
Lead	25	NA	11.2	NA	NA	4.2 B	NA	NA
Magnesium	35000*	NA	9910	NA	NA	10600	NA	NA
Manganese (mg/l)	0.3	NA	0.108	NA	NA	0.282	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA	NA
Nickel	100	NA	4.4 B	NA	NA	8.7 B	NA	NA
Potassium	NE	NA	3380	NA	NA	4190	NA	NA
Selenium	10	NA	4 U	NA	NA	4 U	NA	NA
Silver	50	NA	2 U	NA	NA	2.5 B	NA	NA
Sodium	20000	NA	**21000**	NA	NA	9990	NA	NA
Thallium	0.5*	NA	3 U	NA	NA	3 U	NA	NA
Vanadium	NE	NA	1.9 B	NA	NA	4.4 B	NA	NA
Zinc	2000*	NA	4 U	NA	NA	242	NA	NA
Natural Attenuation Parameters								
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	NA	400	NA	NA	430	NA	NA
Cyanide								
Cyanide (mg/l)	0.2	0.036	0.0463	0.0234	0.176	0.0916	0.0261	0.0268
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	0.035	NA	NA	0.198	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	4 U	NA	NA	6 B	NA	NA
Total Cyanide		0.071	0.0463	0.0234	0.374	0.092	0.0261	0.0268

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		PZ-06			PZ-07	PZ-08	
		RPPZ06 10/26/1995 2-12	PZ-06 03/08/2000 2-12	PZ-06 09/17/2002 2-12	PZ-07 03/08/2000 2-12	RPPZ08 10/26/1995 2-12	PZ-08 11/16/2001 2-12
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	**20 J**	**6**	1	5 U	**5550**	**6400**
Toluene	5	**110**	**56**	**18**	5 U	**2450**	**170 J**
Ethylbenzene	5	**30**	**88**	1 U	5 U	**4220**	**700**
Xylene (total)	5	**330**	**970 D**	**220**	5 U	**10040**	**3800**
Total BTEX		490	1120	239	0	22260	11070
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	NA	5 U	NA	5 U	NA	200 U
1,2,4-Trimethylbenzene	5	**30 J**	**110**	NA	5 U	**3950**	NA
1,2-Dichlorobenzene	3	NA	5 U	NA	5 U	NA	10 U
1,3,5-Trimethylbenzene	5	NA	**37**	NA	5 U	NA	NA
2-Butanone	50*	NA	5 U	NA	5 U	NA	200 U
Acetone	50*	NA	5 U	NA	5 U	NA	200 U
Chloroform	7	NA	5 U	NA	5 U	NA	200 U
Isopropylbenzene	5	NA	2 J	NA	5 U	NA	NA
Methyl tert-butyl ether	NE	NA	5 U	NA	5 U	NA	NA
Methylene chloride	5	NA	5 U	NA	5 U	NA	200 U
Styrene	5	**70**	**340 D**	NA	5 U	10 U	200 U
cis-1,2-Dichloroethene	5	NA	5 U	NA	5 U	NA	200 U
n-Propylbenzene	5	NA	5 U	NA	5 U	NA	NA
p-Cymene	NE	NA	5 U	NA	5 U	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	100 U	200 U	10 U	**1350**	**3 J**
Benzo(a)pyrene	ND	10 U	100 U	200 U	10 U	790	2 J
Benzo(b)fluoranthene	0.002*	10 U	100 U	200 U	10 U	**460**	**2 J**
Benzo(k)fluoranthene	0.002*	10 U	100 U	200 U	10 U	**550**	**1 J**
Chrysene	0.002*	10 U	100 U	200 U	10 U	**1470**	**3 J**
Dibenzo(a,h)anthracene	NE	10 U	100 U	200 U	10 U	130	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	100 U	200 U	10 U	**410**	10 U
Total Carcinogenic PAHs		0	0	0	0	5160	11
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	170	300	410	10 U	17700	470 D
Acenaphthene	20*	20 J	100 U	200 U	10 U	**4690**	**40**
Acenaphthylene	NE	20 J	33 J	24 J	10 U	6920	5 J
Anthracene	50*	10 J	100 U	200 U	10 U	**9860**	10
Benzo(ghi)perylene	NE	10 U	100 U	200 U	10 U	600	10 U
Fluoranthene	50*	10 U	100 U	200 U	10 U	**1720**	7 J
Fluorene	50*	20 J	15 J	200 U	10 U	**4590**	36
Naphthalene	10*	**1310**	**1300**	**2000**	10 U	**38900**	**3600 D**
Phenanthrene	50*	30	12 J	200 U	10 U	**7720**	45
Pyrene	50*	10 J	100 U	200 U	10 U	**4490**	11
Total Non-Carcinogenic PAHs		1590	1660	2434	0	97190	4224
Total PAHs		1590	1660	2434	0	102350	4235
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	120	NA	NA	NA	10700	NA
2,4-Dimethylphenol	50*	NA	100 U	NA	10 U	NA	10 U
2-Methylphenol	1	NA	100 U	NA	10 U	NA	**16**
4-Methylphenol	1	NA	100 U	NA	10 U	NA	10 U
Bis(2-ethylhexyl)phthalate	5	NA	100 U	NA	10 U	NA	10 U
Carbazole	NE	NA	100 U	NA	10 U	NA	5 J
Dibenzofuran	NE	10 J	100 U	200 U	10 U	490	6 J
Phenol	1	NA	100 U	NA	10 U	NA	**15**

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		PZ-06			PZ-07	PZ-08	
		RPPZ06 10/26/1995 2-12	PZ-06 03/08/2000 2-12	PZ-06 09/17/2002 2-12	PZ-07 03/08/2000 2-12	RPPZ08 10/26/1995 2-12	PZ-08 11/16/2001 2-12
Metals (ug/l)							
Aluminum	NE	NA	1290	NA	182 B	NA	8 U
Antimony	3	NA	3 U	NA	3 U	NA	1 U
Arsenic	25	NA	6.3 B	NA	9.1 B	NA	4 B
Barium	1000	NA	7.2 B	NA	19.2 B	NA	45.6 B
Cadmium	5	NA	0.4 U	NA	0.4 U	NA	0.58 B
Calcium	NE	NA	37800	NA	87500	NA	124000
Chloride (mg/l)	NE	NA	90	NA	24	NA	13
Chromium	50	NA	2 U	NA	2 U	NA	6.6 B
Cobalt	NE	NA	5.4 B	NA	1.7 B	NA	3.9 B
Copper	200	NA	5 U	NA	5 U	NA	4.4 B
Iron (mg/l)	0.3	NA	**0.487**	NA	**9.60**	NA	**10.5**
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	NA	2.3 U	NA	4.7 B	NA	2 U
Magnesium	35000*	NA	6920	NA	5970	NA	16200
Manganese (mg/l)	0.3	NA	0.153	NA	0.0358 B	NA	**1.05**
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Nickel	100	NA	15.3 B	NA	3.3 B	NA	2.2 B
Potassium	NE	NA	1930 B	NA	1960 B	NA	6700
Selenium	10	NA	4 U	NA	4 U	NA	6.8 B
Silver	50	NA	2 U	NA	2 U	NA	1 U
Sodium	20000	NA	**56100**	NA	13900	NA	14600
Thallium	0.5*	NA	3 U	NA	3 U	NA	2 U
Vanadium	NE	NA	0.5 U	NA	5.2 B	NA	5.6 B
Zinc	2000*	NA	200	NA	17.2 B	NA	6.7 B
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	NA	420	NA	420	NA	480
Cyanide							
Cyanide (mg/l)	0.2	**0.432**	**0.374**	**0.34**	**0.37**	**2.09**	**0.748**
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	0.331	NA	NA	NA	1.78	NA
Cyanide, Free (ug/l)	NE	NA	8 B	NA	8 B	NA	19 B
Total Cyanide		0.763	8.374	0.34	0.378	3.87	0.768

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		MW-A		RPGP-01	RPGP-02	RPGP-03	RPGP-04
		MW-A 03/07/2000 6-16	MW-A 09/19/2002 6-16	RPGP-01 (6-10) 02/08/2000 6-10	RPGP-02 (6-10) 02/22/2000 6-10	RPGP-03 (6-10) 02/15/2000 6-10	RPGP-04 (6-10) 02/03/2000 6-10
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	**5100**	**4700 D**	1 U	1 U	**3**	1
Toluene	5	500 U	20 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	**1500**	**1600**	1 U	1 U	2	1 U
Xylene (total)	5	**1300**	**630**	1 U	1 U	1 U	1
Total BTEX		7900	6930	0	0	5	2
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	5	**180 J**	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	3	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	**100 J**	NA	NA	NA	NA	NA
2-Butanone	50*	NA	NA	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA	NA	NA
Isopropylbenzene	5	500 U	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NE	500 U	NA	NA	NA	NA	NA
Methylene chloride	5	NA	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA
n-Propylbenzene	5	500 U	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	200 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	200 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	200 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	200 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	200 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	NE	250 U	200 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	700 D	160 J	10 U	10 U	2 J	10 U
Acenaphthene	20*	**140**	**220**	10 U	10 U	7 J	2 J
Acenaphthylene	NE	10 U	200 U	10 U	10 U	10 U	10 U
Anthracene	50*	14	200 U	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	NA	NA	10 U	10 U	10 U	10 U
Fluoranthene	50*	5 J	200 U	10 U	10 U	10 U	10 U
Fluorene	50*	**52**	**56 J**	10 U	10 U	10 U	10 U
Naphthalene	10*	**5000**	**3000**	10 U	10 U	5 J	3 J
Phenanthrene	50*	**61**	**60 J**	10 U	10 U	1 J	10 U
Pyrene	50*	6 J	200 U	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		5978	3496	0	0	15	5
Total PAHs		5978	3496	0	0	15	5
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	**3 J**	NA	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	10 U	NA	NA	NA	NA	NA
Carbazole	NE	20	NA	NA	NA	NA	NA
Dibenzofuran	NE	6 J	200 U	10 U	10 U	10 U	10 U
Phenol	1	**21**	NA	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		MW-A		RPGP-01	RPGP-02	RPGP-03	RPGP-04
		MW-A 03/07/2000 6-16	MW-A 09/19/2002 6-16	RPGP-01 (6-10) 02/08/2000 6-10	RPGP-02 (6-10) 02/22/2000 6-10	RPGP-03 (6-10) 02/15/2000 6-10	RPGP-04 (6-10) 02/03/2000 6-10
Metals (ug/l)							
Aluminum	NE	NA	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA	NA
Arsenic	25	5.8 B	NA	NA	NA	NA	NA
Barium	1000	34.6 B	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA	NA
Calcium	NE	0.82 B	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	95400	NA	NA	NA	NA	NA
Chromium	50	27	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA	NA
Copper	200	0.73 B	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	5.8 B	NA	NA	NA	NA	NA
Ferrous Iron (mg/l)	NE	**10.8**	**4.53**	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	7430	NA	NA	NA	NA	NA
Magnesium	35000*	**0.435**	0.291	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA
Potassium	NE	3680	NA	NA	NA	NA	NA
Selenium	10	5.7 B	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA	NA
Sodium	20000	15100	NA	NA	NA	NA	NA
Thallium	0.5*	**3.1 B**	NA	NA	NA	NA	NA
Vanadium	NE	4.4 B	NA	NA	NA	NA	NA
Zinc	2000*	12.6 B	NA	NA	NA	NA	NA
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	290	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	380	NA	NA	NA	NA	NA
Cyanide							
Cyanide (mg/l)	0.2	0.11	0.104	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA	NA
Total Cyanide		0.11	0.104	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPGP-05	RPGP-06	RPGP-07	RPGP-08	RPGP-09	RPGP-10
		RPGP-05 (6-10) 02/02/2000 6-10	RPGP-06 (6-10) 02/01/2000 6-10	RPGP-07 (6-10) 02/01/2000 6-10	RPGP-08 (6-10) 01/28/2000 6-10	RPGP-09 (6-10) 01/24/2000 6-10	RPGP-10 (6-10) 02/24/2000 6-10
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	**2600**	1000 U	1 U	1 U	1 U	1 U
Toluene	5	100 U	**2700**	1 U	1 U	1 U	1 U
Ethylbenzene	5	**300**	**9900**	1 U	1 U	1 U	1 U
Xylene (total)	5	**190**	**6000**	1 U	1 U	1 U	1 U
Total BTEX		3090	18600	0	0	0	0
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	NA	1000 U	NA	NA	NA	NA
1,2,4-Trimethylbenzene	5	NA	**330 J**	NA	NA	NA	NA
1,2-Dichlorobenzene	3	NA	1000 U	**10**	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	1000 U	NA	NA	NA	NA
2-Butanone	50*	NA	5	5	NA	NA	NA
Acetone	50*	NA	1000 U	NA	NA	NA	NA
Chloroform	7	NA	5	5	NA	NA	NA
Isopropylbenzene	5	NA	1000 U	NA	NA	NA	NA
Methyl tert-butyl ether	NE	NA	1000 U	NA	NA	NA	NA
Methylene chloride	5	NA	1000 U	NA	NA	NA	NA
Styrene	5	NA	1000 U	NA	NA	NA	NA
cis-1,2-Dichloroethene	5	NA	1000 U	NA	NA	NA	NA
n-Propylbenzene	5	NA	1000 U	NA	NA	NA	NA
p-Cymene	NE	NA	1000 U	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	50 U	10 U	10 U	**2 J**	**1 J**
Benzo(a)pyrene	ND	10 U	50 U	10 U	10 U	1 J	10 U
Benzo(b)fluoranthene	0.002*	10 U	50 U	10 U	10 U	**2 J**	**2 J**
Benzo(k)fluoranthene	0.002*	10 U	50 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	50 U	10 U	10 U	**2 J**	**1 J**
Dibenzo(a,h)anthracene	NE	10 U	50 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	50 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	7	4
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	10 U	120	10 U	10 U	10 U	10 U
Acenaphthene	20*	2 J	**54**	10 U	10 U	10 U	10 U
Acenaphthylene	NE	10 U	40 J	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	12 J	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	50 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	50 U	10 U	10 U	3 J	1 J
Fluorene	50*	10 U	25 J	10 U	10 U	10 U	10 U
Naphthalene	10*	**62**	**720**	10 U	10 U	10 U	10 U
Phenanthrene	50*	10 U	35 J	10 U	10 U	2 J	10 U
Pyrene	50*	10 U	6 J	10 U	10 U	3 J	1 J
Total Non-Carcinogenic PAHs		64	1012	0	0	8	2
Total PAHs		64	1012	0	0	15	6
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	NA	50 U	10	NA	NA	NA
2-Methylphenol	1	NA	50 U	**33**	NA	NA	NA
4-Methylphenol	1	NA	50 U	**33**	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	50 U	**10**	NA	NA	NA
Carbazole	NE	NA	50 U	10	NA	NA	NA
Dibenzofuran	NE	10 U	50 U	10 U	10 U	10 U	10 U
Phenol	1	NA	50 U	**10**	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPGP-05	RPGP-06	RPGP-07	RPGP-08	RPGP-09	RPGP-10
		RPGP-05 (6-10) 02/02/2000 6-10	RPGP-06 (6-10) 02/01/2000 6-10	RPGP-07 (6-10) 02/01/2000 6-10	RPGP-08 (6-10) 01/28/2000 6-10	RPGP-09 (6-10) 01/24/2000 6-10	RPGP-10 (6-10) 02/24/2000 6-10
Metals (ug/l)							
Aluminum	NE	NA	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA	NA
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA	NA	NA
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide							
Cyanide (mg/l)	0.2	NA	NA	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPGP-11	RPGP-12	RPGP-13	RPGP-14	RPGP-15	RPGP-16
		RPGP-11 (6-10) 03/03/2000 6-10	RPGP-12 (6-10) 02/14/2000 6-10	RPGP-13 (6-10) 02/04/2000 6-10	RPGP-14 (6-10) 01/27/2000 6-10	RPGP-15(6-10) 01/26/2000 6-10	RPGP-16 (11-15) 01/11/2000 11-15
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U	1
Xylene (total)	5	1 U	1 U	1 U	1 U	1 U	2
Total BTEX		0	0	0	0	0	3
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	3	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA	NA	NA
2-Butanone	50*	NA	NA	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NE	NA	NA	NA	NA	NA	NA
Methylene chloride	5	NA	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	NE	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0	0	0	0
Total PAHs		0	0	0	0	0	0
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	NA	NA	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	1	NA	NA	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPGP-11	RPGP-12	RPGP-13	RPGP-14	RPGP-15	RPGP-16
		RPGP-11 (6-10) 03/03/2000 6-10	RPGP-12 (6-10) 02/14/2000 6-10	RPGP-13 (6-10) 02/04/2000 6-10	RPGP-14 (6-10) 01/27/2000 6-10	RPGP-15(6-10) 01/26/2000 6-10	RPGP-16 (11-15) 01/11/2000 11-15
Metals (ug/l)							
Aluminum	NE	NA	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA	NA
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA	NA	NA
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide							
Cyanide (mg/l)	0.2	NA	NA	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPGP-17	RPGP-18	RPGP-19	RPGP-20	RPGP-21	RPGP-22
		RPGP-17(6-10) 11/19/2001 6-10	RPGP-18(8-12) 11/15/2001 8-12	RPGP-19(6-10) 11/15/2001 6-10	RPGP-20(6-10) 11/16/2001 6-10	RPGP-21(8-12) 11/19/2001 8-12	RPGP-22(8-12) 11/20/2001 8-12
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	**1100**	1 U	1 U	**46**	1 U	**81**
Toluene	5	**1000**	1 U	1 U	2	1 U	2 U
Ethylbenzene	5	**4900**	2	1 U	**60**	1 U	**43**
Xylene (total)	5	**5800**	2	1 U	**21**	1 U	4
Total BTEX		12800	4	0	129	0	128
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	3	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA	NA	NA
2-Butanone	50*	NA	NA	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NE	NA	NA	NA	NA	NA	NA
Methylene chloride	5	NA	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	**87**	**2 J**	10 U	**80**	**4 J**	10 U
Benzo(a)pyrene	ND	70	2 J	10 U	62	3 J	10 U
Benzo(b)fluoranthene	0.002*	**84**	**1 J**	10 U	**45**	**5 J**	10 U
Benzo(k)fluoranthene	0.002*	**36**	10 U	10 U	**12 J**	**2 J**	10 U
Chrysene	0.002*	**93**	**3 J**	10 U	**80**	**5 J**	10 U
Dibenzo(a,h)anthracene	NE	12	10 U	10 U	8 J	1 J	10 U
Indeno(1,2,3-cd)pyrene	0.002*	**39**	10 U	10 U	**25 J**	**3 J**	10 U
Total Carcinogenic PAHs		421	8	0	312	23	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	64	10 U	10 U	40 U	2 J	7 J
Acenaphthene	20*	14	10 U	10 U	**260**	2 J	**30**
Acenaphthylene	NE	20	10 U	10 U	48	5 J	1 J
Anthracene	50*	**82**	10 U	10 U	**140**	2 J	2 J
Benzo(ghi)perylene	NE	35	10 U	10 U	33 J	3 J	10 U
Fluoranthene	50*	**200 D**	1 J	10 U	**120**	6 J	1 J
Fluorene	50*	41	10 U	10 U	40 U	1 J	2 J
Naphthalene	10*	**1400 D**	10 U	10 U	**42**	6 J	**100**
Phenanthrene	50*	**230 D**	2 J	10 U	**560**	4 J	6 J
Pyrene	50*	**160**	5 J	10 U	**260**	10	3 J
Total Non-Carcinogenic PAHs		2246	8	0	1463	41	152
Total PAHs		2667	16	0	1775	64	152
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	NA	NA	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA	NA
Dibenzofuran	NE	32	10 U	10 U	40	1 J	10 U
Phenol	1	NA	NA	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPGP-17	RPGP-18	RPGP-19	RPGP-20	RPGP-21	RPGP-22
		RPGP-17(6-10) 11/19/2001 6-10	RPGP-18(8-12) 11/15/2001 8-12	RPGP-19(6-10) 11/15/2001 6-10	RPGP-20(6-10) 11/16/2001 6-10	RPGP-21(8-12) 11/19/2001 8-12	RPGP-22(8-12) 11/20/2001 8-12
Metals (ug/l)							
Aluminum	NE	NA	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA	NA
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA	NA	NA
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide							
Cyanide (mg/l)	0.2	NA	NA	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)				
		RPGP-23	RPGP-24	RPGP-26	RPGP-27	RPGP-28A
		RPGP-23(8-12) 11/26/2001 8-12	RPGP-24(8-12) 11/26/2001 8-12	RPGP26-GW8-12 07/19/2002 8-12	RPGP-27GW8-12 07/22/2002 8-12	RPGP28A-GW8-12 07/24/2002 8-12
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	**16**	1 U	1 U	**3400**	1 U
Toluene	5	1 U	1 U	1 U	40 U	1 U
Ethylbenzene	5	**14**	1 U	1 U	**770**	1 U
Xylene (total)	5	1 U	1 U	2	**100**	1 U
Total BTEX		30	0	2	4270	0
Other Volatile Organic Compounds (ug/l)						
1,1,2-Trichloroethane	1	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	3	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA	NA
2-Butanone	50*	NA	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NE	NA	NA	NA	NA	NA
Methylene chloride	5	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	**10 J**	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	NE	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		10	0	0	0	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	7 J	10 U	10 U	10 U	10 U
Acenaphthene	20*	8 J	10 U	10 U	1 J	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U	10 U
Naphthalene	10*	**49**	10 U	10 U	**79**	10 U
Phenanthrene	50*	1 J	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		65	0	0	80	0
Total PAHs		75	0	0	80	0
Other Semivolatile Organic Compounds (ug/l)						
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	NA	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	10 U
Phenol	1	NA	NA	NA	NA	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)				
		RPGP-23	RPGP-24	RPGP-26	RPGP-27	RPGP-28A
		RPGP-23(8-12) 11/26/2001 8-12	RPGP-24(8-12) 11/26/2001 8-12	RPGP26-GW8-12 07/19/2002 8-12	RPGP-27GW8-12 07/22/2002 8-12	RPGP28A-GW8-12 07/24/2002 8-12
Metals (ug/l)						
Aluminum	NE	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA	NA
Natural Attenuation Parameters						
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	NA	NA	NA	NA	NA
Cyanide						
Cyanide (mg/l)	0.2	NA	NA	NA	NA	**4.67 J**
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA	4.67

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPMW-01S		RPMW-02S		RPMW-03S	
		RPMW-01S 03/15/2000 5-15	RPMW-01S 09/20/2002 5-15	RPMW-02S 03/15/2000 5-15	RPMW-02S 09/24/2002 5-15	RPMW-03S 03/15/2000 5-15	RPMW-03S 09/20/2002 5-15
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	5 U	1 U	5 U	**500**	5 U	**26**
Toluene	5	5 U	1 U	5 U	10 U	5 U	1
Ethylbenzene	5	5 U	1 U	5 U	**100**	5 U	2
Xylene (total)	5	5 U	1 U	**7**	**23**	5 U	3
Total BTEX		0	0	7	623	0	32
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	5 U	NA	5 U	NA	5 U	NA
1,2,4-Trimethylbenzene	5	5 U	NA	5 U	NA	1 J	NA
1,2-Dichlorobenzene	3	5 U	NA	5 U	NA	5 U	NA
1,3,5-Trimethylbenzene	5	5 U	NA	4 J	NA	5 U	NA
2-Butanone	50*	5 U	NA	5 U	NA	5 U	NA
Acetone	50*	5 U	NA	5 U	NA	5 U	NA
Chloroform	7	5 U	NA	5 U	NA	5 U	NA
Isopropylbenzene	5	5 U	NA	5 U	NA	**10**	NA
Methyl tert-butyl ether	NE	5 U	NA	5 U	NA	5 U	NA
Methylene chloride	5	5 U	NA	5 U	NA	5 U	NA
Styrene	5	5 U	NA	5 U	NA	5 U	NA
cis-1,2-Dichloroethene	5	5 U	NA	5 U	NA	5 U	NA
n-Propylbenzene	5	5 U	NA	5 U	NA	5 U	NA
p-Cymene	NE	5 U	NA	3 J	NA	5 U	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	10 U	40 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	40 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	40 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	40 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	40 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	NE	10 U	10 U	40 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	40 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	10 U	10 U	40 U	20	10 U	10 U
Acenaphthene	20*	10 U	10 U	**96**	200 D	**26**	**28**
Acenaphthylene	NE	10 U	10 U	200	6 J	10 U	10 U
Anthracene	50*	10 U	10 U	14 J	11	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	40 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	8 J	9 J	10 U	10 U
Fluorene	50*	10 U	10 U	**82**	**56**	10 U	10 U
Naphthalene	10*	5 U	10 U	5 U	**590 D**	5 U	4 J
Phenanthrene	50*	10 U	10 U	**120**	**91**	10 U	10 U
Pyrene	50*	10 U	10 U	11 J	10	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	531	993	26	32
Total PAHs		0	0	531	993	26	32
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	10 U	NA	40 U	NA	10 U	NA
2-Methylphenol	1	10 U	NA	40 U	NA	10 U	NA
4-Methylphenol	1	10 U	NA	40 U	NA	10 U	NA
Bis(2-ethylhexyl)phthalate	5	10 U	NA	40 U	NA	10 U	NA
Carbazole	NE	10 U	NA	11 J	NA	10 U	NA
Dibenzofuran	NE	10 U	10 U	10 J	8 J	10 U	10 U
Phenol	1	10 U	NA	40 U	NA	10 U	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPMW-01S		RPMW-02S		RPMW-03S	
		RPMW-01S 03/15/2000 5-15	RPMW-01S 09/20/2002 5-15	RPMW-02S 03/15/2000 5-15	RPMW-02S 09/24/2002 5-15	RPMW-03S 03/15/2000 5-15	RPMW-03S 09/20/2002 5-15
Metals (ug/l)							
Aluminum	NE	28.4 B	NA	10 U	NA	55.9 B	NA
Antimony	3	**7 B**	NA	3 U	NA	3 U	NA
Arsenic	25	8.3 B	NA	6.6 B	NA	16.2	NA
Barium	1000	14.9 B	NA	29.8 BE	NA	11.5 B	NA
Cadmium	5	0.9 B	NA	0.43 B	NA	0.47 B	NA
Calcium	NE	293000	NA	159000	NA	116000	NA
Chloride (mg/l)	NE	17000	NA	5500	NA	3000	NA
Chromium	50	2 U	NA	2 U	NA	2 U	NA
Cobalt	NE	6.6 B	NA	2.1 B	NA	1.7 B	NA
Copper	200	5 U	NA	5 U	NA	5 U	NA
Iron (mg/l)	0.3	0.0536 B	NA	**0.483 E**	**0.307**	0.137 B	NA
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	293	NA	NA
Lead	25	2.3 U	NA	2.3 U	NA	2.3 U	NA
Magnesium	35000*	**658000**	NA	**220000 E**	NA	**159000**	NA
Manganese (mg/l)	0.3	0.0066 B	NA	**0.664 E**	0.0788 E	0.0591	NA
Manganese (Dissolved)	300	NA	NA	NA	75.1 E	NA	NA
Nickel	100	19.4 B	NA	7.3 B	NA	3 B	NA
Potassium	NE	483000	NA	129000 E	NA	102000	NA
Selenium	10	6.3 B	NA	4 U	NA	4 B	NA
Silver	50	7.4 B	NA	2 U	NA	2 U	NA
Sodium	20000	**9080000**	NA	**2420000**	NA	**1570000**	NA
Thallium	0.5*	15.6	NA	**5.8 B**	NA	**4.7 B**	NA
Vanadium	NE	384	NA	295 E	NA	266	NA
Zinc	2000*	121	NA	4 U	NA	4 U	NA
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	NA	NA	420	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	40	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	26000	NA	9300	NA	5400	NA
Cyanide							
Cyanide (mg/l)	0.2	0.004 U	0.038	0.176	0.066	0.159	0.0682
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4 U	NA	4 U	NA
Total Cyanide		0	0.038	0.176	0.066	0.159	0.0682

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPMW-04S		RPMW-05S		RPMW-07S	
		RPMW-04S 03/08/2000 5-15	RPMW-04S 09/20/2002 5-15	RPMW-05S 03/10/2000 5-15	RPMW-05S 09/17/2002 5-15	RPMW-07S 03/13/2000 1.5-11.5	RPMW-07S 09/24/2002 1.5-11.5
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	5 U	**4**	**3200 D**	**3200 D**	**890**	**2900**
Toluene	5	5 U	1 U	**7**	1 U	400 U	50 U
Ethylbenzene	5	5 U	2	**130 D**	**200 D**	400 U	**1100**
Xylene (total)	5	5 U	2	**350**	**60**	**320 J**	**400**
Total BTEX		0	8	3687	3460	1210	4400
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	5 U	NA	5 U	NA	400 U	NA
1,2,4-Trimethylbenzene	5	5 U	NA	**96**	NA	**90 J**	NA
1,2-Dichlorobenzene	3	5 U	NA	5 U	NA	400 U	NA
1,3,5-Trimethylbenzene	5	5 U	NA	**14**	NA	400 U	NA
2-Butanone	50*	5 U	NA	5 U	NA	400 U	NA
Acetone	50*	5 U	NA	5 U	NA	400 U	NA
Chloroform	7	5 U	NA	5 U	NA	400 U	NA
Isopropylbenzene	5	5 U	NA	**18**	NA	400 U	NA
Methyl tert-butyl ether	NE	5 U	NA	5 U	NA	400 U	NA
Methylene chloride	5	5 U	NA	5 U	NA	400 U	NA
Styrene	5	5 U	NA	**8**	NA	400 U	NA
cis-1,2-Dichloroethene	5	5 U	NA	5 U	NA	400 U	NA
n-Propylbenzene	5	5 U	NA	5 U	NA	400 U	NA
p-Cymene	NE	5 U	NA	4 J	NA	400 U	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	10 U	250 U	150 U	1000 U	500 U
Benzo(a)pyrene	ND	10 U	10 U	250 U	150 U	1000 U	500 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	250 U	150 U	1000 U	500 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	250 U	150 U	1000 U	500 U
Chrysene	0.002*	10 U	10 U	250 U	150 U	1000 U	500 U
Dibenzo(a,h)anthracene	NE	10 U	10 U	250 U	150 U	1000 U	500 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	250 U	150 U	1000 U	500 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	10 U	10 U	160 J	52 J	990 J	480 J
Acenaphthene	20*	2 J	10 U	250 U	**180**	**300 J**	**230 J**
Acenaphthylene	NE	3 J	10 U	250 U	150 U	1000 U	500 U
Anthracene	50*	10 U	10 U	250 U	150 U	1000 U	500 U
Benzo(ghi)perylene	NE	10 U	10 U	250 U	150 U	1000 U	500 U
Fluoranthene	50*	10 U	10 U	250 U	150 U	1000 U	500 U
Fluorene	50*	10 U	10 U	**79 J**	**80 J**	**130 J**	**92 J**
Naphthalene	10*	5 U	10	**3100**	**1200**	**7600**	**4500**
Phenanthrene	50*	10 U	10 U	**93 J**	**120 J**	**160 J**	**96 J**
Pyrene	50*	10 U	10 U	250 U	150 U	1000 U	500 U
Total Non-Carcinogenic PAHs		5	10	3432	1632	9180	5398
Total PAHs		5	10	3432	1632	9180	5398
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	10 U	NA	250 U	NA	1000 U	NA
2-Methylphenol	1	10 U	NA	250 U	NA	1000 U	NA
4-Methylphenol	1	10 U	NA	250 U	NA	1000 U	NA
Bis(2-ethylhexyl)phthalate	5	10 U	NA	250 U	NA	1000 U	NA
Carbazole	NE	10 U	NA	250 U	NA	1000 U	NA
Dibenzofuran	NE	10 U	10 U	250 U	150 U	1000 U	500 U
Phenol	1	10 U	NA	250 U	NA	1000 U	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPMW-04S		RPMW-05S		RPMW-07S	
		RPMW-04S 03/08/2000 5-15	RPMW-04S 09/20/2002 5-15	RPMW-05S 03/10/2000 5-15	RPMW-05S 09/17/2002 5-15	RPMW-07S 03/13/2000 1.5-11.5	RPMW-07S 09/24/2002 1.5-11.5
Metals (ug/l)							
Aluminum	NE	10 U	NA	412 E*	NA	215 B	NA
Antimony	3	3 U	NA	3 U	NA	3 U	NA
Arsenic	25	4 U	NA	4 U	NA	4 U	NA
Barium	1000	6.3 B	NA	27.4 B	NA	46.4 B	NA
Cadmium	5	0.4 U	NA	0.4 U	NA	0.4 U	NA
Calcium	NE	93900	NA	98300	NA	96400	NA
Chloride (mg/l)	NE	65	NA	35	NA	36	NA
Chromium	50	2 U	NA	3.2 B	NA	2 U	NA
Cobalt	NE	0.77 B	NA	2 B	NA	2.4 B	NA
Copper	200	5 U	NA	10.2 B	NA	5 U	NA
Iron (mg/l)	0.3	**1.04**	NA	**2.02 E**	NA	**3.43**	**0.351**
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	288
Lead	25	2.8 B	NA	8.4 B	NA	6.9 B	NA
Magnesium	35000*	4900	NA	8120	NA	10400	NA
Manganese (mg/l)	0.3	0.109	NA	0.276	NA	**0.59**	0.194 E
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	163 E
Nickel	100	1.2 B	NA	4.4 B	NA	4.2 B	NA
Potassium	NE	2740	NA	4550	NA	6120	NA
Selenium	10	4 U	NA	4 U	NA	5.3 B	NA
Silver	50	2 U	NA	2 U	NA	2 U	NA
Sodium	20000	**40800**	NA	18100	NA	**21000**	NA
Thallium	0.5*	3 U	NA	3 U	NA	3 U	NA
Vanadium	NE	0.5 U	NA	3.2 B	NA	17.4 B	NA
Zinc	2000*	4 U	NA	30.2 B	NA	28.8 B	NA
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	390
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	15
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	490	NA	430	NA	530	NA
Cyanide							
Cyanide (mg/l)	0.2	**0.425**	**1.250**	0.153	0.176	**0.355 N**	0.13
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	13.8 B	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	13.6 B	NA	16.0	NA	13.8 BN	NA
Total Cyanide		0.438	1.25	0.155	0.176	0.358	0.13

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)				
		RPMW-08S		RPMW-10S		RPMW-11S
		RPMW-08S 03/08/2000 5-15	RPMW-08S 09/17/2002 5-15	RPMW-10S 03/06/2000 5-15	RPMW-10S 09/24/2002 5-15	RPMW-11S 03/17/2000 5-15
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	**8000 D**	1 U	**15000**	**61000**	5 U
Toluene	5	**56**	1 U	**6200**	**40000**	5 U
Ethylbenzene	5	**830 D**	1 U	**360 J**	**6700**	5 U
Xylene (total)	5	**1800 D**	1 U	**830 J**	**8700**	5 U
Total BTEX		10686	0	22390	116400	0
Other Volatile Organic Compounds (ug/l)						
1,1,2-Trichloroethane	1	5 U	NA	1000 U	NA	5 U
1,2,4-Trimethylbenzene	5	**290 D**	NA	1000 U	NA	5 U
1,2-Dichlorobenzene	3	5 U	NA	1000 U	NA	5 U
1,3,5-Trimethylbenzene	5	**230 E**	NA	1000 U	NA	5 U
2-Butanone	50*	5 U	NA	1000 U	NA	5 U
Acetone	50*	5 U	NA	1000 U	NA	5 U
Chloroform	7	5 U	NA	1000 U	NA	5 U
Isopropylbenzene	5	**52**	NA	1000 U	NA	1 J
Methyl tert-butyl ether	NE	5 U	NA	1000 U	NA	5 U
Methylene chloride	5	5 U	NA	1000 U	NA	5 U
Styrene	5	5 U	NA	**240 J**	NA	5 U
cis-1,2-Dichloroethene	5	5 U	NA	1000 U	NA	5 U
n-Propylbenzene	5	5 U	NA	1000 U	NA	5 U
p-Cymene	NE	38	NA	1000 U	NA	5 U
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	10 U	10 U	50 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	50 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	50 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	50 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	50 U	10 U	10 U
Dibenzo(a,h)anthracene	NE	10 U	10 U	50 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	50 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	2 J	10 U	40 J	50	10 U
Acenaphthene	20*	10 U	10 U	8 J	12	10 U
Acenaphthylene	NE	10 U	10 U	50 U	2 J	10 U
Anthracene	50*	10 U	10 U	50 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	50 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	50 U	2 J	10 U
Fluorene	50*	10 U	10 U	50 U	6 J	10 U
Naphthalene	10*	**11**	10 U	**1000 D**	**1500 D**	3 J
Phenanthrene	50*	10 U	10 U	18 J	18	10 U
Pyrene	50*	10 U	10 U	50 U	2 J	3 J
Total Non-Carcinogenic PAHs		13	0	1066	1592	6
Total PAHs		13	0	1066	1592	6
Other Semivolatile Organic Compounds (ug/l)						
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	10 U	NA	27 J	NA	10 U
2-Methylphenol	1	10 U	NA	**46 J**	NA	10 U
4-Methylphenol	1	10 U	NA	**29 J**	NA	10 U
Bis(2-ethylhexyl)phthalate	5	10 U	NA	50 U	NA	2 J
Carbazole	NE	10 U	NA	50 U	NA	10 U
Dibenzofuran	NE	10 U	10 U	50 U	1 J	10 U
Phenol	1	10 U	NA	**34 J**	NA	10 U

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	Ambient Groundwater Quality Standards (GA)	NYS RPMW-08S RPMW-08S 03/08/2000 5-15	RPMW-08S RPMW-08S 09/17/2002 5-15	RPMW-10S RPMW-10S 03/06/2000 5-15	RPMW-10S RPMW-10S 09/24/2002 5-15	RPMW-11S RPMW-11S 03/17/2000 5-15
Metals (ug/l)						
Aluminum	NE	44.9 B	NA	38.1 B	NA	322
Antimony	3	3 U	NA	3 U	NA	3 U
Arsenic	25	4 U	NA	4 U	NA	4 U
Barium	1000	16.1 B	NA	19 B	NA	30.3 B
Cadmium	5	0.4 U	NA	0.4 U	NA	0.4 U
Calcium	NE	110000	NA	101000	NA	185000
Chloride (mg/l)	NE	47	NA	15	NA	4500
Chromium	50	2 U	NA	3 B	NA	2 U
Cobalt	NE	0.44 B	NA	3.2 B	NA	1.2 B
Copper	200	5 U	NA	5 U	NA	9.9 B
Iron (mg/l)	0.3	**0.63**	NA	**3.22**	**7.83**	**28.5**
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	**2600**	NA
Lead	25	8.7 B	NA	8 B	NA	7.8 B
Magnesium	35000*	7100	NA	5450	NA	**199000**
Manganese (mg/l)	0.3	0.0715	NA	0.155	0.21 E	**0.456**
Manganese (Dissolved)	300	NA	NA	NA	171 E	NA
Nickel	100	6.2 B	NA	7.7 B	NA	6.1 B
Potassium	NE	1960 B	NA	5500	NA	120000
Selenium	10	4 U	NA	4 U	NA	4 U
Silver	50	2 U	NA	2.1 B	NA	2 U
Sodium	20000	**30600**	NA	11300	NA	**1800000**
Thallium	0.5*	3 U	NA	3 U	NA	3 U
Vanadium	NE	0.5 U	NA	4.6 B	NA	2.8 B
Zinc	2000*	5.9 B	NA	51	NA	4 U
Natural Attenuation Parameters						
Alkalinity (mg/l)	NE	NA	NA	NA	270	NA
Sulfate (mg/l)	250	NA	NA	NA	24	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	550	NA	410	NA	7300
Cyanide						
Cyanide (mg/l)	0.2	**0.397**	0.118	**0.233**	0.17	**0.537**
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	7.9 B
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	9.3 B	NA	7.9 B
Total Cyanide		4.397	0.118	0.242	0.17	0.545

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPMW-12S		RPMW-13S		RPMW-14S	
		RPMW-12S 03/09/2000 5-15	RPMW-12S 09/19/2002 5-15	RPMW-13S 03/13/2000 5-15	RPMW-13S 09/18/2002 5-15	RPMW-14S 03/09/2000 5-15	RPMW-14S 09/18/2002 5-15
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	**11**	5 U	**18 J**	**13**	**1600 D**	**410**
Toluene	5	**610 D**	**100**	**160**	**41**	**490 D**	**26**
Ethylbenzene	5	**160 DJ**	**100**	**190**	**1200 D**	**2300 D**	**960**
Xylene (total)	5	**1300 D**	**650**	**1800 D**	**3200 D**	**2400 D**	**440**
Total BTEX		2081	850	2168	4454	6790	1836
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	5 U	NA	25 U	NA	5 U	NA
1,2,4-Trimethylbenzene	5	**180 D**	NA	550 U	NA	**300 D**	NA
1,2-Dichlorobenzene	3	5 U	NA	25 U	NA	5 U	NA
1,3,5-Trimethylbenzene	5	**77**	NA	**200**	NA	**170**	NA
2-Butanone	50*	4 J	NA	25 U	NA	5 U	NA
Acetone	50*	15	NA	25 U	NA	5 U	NA
Chloroform	7	5 U	NA	25 U	NA	5 U	NA
Isopropylbenzene	5	**14**	NA	25 U	NA	**90**	NA
Methyl tert-butyl ether	NE	5 U	NA	25 U	NA	5 U	NA
Methylene chloride	5	5 U	NA	25 U	NA	5 U	NA
Styrene	5	**320 D**	NA	25 U	NA	**40**	NA
cis-1,2-Dichloroethene	5	5 U	NA	25 U	NA	5 U	NA
n-Propylbenzene	5	**9**	NA	25 U	NA	**14**	NA
p-Cymene	NE	3 J	NA	13 J	NA	6	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	300 U	150 U	400 U	300 U	**1 J**	10 U
Benzo(a)pyrene	ND	300 U	150 U	400 U	300 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	300 U	150 U	400 U	300 U	**1 J**	10 U
Benzo(k)fluoranthene	0.002*	300 U	150 U	400 U	300 U	10 U	10 U
Chrysene	0.002*	300 U	150 U	400 U	300 U	**1 J**	10 U
Dibenzo(a,h)anthracene	NE	300 U	150 U	400 U	300 U	10 U	NA
Indeno(1,2,3-cd)pyrene	0.002*	300 U	150 U	400 U	300 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	3	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	720	420	670	360	71	10 U
Acenaphthene	20*	300 U	**24 J**	**190 J**	**96 J**	6 J	3 J
Acenaphthylene	NE	290 J	150	400 U	300 U	2 J	10 U
Anthracene	50*	33 J	150 U	400 U	300 U	2 J	10 U
Benzo(ghi)perylene	NE	300 U	150 U	400 U	300 U	10 U	10 U
Fluoranthene	50*	300 U	150 U	400 U	300 U	2 J	10 U
Fluorene	50*	**85 J**	**53 J**	**110 J**	**51 J**	8 J	2 J
Naphthalene	10*	**4000**	**1800**	**4500**	**3100**	**980 D**	**140**
Phenanthrene	50*	**110 J**	**58 J**	**180 J**	**65 J**	8 J	3 J
Pyrene	50*	30 J	150 U	**62 J**	300 U	4 J	10 U
Total Non-Carcinogenic PAHs		5268	2505	5712	3672	1083	148
Total PAHs		5268	2505	5712	3672	1083	148
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	50*	300 U	NA	400 U	NA	10 U	NA
2-Methylphenol	1	300 U	NA	400 U	NA	**4 J**	NA
4-Methylphenol	1	300 U	NA	400 U	NA	**4 J**	NA
Bis(2-ethylhexyl)phthalate	5	300 U	NA	400 U	NA	10 U	NA
Carbazole	NE	300 U	NA	400 U	NA	10 U	NA
Dibenzofuran	NE	300 U	150 U	400 U	300 U	2 J	10 U
Phenol	1	300 U	NA	400 U	NA	**7 J**	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)					
		RPMW-12S		RPMW-13S		RPMW-14S	
		RPMW-12S 03/09/2000 5-15	RPMW-12S 09/19/2002 5-15	RPMW-13S 03/13/2000 5-15	RPMW-13S 09/18/2002 5-15	RPMW-14S 03/09/2000 5-15	RPMW-14S 09/18/2002 5-15
Metals (ug/l)							
Aluminum	NE	171 B	NA	48.3 B	NA	29.9 B	NA
Antimony	3	3 U	NA	3 U	NA	3 U	NA
Arsenic	25	13.9	NA	4 U	NA	4 U	NA
Barium	1000	103 B	NA	73.5 B	NA	85.1 B	NA
Cadmium	5	0.73 B	NA	0.4 U	NA	0.4 U	NA
Calcium	NE	91200	NA	68700	NA	77300	NA
Chloride (mg/l)	NE	170	NA	110	NA	140	NA
Chromium	50	3.2 B	NA	2 U	NA	2 U	NA
Cobalt	NE	0.91 B	NA	0.67 B	NA	0.3 U	NA
Copper	200	5 U	NA	5 U	NA	5 U	NA
Iron (mg/l)	0.3	**34.9**	NA	**5.02**	NA	**14.7**	NA
Ferrous Iron (mg/l)	NE	NA	NA	NA	NA	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	7.5 B	NA	2.3 U	NA	6.3 B	NA
Magnesium	35000*	8190	NA	11300	NA	9610	NA
Manganese (mg/l)	0.3	0.266	NA	0.288	NA	**0.306**	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Nickel	100	4.5 B	NA	2.1 B	NA	2.2 B	NA
Potassium	NE	8660	NA	10200	NA	3840	NA
Selenium	10	4 U	NA	8.2 B	NA	4 U	NA
Silver	50	2 U	NA	2 U	NA	2 U	NA
Sodium	20000	**104000**	NA	**49100**	NA	**71600**	NA
Thallium	0.5*	3 U	NA	3 U	NA	3 U	NA
Vanadium	NE	8.2 B	NA	17.6 B	NA	3.3 B	NA
Zinc	2000*	8.9 B	NA	10.9 B	NA	4 U	NA
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	NA	NA	NA	NA	NA	NA
Sulfate (mg/l)	250	NA	NA	NA	NA	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	730	NA	480	NA	590	NA
Cyanide							
Cyanide (mg/l)	0.2	**0.562**	**0.770**	0.156 N	0.154	0.112	0.161
Cyanide (Dissolved) (ug/l)	NE	NA	NA	20.1	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	41.4	NA	20.1 N	NA	4 U	NA
Total Cyanide		0.604	0.77	0.196	0.154	0.112	0.161

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)			
		RPMW-16S	RPMW-16S	RPMW-17S	
		RPMW-16S 03/10/2000 5-15	RPMW-16S 11/07/2002 4-14	RPMW-17S 03/14/2000 5-15	RPMW-17S 09/19/2002 5-15
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	5 U	5 U	**1500 D**	**1500**
Toluene	5	5 U	5 U	**1700 D**	**160**
Ethylbenzene	5	5 U	5 U	**3800 D**	**4700**
Xylene (total)	5	5 U	5 U	**1200 D**	**540**
Total BTEX		0	0	8200	6900
Other Volatile Organic Compounds (ug/l)					
1,1,2-Trichloroethane	1	5 U	5 U	5 U	NA
1,2,4-Trimethylbenzene	5	5 U	5 U	**140**	NA
1,2-Dichlorobenzene	3	5 U	5 U	1 J	NA
1,3,5-Trimethylbenzene	5	5 U	5 U	**35**	NA
2-Butanone	50*	5 U	5 R	5 U	NA
Acetone	50*	5 U	5 R	5 U	NA
Chloroform	7	5 U	5 U	5 U	NA
Isopropylbenzene	5	5 U	5 U	**39**	NA
Methyl tert-butyl ether	NE	5 U	2 J	5 U	NA
Methylene chloride	5	5 U	5 U	5 U	NA
Styrene	5	5 U	5 U	5 U	NA
cis-1,2-Dichloroethene	5	5 U	5 U	5 U	NA
n-Propylbenzene	5	5 U	5 U	5 U	NA
p-Cymene	NE	5 U	5 U	3 J	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	40 U	30 U
Benzo(a)pyrene	ND	10 U	10 U	40 U	30 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	40 U	30 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	40 U	30 U
Chrysene	0.002*	10 U	10 U	40 U	30 U
Dibenzo(a,h)anthracene	NE	10 U	10 U	40 U	30 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	40 U	30 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	11 J	30 U
Acenaphthene	20*	10 U	10 U	40 U	30 U
Acenaphthylene	NE	10 U	10 U	40 U	30 U
Anthracene	50*	10 U	10 U	40 U	30 U
Benzo(ghi)perylene	NE	10 U	10 U	40 U	30 U
Fluoranthene	50*	10 U	10 U	40 U	30 U
Fluorene	50*	10 U	10 U	40 U	30 U
Naphthalene	10*	2 J	10 U	**400 D**	**270**
Phenanthrene	50*	10 U	10 U	40 U	30 U
Pyrene	50*	10 U	10 U	40 U	30 U
Total Non-Carcinogenic PAHs		2	0	411	270
Total PAHs		2	0	411	270
Other Semivolatile Organic Compounds (ug/l)					
1-Methyl naphthalene	NE	NA	NA	NA	NA
2,4-Dimethylphenol	50*	10 U	NA	40 U	NA
2-Methylphenol	1	10 U	NA	40 U	NA
4-Methylphenol	1	10 U	NA	40 U	NA
Bis(2-ethylhexyl)phthalate	5	10 U	NA	40 U	NA
Carbazole	NE	10 U	NA	40 U	NA
Dibenzofuran	NE	10 U	10 U	40 U	30 U
Phenol	1	10 U	NA	40 U	NA

Table 4-37 (continued)
Shallow Groundwater Analytical Results (0-17 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Depth (ft)			
		RPMW-16S	RPMW-16S	RPMW-17S	
		RPMW-16S 03/10/2000 5-15	RPMW-16S 11/07/2002 4-14	RPMW-17S 03/14/2000 5-15	RPMW-17S 09/19/2002 5-15
Metals (ug/l)					
Aluminum	NE	525 E*	NA	11.2 B	NA
Antimony	3	3 U	NA	3 U	NA
Arsenic	25	4 U	NA	4 U	NA
Barium	1000	49.8 B	NA	10.4 B	NA
Cadmium	5	0.4 U	NA	0.4 U	NA
Calcium	NE	52500	76400	77100	NA
Chloride (mg/l)	NE	100	NA	1240	NA
Chromium	50	2 U	NA	2 U	NA
Cobalt	NE	1.1 B	NA	0.7 B	NA
Copper	200	21.1 B	NA	5 U	NA
Iron (mg/l)	0.3	**0.65 E**	**0.354**	0.0334 B	NA
Ferrous Iron (mg/l)	NE	NA	100 U	NA	NA
Ferrous Iron (Dissolved) (mg/l)	NE	NA	100 U	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	10.1	NA	2.3 U	NA
Magnesium	35000*	10600	NA	72400	NA
Manganese (mg/l)	0.3	0.103	0.0502	0.163	NA
Manganese (Dissolved)	300	NA	50.5	NA	NA
Nickel	100	3.4 B	NA	1 B	NA
Potassium	NE	8810	10200	30200	NA
Selenium	10	4 U	NA	6.1 B	NA
Silver	50	2 U	NA	2 U	NA
Sodium	20000	**54400**	**70100**	**506000**	NA
Thallium	0.5*	3 U	NA	3 U	NA
Vanadium	NE	2.9 B	NA	112	NA
Zinc	2000*	24.8 B	NA	4 U	NA
Natural Attenuation Parameters					
Alkalinity (mg/l)	NE	NA	190	NA	NA
Sulfate (mg/l)	250	NA	100	NA	NA
Hydrogen ion (pH)	NE	NA	NA	NA	NA
Residue, filterable (mg/l)	NE	440	NA	2400	NA
Cyanide					
Cyanide (mg/l)	0.2	0.0079 B	0.005 U	0.0307	0.0194 B
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, amenable to chlorination (mg/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4 U	NA
Total Cyanide		0.0079	0	0.0307	0.0194

Notes:

* guidance value
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
Shading/bolding indicates an exceedance of established New York State ambient groundwater quality standards (GA)
TCLP - Toxicity Characteristic Leaching Procedure
mg/L - milligrams/liter
ug/L - micrograms/liter or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons

Table 4-38
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-01	RPGP-02	RPGP-03	RPGP-04
		RPGP-01 (26-30)	RPGP-02 (26-30)	RPGP-03 (26-30)	RPGP-04 (26-30)
		02/08/2000	02/22/2000	02/15/2000	02/03/2000
		26-30	26-30	26-30	26-30
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	**280**	1 U
Toluene	5	1 U	1 U	10 U	1 U
Ethylbenzene	5	1 U	1 U	**780**	**9**
Xylene (total)	5	1 U	1 U	**58**	4
Total BTEX		0	0	1118	13
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	100 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	100 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	100 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	100 U	10 U
Chrysene	0.002*	10 U	10 U	100 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA	NA
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	87 J	10 U
Acenaphthene	20*	10 U	10 U	**220**	10 U
Acenaphthylene	NE	10 U	10 U	100 U	10 U
Anthracene	50*	10 U	10 U	100 U	10 U
Benzo(ghi)perylene	NE	NA	NA	NA	NA
Fluoranthene	50*	10 U	10 U	100 U	10 U
Fluorene	50*	10 U	10 U	**51 J**	10 U
Naphthalene	10*	10 U	10 U	**1200**	10 U
Phenanthrene	50*	1 J	10 U	48 J	10 U
Pyrene	50*	10 U	10 U	100 U	10 U
Total Non-Carcinogenic PAHs		1	0	1606	0
Total PAHs		1	0	1606	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	100 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-01	RPGP-02	RPGP-03	RPGP-04
		RPGP-01 (26-30) 02/08/2000 26-30	RPGP-02 (26-30) 02/22/2000 26-30	RPGP-03 (26-30) 02/15/2000 26-30	RPGP-04 (26-30) 02/03/2000 26-30
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPGP-05	RPGP-06	RPGP-07	RPGP-08	RPGP-09
		RPGP-05 (26-30)	RPGP-06 (26-30)	RPGP-07 (26-30)	RPGP-08 (26-30)	RPGP-09 (26-30)
		02/02/2000	02/01/2000	02/01/2000	01/28/2000	01/24/2000
		26-30	26-30	26-30	26-30	26-30
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	**8900**	10 U	1 U	1 U	1 U
Toluene	5	100 U	**44**	1 U	1 U	1 U
Ethylbenzene	5	**960**	**170**	1 U	1 U	1 U
Xylene (total)	5	**320**	**410**	1 U	1 U	1 U
Total BTEX		10180	624	0	0	0
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	NA	**22**	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	**10**	NA	NA	NA
Acetone	50*	NA	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA	NA
Isopropylbenzene	5	NA	3 J	NA	NA	NA
Methyl tert-butyl ether	2	NA	**34**	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA
n-Propylbenzene	5	NA	3 J	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	40 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	40 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	40 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	40 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	40 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA	NA	NA
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	39 J	13	10 U	10 U	10 U
Acenaphthene	20*	**28 J**	10 U	10 U	10 U	10 U
Acenaphthylene	NE	21 J	10 U	10 U	10 U	10 U
Anthracene	50*	6 J	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	NA	NA	NA	NA	NA
Fluoranthene	50*	40 U	2 J	10 U	10 U	10 U
Fluorene	50*	15 J	2 J	10 U	10 U	10 U
Naphthalene	10*	**380**	**58**	10 U	10 U	10 U
Phenanthrene	50*	22 J	6 J	10 U	10 U	10 U
Pyrene	50*	40 U	2 J	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		511	83	0	0	0
Total PAHs		511	83	0	0	0
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	NA	10 U	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	**9 J**	NA	NA	NA
Carbazole	NE	NA	10 U	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA	NA
Dibenzofuran	NE	40 U	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA	NA
Phenol	1	NA	10 U	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPGP-05	RPGP-06	RPGP-07	RPGP-08	RPGP-09
		RPGP-05 (26-30) 02/02/2000 26-30	RPGP-06 (26-30) 02/01/2000 26-30	RPGP-07 (26-30) 02/01/2000 26-30	RPGP-08 (26-30) 01/28/2000 26-30	RPGP-09 (26-30) 01/24/2000 26-30
Metals (ug/l)						
Aluminum	NE	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA	NA
Cyanide (mg/l)						
Cyanide	0.2	NA	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-10	RPGP-11	RPGP-12	RPGP-13
		RPGP-10 (26-30)	RPGP-11 (26-30)	RPGP-12 (26-30)	RPGP-13 (26-30)
		02/24/2000	03/03/2000	02/14/2000	02/04/2000
		26-30	26-30	26-30	26-30
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U
Xylene (total)	5	1 U	1 U	1 U	1 U
Total BTEX		0	0	0	0
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA	NA
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	NA	NA	NA	NA
Fluoranthene	50*	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0	0
Total PAHs		0	0	0	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-10	RPGP-11	RPGP-12	RPGP-13
		RPGP-10 (26-30) 02/24/2000 26-30	RPGP-11 (26-30) 03/03/2000 26-30	RPGP-12 (26-30) 02/14/2000 26-30	RPGP-13 (26-30) 02/04/2000 26-30
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-14	RPGP-15	RPGP-16	RPGP-20
		RPGP-14 (26-30) 01/27/2000 26-30	RPGP-15(26-30) 01/26/2000 26-30	RPGP-16 (31-35) 01/11/2000 31-35	RPGP-20(40-44) 11/16/2001 40-44
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	**56**
Xylene (total)	5	1 U	1 U	1 U	2
Total BTEX		0	0	0	58
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA	NA
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U	**32**
Acenaphthylene	NE	10 U	10 U	10 U	8 J
Anthracene	50*	10 U	10 U	10 U	2 J
Benzo(ghi)perylene	NE	NA	NA	NA	NA
Fluoranthene	50*	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	3 J
Naphthalene	10*	10 U	10 U	10 U	2 J
Phenanthrene	50*	10 U	10 U	10 U	8 J
Pyrene	50*	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0	55
Total PAHs		0	0	0	55
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	1 J
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-14	RPGP-15	RPGP-16	RPGP-20
		RPGP-14 (26-30) 01/27/2000 26-30	RPGP-15(26-30) 01/26/2000 26-30	RPGP-16 (31-35) 01/11/2000 31-35	RPGP-20(40-44) 11/16/2001 40-44
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft) RPGP-20 RPGP-20(22-26) 11/16/2001 22-26	RPGP-21 RPGP-21(22-26) 11/19/2001 22-26	RPGP-22 RPGP-22(22-26) 11/20/2001 22-26	RPGP-23 RPGP-23(40-44) 11/26/2001 40-44
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	**68**	**2**	**240**	1 U
Toluene	5	2 U	1 U	5 U	1 U
Ethylbenzene	5	**44**	2	**140**	1 U
Xylene (total)	5	4	3	**10**	1
Total BTEX		116	7	390	1
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	**15 J**	30 U	10 U
Benzo(a)pyrene	ND	10 U	12 J	30 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	**10 J**	30 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	**4 J**	30 U	10 U
Chrysene	0.002*	10 U	**12 J**	30 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA	NA
Total Carcinogenic PAHs		0	53	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	96	26 J	2 J
Acenaphthene	20*	**120**	**73**	**55**	2 J
Acenaphthylene	NE	11	24 J	30 U	2 J
Anthracene	50*	4 J	24 J	30 U	1 J
Benzo(ghi)perylene	NE	NA	NA	NA	NA
Fluoranthene	50*	1 J	43	30 U	10 U
Fluorene	50*	3 J	**58**	5 J	10 U
Naphthalene	10*	2 J	**310**	**350**	9 J
Phenanthrene	50*	5 J	40	8 J	0.9 J
Pyrene	50*	10 U	**52**	30 U	1 J
Total Non-Carcinogenic PAHs		146	720	444	17.9
Total PAHs		146	773	444	17.9
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	2 J	30	30 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-20	RPGP-21	RPGP-22	RPGP-23
		RPGP-20(22-26)	RPGP-21(22-26)	RPGP-22(22-26)	RPGP-23(40-44)
		11/16/2001	11/19/2001	11/20/2001	11/26/2001
		22-26	22-26	22-26	40-44
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-23	RPGP-24	RPGP-24	RPGP-25
		RPGP-23(22-26)	RPGP-24(40-44)	RPGP-24(22-26)	RPGP25-GW20-24
		11/26/2001	11/26/2001	11/26/2001	07/17/2002
		22-26	40-44	22-26	20-24
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	**1400**	1 U	1 U	1 U
Toluene	5	50 U	1 U	1 U	1 U
Ethylbenzene	5	**1600**	1 U	1 U	1 U
Xylene (total)	5	**84**	1 U	1 U	1 U
Total BTEX		3084	0	0	0
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA	NA
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	380 DJ	10 U	10 U	10 U
Acenaphthene	20*	**460 DJ**	10 U	10 U	10 U
Acenaphthylene	NE	3 J	10 U	10 U	10 U
Anthracene	50*	4 J	10 U	10 U	10 U
Benzo(ghi)perylene	NE	NA	NA	NA	NA
Fluoranthene	50*	2 J	10 U	10 U	10 U
Fluorene	50*	22	10 U	10 U	10 U
Naphthalene	10*	**6800 D**	10 U	10 U	10 U
Phenanthrene	50*	17	10 U	10 U	10 U
Pyrene	50*	4 J	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		7692	0	0	0
Total PAHs		7692	0	0	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	4 J	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-23	RPGP-24	RPGP-24	RPGP-25
		RPGP-23(22-26)	RPGP-24(40-44)	RPGP-24(22-26)	RPGP25-GW20-24
		11/26/2001	11/26/2001	11/26/2001	07/17/2002
		22-26	40-44	22-26	20-24
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)		
		RPGP-25	RPGP-26	RPGP-26
		RPGP25-GW36-40	RPGP26-GW20-24	RPGP26-GW36-40
		07/17/2002	07/19/2002	07/19/2002
		36-40	20-24	36-40
Volatile Organic Compounds (VOCs)				
BTEX (ug/l)				
Benzene	1	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U
Xylene (total)	5	1 U	1 U	1 U
Total BTEX		0	0	0
Other Volatile Organic Compounds (ug/l)				
1,2,4-Trimethylbenzene	5	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA
Acetone	50*	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA
Chloroform	7	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA
Styrene	5	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA
p-Cymene	NE	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHS (ug/l)				
Benzo(a)anthracene	0.002*	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA
Total Carcinogenic PAHs		0	0	0
Non-Carcinogenic PAHS (ug/l)				
2-Methylnaphthalene	NE	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U
Benzo(ghi)perylene	NE	NA	NA	NA
Fluoranthene	50*	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0
Total PAHs		0	0	0
Other Semivolatile Organic Compounds (ug/l)				
2,4-Dimethylphenol	50*	NA	NA	NA
2-Methylphenol	1	NA	NA	NA
4-Methylphenol	1	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA
Carbazole	NE	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA
Isophorone	50*	NA	NA	NA
Phenol	1	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)		
		RPGP-25	RPGP-26	RPGP-26
		RPGP25-GW36-40	RPGP26-GW20-24	RPGP26-GW36-40
		07/17/2002	07/19/2002	07/19/2002
		36-40	20-24	36-40
Metals (ug/l)				
Aluminum	NE	NA	NA	NA
Antimony	3	NA	NA	NA
Arsenic	25	NA	NA	NA
Barium	1000	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA
Cadmium	5	NA	NA	NA
Calcium	NE	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA
Chromium	50	NA	NA	NA
Cobalt	NE	NA	NA	NA
Copper	200	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA
Lead	25	NA	NA	NA
Magnesium	35000*	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA
Mercury	0.7	NA	NA	NA
Nickel	100	NA	NA	NA
Potassium	NE	NA	NA	NA
Selenium	10	NA	NA	NA
Silver	50	NA	NA	NA
Sodium	20000	NA	NA	NA
Thallium	0.5*	NA	NA	NA
Vanadium	NE	NA	NA	NA
Zinc	2000*	NA	NA	NA
Natural Attenuation Parameters (mg/l)				
Alkalinity	NE	NA	NA	NA
Sulfate	250	NA	NA	NA
Residue, filterable	NE	NA	NA	NA
Nitrate	10000	NA	NA	NA
Cyanide (mg/l)				
Cyanide	0.2	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA
Total Cyanide		NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-27	RPGP-27	RPGP-28A	RPGP-28A
		RPGP-27GW20-24	RPGP-GW36-40	RPGP28A-GW24-28	RPGP28A-GW36-40
		07/22/2002	07/22/2002	07/24/2002	07/24/2002
		20-24	36-40	24-28	36-40
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	**580**	**2**	1 U	1 U
Toluene	5	10 U	1 U	1 U	1 U
Ethylbenzene	5	**13**	1 U	1 U	1 U
Xylene (total)	5	**11**	1 U	1 U	1 U
Total BTEX		604	2	0	0
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	NA	NA	NA	NA
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U
Acenaphthene	20*	3 J	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	NA	NA	NA	NA
Fluoranthene	50*	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U
Naphthalene	10*	**63**	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		66	0	0	0
Total PAHs		66	0	0	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-27 RPGP-27GW20-24 07/22/2002 20-24	RPGP-27 RPGP-27GW36-40 07/22/2002 36-40	RPGP-28A RPGP28A-GW24-28 07/24/2002 24-28	RPGP-28A RPGP28A-GW36-40 07/24/2002 36-40
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	0.0407 J	0.0368 J
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	0.0407	0.0368

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft) RPMW-01I RPMW-01I 03/15/2000 35-45	RPMW-01I 09/20/2002 35-45
Volatile Organic Compounds (VOCs)			
BTEX (ug/l)			
Benzene	1	5 U	1 U
Toluene	5	5 U	1 U
Ethylbenzene	5	5 U	1 U
Xylene (total)	5	5 U	1 U
Total BTEX		0	0
Other Volatile Organic Compounds (ug/l)			
1,2,4-Trimethylbenzene	5	5 U	NA
1,3,5-Trimethylbenzene	5	5 U	NA
Acetone	50*	5 U	NA
Bromodichloromethane	50*	5 U	NA
Carbon disulfide	NE	5 U	NA
Chloroform	7	5 U	NA
Isopropylbenzene	5	5 U	NA
Methyl tert-butyl ether	2	5 U	NA
Styrene	5	5 U	NA
n-Propylbenzene	5	5 U	NA
sec-Butylbenzene	5	5 U	NA
p-Cymene	NE	5 U	NA
Semivolatile Organic Compounds (SVOCs)			
Carcinogenic PAHS (ug/l)			
Benzo(a)anthracene	0.002*	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U
Chrysene	0.002*	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U
Total Carcinogenic PAHs		0	0
Non-Carcinogenic PAHS (ug/l)			
2-Methylnaphthalene	NE	10 U	10 U
Acenaphthene	20*	13	14
Acenaphthylene	NE	6 J	7 J
Anthracene	50*	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U
Fluoranthene	50*	10 U	10 U
Fluorene	50*	10 U	10 U
Naphthalene	10*	5 U	10 U
Phenanthrene	50*	10 U	10 U
Pyrene	50*	2 J	10 U
Total Non-Carcinogenic PAHs		21	21
Total PAHs		21	21
Other Semivolatile Organic Compounds (ug/l)			
2,4-Dimethylphenol	50*	10 U	NA
2-Methylphenol	1	10 U	NA
4-Methylphenol	1	10 U	NA
Bis(2-ethylhexyl)phthalate	5	**6 J**	NA
Carbazole	NE	10 U	NA
Di-n-butylphthalate	50	10 U	NA
Dibenzofuran	NE	10 U	10 U
Diethylphthalate	50*	10 U	NA
Isophorone	50*	10 U	NA
Phenol	1	10 U	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)	
		RPMW-01I	
		RPMW-01I 03/15/2000 35-45	RPMW-01I 09/20/2002 35-45
Metals (ug/l)			
Aluminum	NE	145 B	NA
Antimony	3	3 U	NA
Arsenic	25	4 U	NA
Barium	1000	16.9 B	NA
Bromide (mg/l)	2000*	NA	NA
Cadmium	5	0.4 U	NA
Calcium	NE	110000	NA
Chloride (mg/l)	NE	970	NA
Chromium	50	2 U	NA
Cobalt	NE	1.8 B	NA
Copper	200	11 B	NA
Iron (mg/l)	0.3	**0.666**	NA
Iron (Dissolved)	300	NA	NA
Lead	25	14.1	NA
Magnesium	35000*	**50500**	NA
Manganese (mg/l)	0.3	0.0497 B	NA
Manganese (Dissolved)	300	NA	NA
Mercury	0.7	0.14 U	NA
Nickel	100	3.1 B	NA
Potassium	NE	24400	NA
Selenium	10	4 U	NA
Silver	50	2 U	NA
Sodium	20000	**479000**	NA
Thallium	0.5*	**3.4 B**	NA
Vanadium	NE	120	NA
Zinc	2000*	25.1 B	NA
Natural Attenuation Parameters (mg/l)			
Alkalinity	NE	NA	NA
Sulfate	250	NA	NA
Residue, filterable	NE	2000	NA
Nitrate	10000	NA	NA
Cyanide (mg/l)			
Cyanide	0.2	**0.688**	0.0080 B
Cyanide (Dissolved) (ug/l)	NE	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA
Total Cyanide		0.688	0.008

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-02I		RPMW-03I	
		RPMW-02I 03/15/2000 35-45	RPMW-02I 09/23/2002 35-45	RPMW-03I 03/15/2000 35-45	RPMW-03I 09/23/2002 35-45
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	**1200**	**360**	**11**	**5**
Toluene	5	**230 J**	**160**	5 U	1 U
Ethylbenzene	5	**3100**	**3900**	5	2
Xylene (total)	5	**2400**	**3400**	5 U	1 U
Total BTEX		6930	7820	16	7
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	**250**	NA	5 U	NA
1,3,5-Trimethylbenzene	5	**110 J**	NA	5 U	NA
Acetone	50*	250 U	NA	5 U	NA
Bromodichloromethane	50*	250 U	NA	5 U	NA
Carbon disulfide	NE	250 U	NA	5 U	NA
Chloroform	7	250 U	NA	5 U	NA
Isopropylbenzene	5	250 U	NA	1 J	NA
Methyl tert-butyl ether	2	250 U	NA	5 U	NA
Styrene	5	250 U	NA	5 U	NA
n-Propylbenzene	5	250 U	NA	5 U	NA
sec-Butylbenzene	5	250 U	NA	5 U	NA
p-Cymene	NE	250 U	NA	5 U	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	1000 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	1000 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	1000 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	1000 U	10 U	10 U
Chrysene	0.002*	10 U	1000 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	1000 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	420 DJ	890 J	8 J	10 U
Acenaphthene	20*	**200 DJ**	**400 J**	8 J	10 U
Acenaphthylene	NE	25	110 J	7 J	4 J
Anthracene	50*	5 J	1000 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	1000 U	10 U	10 U
Fluoranthene	50*	1 J	1000 U	10 U	10 U
Fluorene	50*	50	1000 U	2 J	10 U
Naphthalene	10*	**8500 D**	**11000 B**	**61**	10 U
Phenanthrene	50*	36	1000 U	6 J	10 U
Pyrene	50*	1 J	1000 U	2 J	10 U
Total Non-Carcinogenic PAHs		9238	12400	94	4
Total PAHs		9238	12400	94	4
Other Semivolatile Organic Compounds (ug/l)			\		
2,4-Dimethylphenol	50*	10 U	NA	10 U	NA
2-Methylphenol	1	10 U	NA	10 U	NA
4-Methylphenol	1	10 U	NA	10 U	NA
Bis(2-ethylhexyl)phthalate	5	10 U	NA	10 U	NA
Carbazole	NE	27	NA	10 U	NA
Di-n-butylphthalate	50	10 U	NA	10 U	NA
Dibenzofuran	NE	6 J	1000 U	10 U	10 U
Diethylphthalate	50*	10 U	NA	10 U	NA
Isophorone	50*	10 U	NA	10 U	NA
Phenol	1	10 U	NA	10 U	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-02I		RPMW-03I	
		RPMW-02I 03/15/2000 35-45	RPMW-02I 09/23/2002 35-45	RPMW-03I 03/15/2000 35-45	RPMW-03I 09/23/2002 35-45
Metals (ug/l)					
Aluminum	NE	10 U	NA	10 U	NA
Antimony	3	3 U	NA	**3.6 B**	NA
Arsenic	25	4 U	NA	6.7 B	NA
Barium	1000	29.2 BE	NA	35.8 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	0.4 U	NA
Calcium	NE	172000	NA	264000	NA
Chloride (mg/l)	NE	4400	NA	12000	NA
Chromium	50	2 U	NA	2 U	NA
Cobalt	NE	0.53 B	NA	1.5 B	NA
Copper	200	5 U	NA	5 U	NA
Iron (mg/l)	0.3	0.0204 BE	0.0631 B	0.0702 B	NA
Iron (Dissolved)	300	NA	252	NA	NA
Lead	25	2.3 U	NA	2.3 U	NA
Magnesium	35000*	**178000 E**	NA	**541000**	NA
Manganese (mg/l)	0.3	0.142 E	0.0101 B	0.0446 B	NA
Manganese (Dissolved)	300	NA	20.6 B	NA	NA
Mercury	0.7	0.15 U	NA	0.14 U	NA
Nickel	100	1 B	NA	0.5 U	NA
Potassium	NE	92800 E	NA	338000	NA
Selenium	10	4 U	NA	6 B	NA
Silver	50	2 U	NA	2 U	NA
Sodium	20000	**1860000**	NA	**6910000**	NA
Thallium	0.5*	**4.7 B**	NA	**10.2**	NA
Vanadium	NE	272 E	NA	**371**	NA
Zinc	2000*	4 U	NA	4 U	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	520	NA	NA
Sulfate	250	NA	**550**	NA	NA
Residue, filterable	NE	7400	12000	19000	NA
Nitrate	10000	NA	0.10 U	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	0.004 U	0.020 UJ	0.0083 B	0.20 J
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4 U	NA
Total Cyanide		0	0.02	0.0083	0.2

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-04I		RPMW-05I	
		RPMW-04I 03/08/2000 35-45	RPMW-04I 09/20/2002 35-45	RPMW-05I 03/10/2000 35-45	RPMW-05I 09/17/2002 35-45
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	5 U	20 U	5 U	**3 D**
Toluene	5	5 U	**49**	4 J	4 D
Ethylbenzene	5	**6**	**360**	**10**	**190 D**
Xylene (total)	5	**10**	**310**	**27**	**180 D**
Total BTEX		16	719	41	377
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	5 U	NA	1 J	NA
1,3,5-Trimethylbenzene	5	3 J	NA	4 J	NA
Acetone	50*	5 U	NA	5 U	NA
Bromodichloromethane	50*	2 J	NA	2 J	NA
Carbon disulfide	NE	5 U	NA	5 U	NA
Chloroform	7	**18**	NA	**17**	NA
Isopropylbenzene	5	5 U	NA	5 U	NA
Methyl tert-butyl ether	2	5 U	NA	5 U	NA
Styrene	5	5 U	NA	5 U	NA
n-Propylbenzene	5	5 U	NA	5 U	NA
sec-Butylbenzene	5	5 U	NA	5 U	NA
p-Cymene	NE	5 U	NA	5 U	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	60 U	10 U	1000 U
Benzo(a)pyrene	ND	10 U	60 U	10 U	1000 U
Benzo(b)fluoranthene	0.002*	10 U	60 U	10 U	1000 U
Benzo(k)fluoranthene	0.002*	10 U	60 U	10 U	1000 U
Chrysene	0.002*	10 U	60 U	10 U	1000 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	60 U	10 U	1000 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	60 U	10 U	920 J
Acenaphthene	20*	1 J	**57 J**	5 J	**270 J**
Acenaphthylene	NE	5 J	180	10 U	1000 U
Anthracene	50*	10 U	60 U	10 U	1000 U
Benzo(ghi)perylene	NE	10 U	60 U	10 U	1000 U
Fluoranthene	50*	10 U	60 U	10 U	1000 U
Fluorene	50*	10 U	18 J	10 U	1000 U
Naphthalene	10*	**15**	**890**	5 U	**9500**
Phenanthrene	50*	10 U	14 J	10 U	1000 U
Pyrene	50*	10 U	60 U	10 U	1000 U
Total Non-Carcinogenic PAHs		21	1159	5	10690
Total PAHs		21	1159	5	10690
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	10 U	NA	10 U	NA
2-Methylphenol	1	10 U	NA	10 U	NA
4-Methylphenol	1	10 U	NA	10 U	NA
Bis(2-ethylhexyl)phthalate	5	1 J	NA	2 J	NA
Carbazole	NE	10 U	NA	10 U	NA
Di-n-butylphthalate	50	10 U	NA	10 U	NA
Dibenzofuran	NE	10 U	60 U	10 U	1000 U
Diethylphthalate	50*	10 U	NA	10 U	NA
Isophorone	50*	10 U	NA	10 U	NA
Phenol	1	10 U	NA	10 U	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-04I		RPMW-05I	
		RPMW-04I 03/08/2000 35-45	RPMW-04I 09/20/2002 35-45	RPMW-05I 03/10/2000 35-45	RPMW-05I 09/17/2002 35-45
Metals (ug/l)					
Aluminum	NE	169 B	NA	669 E*	NA
Antimony	3	3 U	NA	3 U	NA
Arsenic	25	4 U	NA	4 U	NA
Barium	1000	11.4 B	NA	13.1 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	0.4 U	NA
Calcium	NE	17100	NA	20600	NA
Chloride (mg/l)	NE	48	NA	38	NA
Chromium	50	8.5 B	NA	3.7 B	NA
Cobalt	NE	0.3 U	NA	1.3 B	NA
Copper	200	21.6 B	NA	22.7 B	NA
Iron (mg/l)	0.3	**0.967**	NA	**1.58 E**	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	8.1 B	NA	14.8	NA
Magnesium	35000*	3950	NA	3120	NA
Manganese (mg/l)	0.3	0.0208 B	NA	0.0201 B	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	0.14 U	NA	0.14 U	NA
Nickel	100	1.9 B	NA	4.8 B	NA
Potassium	NE	2730	NA	1860	NA
Selenium	10	4 U	NA	4 U	NA
Silver	50	2 U	NA	2 U	NA
Sodium	20000	**22600**	NA	15800	NA
Thallium	0.5*	3 U	NA	3 U	NA
Vanadium	NE	1.2 B	NA	4.7 B	NA
Zinc	2000*	36.9 B	NA	48.5 B	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	160	NA	130	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	0.004 U	0.0055 B	0.004 U	0.015 B
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4 U	NA
Total Cyanide		0	0.0055	0	0.015

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-06I		RPMW-07I		
		RPMW-06I 03/07/2000 35-45	RPMW-06I 09/19/2002 35-45	RPMW-07I 03/13/2000 35-45	RPMW-07I 09/24/2002 35-45	RPMWXX092402-1 09/24/2002 35-45 (Dup)
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	5 U	**880**	**280 D**	**1100**	**1200**
Toluene	5	5 U	25 U	**7**	20 U	25 U
Ethylbenzene	5	5 U	**1500**	**150 D**	**1400**	**1400**
Xylene (total)	5	5 U	**1100**	**100**	**360**	**380**
Total BTEX		0	3480	537	2860	2980
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	5 U	NA	5 U	NA	NA
1,3,5-Trimethylbenzene	5	5 U	NA	**21**	NA	NA
Acetone	50*	5 U	NA	19	NA	NA
Bromodichloromethane	50*	2 J	NA	1 J	NA	NA
Carbon disulfide	NE	5 U	NA	5 U	NA	NA
Chloroform	7	**22**	NA	**16**	NA	NA
Isopropylbenzene	5	5 U	NA	**14**	NA	NA
Methyl tert-butyl ether	2	5 U	NA	5 U	NA	NA
Styrene	5	5 U	NA	5 U	NA	NA
n-Propylbenzene	5	5 U	NA	4 J	NA	NA
sec-Butylbenzene	5	5 U	NA	5 U	NA	NA
p-Cymene	NE	5 U	NA	2 J	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	10 U	300 U	**18**	**1 J**	10 U
Benzo(a)pyrene	ND	10 U	300 U	14	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	300 U	**14**	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	300 U	**4 J**	10 U	10 U
Chrysene	0.002*	10 U	300 U	**18**	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	300 U	**6 J**	10 U	10 U
Total Carcinogenic PAHs		0	0	74	1	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	10 U	530	3 J	510 JD	550 JD
Acenaphthene	20*	10 U	**300**	**110**	**300 JD**	**300 JD**
Acenaphthylene	NE	10 U	57 J	10 U	12	12
Anthracene	50*	10 U	300 U	26	16	16
Benzo(ghi)perylene	NE	10 U	300 U	7 J	10 U	10 U
Fluoranthene	50*	10 U	300 U	40	7 J	8 J
Fluorene	50*	10 U	**58 J**	30	**100**	**100**
Naphthalene	10*	5 U	**4200**	6 J	**5200 D**	**5400 D**
Phenanthrene	50*	10 U	**81 J**	**75**	**130**	**130**
Pyrene	50*	1 J	300 U	**72**	9 J	9 J
Total Non-Carcinogenic PAHs		1	5226	369	6284	6525
Total PAHs		1	5226	443	6285	6525
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	10 U	NA	10 U	NA	NA
2-Methylphenol	1	10 U	NA	10 U	NA	NA
4-Methylphenol	1	10 U	NA	10 U	NA	NA
Bis(2-ethylhexyl)phthalate	5	2 J	NA	2 J	NA	NA
Carbazole	NE	10 U	NA	8 J	NA	NA
Di-n-butylphthalate	50	10 U	NA	10 U	NA	NA
Dibenzofuran	NE	10 U	300 U	10 U	16	16
Diethylphthalate	50*	10 U	NA	10 U	NA	NA
Isophorone	50*	10 U	NA	10 U	NA	NA
Phenol	1	10 U	NA	**4 J**	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-06I		RPMW-07I		
		RPMW-06I 03/07/2000 35-45	RPMW-06I 09/19/2002 35-45	RPMW-07I 03/13/2000 35-45	RPMW-07I 09/24/2002 35-45	RPMWXX092402-1 09/24/2002 35-45 (Dup)
Metals (ug/l)						
Aluminum	NE	197 B	NA	222 B	NA	NA
Antimony	3	3 U	NA	3 U	NA	NA
Arsenic	25	4 U	NA	4 U	NA	NA
Barium	1000	20.2 B	NA	12.1 B	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA
Cadmium	5	0.51 B	NA	0.4 U	NA	NA
Calcium	NE	23000	NA	22700	NA	NA
Chloride (mg/l)	NE	90	NA	96	NA	NA
Chromium	50	**51.3**	NA	**53.1**	NA	NA
Cobalt	NE	0.38 B	NA	1.3 B	NA	NA
Copper	200	28.1 B	NA	24.9 B	NA	NA
Iron (mg/l)	0.3	**0.445**	0.035 U	**1.22**	0.035 U	0.035 U
Iron (Dissolved)	300	NA	NA	NA	82 B	48.1 B
Lead	25	13	NA	10.5	NA	NA
Magnesium	35000*	9920	NA	3460	NA	NA
Manganese (mg/l)	0.3	0.0176 B	0.0204 B	0.0177 B	0.0337 BE	0.0336 BE
Manganese (Dissolved)	300	NA	NA	NA	36.7 BE	41.8 BE
Mercury	0.7	0.14 U	NA	0.14 U	NA	NA
Nickel	100	0.5 U	NA	4.6 B	NA	NA
Potassium	NE	10500	NA	21400	NA	NA
Selenium	10	4 U	NA	4 U	NA	NA
Silver	50	2 U	NA	2 U	NA	NA
Sodium	20000	**76600**	NA	**51100**	NA	NA
Thallium	0.5*	3 U	NA	3 U	NA	NA
Vanadium	NE	17.9 B	NA	8.5 B	NA	NA
Zinc	2000*	48.4 B	NA	32.3 B	NA	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	370	NA	260	280
Sulfate	250	NA	**470**	NA	130	140
Residue, filterable	NE	260	NA	310	NA	NA
Nitrate	10000	NA	0.50 U	NA	0.25 U	NA
Cyanide (mg/l)						
Cyanide	0.2	0.0057 B	0.0091 B	0.0122 BN	0.020 U	0.020 U
Cyanide (Dissolved) (ug/l)	NE	NA	NA	4.5 B	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4.5 BN	NA	NA
Total Cyanide		0.0057	0.0091	0.0131	0	0

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-08I		RPMW-09I	
		RPMW-08I 03/09/2000 35-45	RPMW-08I 09/17/2002 35-45	RPMW-09I 03/14/2000 35-45	RPMW-09I 09/23/2002 35-45
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	**28**	1 U	**280 D**	**200**
Toluene	5	**53**	1 U	**120**	**140**
Ethylbenzene	5	**11**	1 U	**650 D**	**3000**
Xylene (total)	5	**170**	1 U	**690 D**	**3500**
Total BTEX		262	0	1740	6840
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	**45**	NA	**83**	NA
1,3,5-Trimethylbenzene	5	**12**	NA	**30**	NA
Acetone	50*	12	NA	5 U	NA
Bromodichloromethane	50*	5 U	NA	1 J	NA
Carbon disulfide	NE	5 U	NA	5 U	NA
Chloroform	7	5 U	NA	**19**	NA
Isopropylbenzene	5	**7**	NA	**20**	NA
Methyl tert-butyl ether	2	5 U	NA	5 U	NA
Styrene	5	**16**	NA	5 U	NA
n-Propylbenzene	5	**7**	NA	5 U	NA
sec-Butylbenzene	5	5 U	NA	5 U	NA
p-Cymene	NE	5 U	NA	2 J	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	300 U	750 U
Benzo(a)pyrene	ND	10 U	10 U	300 U	750 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	300 U	750 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	300 U	750 U
Chrysene	0.002*	10 U	10 U	300 U	750 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	300 U	750 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	80	10 U	340	850
Acenaphthene	20*	**23**	7 J	**74 J**	**150 J**
Acenaphthylene	NE	50	21	300 U	750 U
Anthracene	50*	4 J	10 U	300 U	750 U
Benzo(ghi)perylene	NE	10 U	10 U	300 U	750 U
Fluoranthene	50*	1 J	10 U	300 U	750 U
Fluorene	50*	9 J	10 U	42 J	750 U
Naphthalene	10*	**570 D**	**110**	**2200**	**7600 B**
Phenanthrene	50*	19	5 J	**64 J**	750 U
Pyrene	50*	2 J	10 U	300 U	750 U
Total Non-Carcinogenic PAHs		758	143	2720	8600
Total PAHs		758	143	2720	8600
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	4 J	NA	300 U	NA
2-Methylphenol	1	**2 J**	NA	300 U	NA
4-Methylphenol	1	**2 J**	NA	300 U	NA
Bis(2-ethylhexyl)phthalate	5	2 J	NA	300 U	NA
Carbazole	NE	1 J	NA	300 U	NA
Di-n-butylphthalate	50	10 U	NA	300 U	NA
Dibenzofuran	NE	4 J	1 J	300 U	750 U
Diethylphthalate	50*	10 U	NA	300 U	NA
Isophorone	50*	10 U	NA	300 U	NA
Phenol	1	10 U	NA	300 U	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-08I		RPMW-09I	
		RPMW-08I 03/09/2000 35-45	RPMW-08I 09/17/2002 35-45	RPMW-09I 03/14/2000 35-45	RPMW-09I 09/23/2002 35-45
Metals (ug/l)					
Aluminum	NE	174 B	NA	300 B	NA
Antimony	3	3 U	NA	3 U	NA
Arsenic	25	13.1	NA	4 U	NA
Barium	1000	24.1 B	NA	11.3 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	1.0 U
Cadmium	5	0.4 U	NA	0.4 U	NA
Calcium	NE	56700	NA	25600	NA
Chloride (mg/l)	NE	88	NA	34	269
Chromium	50	4.3 B	NA	25.9	NA
Cobalt	NE	0.56 B	NA	0.7 B	NA
Copper	200	34.4 B	NA	15.2 B	NA
Iron (mg/l)	0.3	**0.565**	NA	**0.348**	0.109 B
Iron (Dissolved)	300	NA	NA	NA	136 B
Lead	25	17.6	NA	5.7 B	NA
Magnesium	35000*	1760	NA	1080	NA
Manganese (mg/l)	0.3	0.009 B	NA	0.0062 B	0.0355 B
Manganese (Dissolved)	300	NA	NA	NA	36 B
Mercury	0.7	0.14 U	NA	0.14 U	NA
Nickel	100	5.2 B	NA	1.7 B	NA
Potassium	NE	29800	NA	8180	NA
Selenium	10	4 U	NA	5.5 B	NA
Silver	50	2 U	NA	2 U	NA
Sodium	20000	**66300**	NA	16600	NA
Thallium	0.5*	3 U	NA	3 U	NA
Vanadium	NE	5.7 B	NA	13.7 B	NA
Zinc	2000*	12.7 B	NA	14.6 B	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	200
Sulfate	250	NA	NA	NA	7.0 U
Residue, filterable	NE	430	NA	180	770
Nitrate	10000	NA	NA	NA	0.050 U
Cyanide (mg/l)					
Cyanide	0.2	0.18	0.005 U	0.004 U	0.020 UJ
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	15.1	NA	4 U	NA
Total Cyanide		0.1951	0	0	0

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-10I		RPMW-11I	
		RPMW-10I 03/06/2000 35-45	RPMW-10I 09/24/2002 35-45	RPMW-11I 03/17/2000 35-45	RPMW-11I 09/19/2002 35-45
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	5 U	**3**	**300 D**	**40**
Toluene	5	5 U	3	**47**	**31**
Ethylbenzene	5	2 J	1 U	**880 D**	**1800 D**
Xylene (total)	5	3 J	2	**490 D**	**1200 D**
Total BTEX		5	8	1717	3071
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	5 U	NA	**170 D**	NA
1,3,5-Trimethylbenzene	5	5 U	NA	**26**	NA
Acetone	50*	32	NA	5 U	NA
Bromodichloromethane	50*	2 J	NA	5 U	NA
Carbon disulfide	NE	5 U	NA	5 U	NA
Chloroform	7	**19**	NA	5 U	NA
Isopropylbenzene	5	5 U	NA	**85**	NA
Methyl tert-butyl ether	2	5 U	NA	5 U	NA
Styrene	5	5 U	NA	**10**	NA
n-Propylbenzene	5	5 U	NA	**24**	NA
sec-Butylbenzene	5	5 U	NA	5 U	NA
p-Cymene	NE	5 U	NA	5 U	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	200 U	80 U
Benzo(a)pyrene	ND	10 U	10 U	200 U	80 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	200 U	80 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	200 U	80 U
Chrysene	0.002*	10 U	10 U	200 U	80 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	200 U	80 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	4 J	10 U	220	38 J
Acenaphthene	20*	1 J	10 U	**130 J**	**180**
Acenaphthylene	NE	10 U	10 U	200 U	32 J
Anthracene	50*	10 U	10 U	200 U	14 J
Benzo(ghi)perylene	NE	10 U	10 U	200 U	80 U
Fluoranthene	50*	1 J	10 U	200 U	80 U
Fluorene	50*	1 J	10 U	27 J	27 J
Naphthalene	10*	**18**	10 U	**5000 D**	**800**
Phenanthrene	50*	4 J	10 U	30 J	**60 J**
Pyrene	50*	1 J	10 U	200 U	80 U
Total Non-Carcinogenic PAHs		30	0	5407	1151
Total PAHs		30	0	5407	1151
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	10 U	NA	200 U	NA
2-Methylphenol	1	10 U	NA	200 U	NA
4-Methylphenol	1	10 U	NA	200 U	NA
Bis(2-ethylhexyl)phthalate	5	2 J	NA	200 U	NA
Carbazole	NE	10 U	NA	200 U	NA
Di-n-butylphthalate	50	10 U	NA	200 U	NA
Dibenzofuran	NE	10 U	10 U	200 U	80 U
Diethylphthalate	50*	10 U	NA	200 U	NA
Isophorone	50*	10 U	NA	200 U	NA
Phenol	1	10 U	NA	200 U	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-10I		RPMW-11I	
		RPMW-10I 03/06/2000 35-45	RPMW-10I 09/24/2002 35-45	RPMW-11I 03/17/2000 35-45	RPMW-11I 09/19/2002 35-45
Metals (ug/l)					
Aluminum	NE	281 B	NA	26.7 B	NA
Antimony	3	3 U	NA	3 U	NA
Arsenic	25	4 U	NA	4 U	NA
Barium	1000	25.3 B	NA	32.7 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	0.4 U	NA
Calcium	NE	40400	NA	145000	NA
Chloride (mg/l)	NE	440	NA	8	NA
Chromium	50	48.9	NA	2 U	NA
Cobalt	NE	0.44 B	NA	0.3 U	NA
Copper	200	24.7 B	NA	9.2 B	NA
Iron (mg/l)	0.3	**0.856**	**0.967**	0.0861 B	NA
Iron (Dissolved)	300	NA	37.5 B	NA	NA
Lead	25	19.5	NA	2.3 U	NA
Magnesium	35000*	25900	NA	**221000**	NA
Manganese (mg/l)	0.3	0.0173 B	0.102 E	0.0163 B	NA
Manganese (Dissolved)	300	NA	105 E	NA	NA
Mercury	0.7	0.14 U	NA	0.13 U	NA
Nickel	100	2 B	NA	6.1 B	NA
Potassium	NE	18100	NA	126000	NA
Selenium	10	4 U	NA	4 U	NA
Silver	50	2 U	NA	2.4 B	NA
Sodium	20000	**223000**	NA	**2010000**	NA
Thallium	0.5*	3 U	NA	3 U	NA
Vanadium	NE	2.9 B	NA	0.5 U	NA
Zinc	2000*	91	NA	4 U	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	180	NA	NA
Sulfate	250	NA	**1400**	NA	NA
Residue, filterable	NE	910	NA	8200	NA
Nitrate	10000	NA	0.050 U	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	0.0082 B	0.020 U	0.0062 B	0.0373
Cyanide (Dissolved) (ug/l)	NE	NA	NA	4.6 B	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4.6 B	NA
Total Cyanide		0.0082	0	0.015	0.0373

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-12I		RPMW-13I	
		RPMW-12I 03/09/2000 35-45	RPMW-12I 09/19/2002 35-45	RPMW-13I 03/13/2000 35-45	RPMW-13I 09/18/2002 35-45
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	5 U	1 U	1 J	1 U
Toluene	5	2 J	1 U	**7**	1 U
Ethylbenzene	5	4 J	1 U	**65**	4
Xylene (total)	5	**8**	1 U	**43**	5
Total BTEX		14	0	116	9
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	5 U	NA	1 J	NA
1,3,5-Trimethylbenzene	5	**6**	NA	**10**	NA
Acetone	50*	10	NA	5 U	NA
Bromodichloromethane	50*	2 J	NA	2 J	NA
Carbon disulfide	NE	5 U	NA	5 U	NA
Chloroform	7	**16**	NA	**21**	NA
Isopropylbenzene	5	5 U	NA	4 J	NA
Methyl tert-butyl ether	2	5 U	NA	5 U	NA
Styrene	5	3 J	NA	5 U	NA
n-Propylbenzene	5	5 U	NA	5 U	NA
sec-Butylbenzene	5	3 J	NA	5 U	NA
p-Cymene	NE	5 U	NA	1 J	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	**2 J**	10 U	**4 J**	20 U
Benzo(a)pyrene	ND	**1 J**	10 U	10 U	20 U
Benzo(b)fluoranthene	0.002*	**1 J**	10 U	10 U	20 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	20 U
Chrysene	0.002*	**2 J**	10 U	**3 J**	20 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	20 U
Total Carcinogenic PAHs		6	0	7	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	2 J	2 J
Acenaphthene	20*	2 J	10 U	**42**	**88**
Acenaphthylene	NE	8 J	10 U	2 J	3 J
Anthracene	50*	1 J	1 J	4 J	9 J
Benzo(ghi)perylene	NE	10 U	10 U	10 U	20 U
Fluoranthene	50*	1 J	2 J	8 J	10 J
Fluorene	50*	3 J	2 J	13	46
Naphthalene	10*	4 J	2 J	**14**	**270**
Phenanthrene	50*	2 J	8 J	3 J	**89**
Pyrene	50*	7 J	3 J	23	11 J
Total Non-Carcinogenic PAHs		28	18	111	528
Total PAHs		34	18	118	528
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	5 J	NA	10 U	NA
2-Methylphenol	1	10 U	NA	10 U	NA
4-Methylphenol	1	10 U	NA	10 U	NA
Bis(2-ethylhexyl)phthalate	5	3 J	NA	4 J	NA
Carbazole	NE	10 U	NA	10 U	NA
Di-n-butylphthalate	50	10 U	NA	10 U	NA
Dibenzofuran	NE	10 U	10 U	10 U	6 J
Diethylphthalate	50*	10 U	NA	10 U	NA
Isophorone	50*	10 U	NA	10 U	NA
Phenol	1	10 U	NA	10 U	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPMW-12I		RPMW-13I	
		RPMW-12I 03/09/2000 35-45	RPMW-12I 09/19/2002 35-45	RPMW-13I 03/13/2000 35-45	RPMW-13I 09/18/2002 35-45
Metals (ug/l)					
Aluminum	NE	585	NA	313	NA
Antimony	3	3 U	NA	3 U	NA
Arsenic	25	6.2 B	NA	4 U	NA
Barium	1000	26.1 B	NA	18.3 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	0.4 U	NA
Calcium	NE	32600	NA	20700	NA
Chloride (mg/l)	NE	54	NA	16	NA
Chromium	50	13.3 B	NA	**70.3**	NA
Cobalt	NE	0.3 U	NA	0.49 B	NA
Copper	200	31.8 B	NA	21.1 B	NA
Iron (mg/l)	0.3	**2.05**	NA	**1.07**	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	**65.6**	NA	20.8	NA
Magnesium	35000*	5680	NA	1490	NA
Manganese (mg/l)	0.3	0.0471 B	NA	0.017 B	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	0.14 U	NA	0.15 U	NA
Nickel	100	3.3 B	NA	1.8 B	NA
Potassium	NE	5090	NA	9490	NA
Selenium	10	4 U	NA	5.3 B	NA
Silver	50	2 U	NA	2 U	NA
Sodium	20000	**27500**	NA	11000	NA
Thallium	0.5*	3 U	NA	3 U	NA
Vanadium	NE	3.1 B	NA	2.9 B	NA
Zinc	2000*	66	NA	46.1 B	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	230	NA	130	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	0.0096 B	0.0091 B	0.0044 NB	0.0082 B
Cyanide (Dissolved) (ug/l)	NE	NA	NA	4	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4.0 UN	NA
Total Cyanide		0.0096	0.0091	0.012	0.0082

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-14I			RPMW-15I	
		RPMW-14I 03/09/2000 35-45	RPMW-14I 09/18/2002 35-45	RPMWXX091802-1 09/18/2002 35-45 (Dup)	RPMW-15I 03/06/2000 35-45	RPMW-15I 09/20/2002 35-45
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	**49**	1 U	1 U	**78**	1
Toluene	5	**350 D**	1 U	1 U	**7400 D**	**21**
Ethylbenzene	5	**1100 D**	1 U	1	**110**	1
Xylene (total)	5	**2700 D**	1 U	1	**14000 D**	**7**
Total BTEX		4199	0	2	21588	30
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	**82**	NA	NA	**540 D**	NA
1,3,5-Trimethylbenzene	5	**34**	NA	NA	**230 DJ**	NA
Acetone	50*	5 U	NA	NA	5 U	NA
Bromodichloromethane	50*	1 J	NA	NA	5 U	NA
Carbon disulfide	NE	5 U	NA	NA	5 U	NA
Chloroform	7	**18**	NA	NA	5 U	NA
Isopropylbenzene	5	**13**	NA	NA	5 U	NA
Methyl tert-butyl ether	2	5 U	NA	NA	5 U	NA
Styrene	5	**1000 D**	NA	NA	**6500 D**	NA
n-Propylbenzene	5	**9**	NA	NA	5 U	NA
sec-Butylbenzene	5	5 U	NA	NA	5 U	NA
p-Cymene	NE	5 U	NA	NA	3 J	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	**1 J**	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	**2 J**	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	**1 J**	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	4	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	8 J	10 U	10 U	30	10 U
Acenaphthene	20*	2 J	10 U	10 U	3 J	10 U
Acenaphthylene	NE	10 U	10 U	10 U	2 J	10 U
Anthracene	50*	10 U	10 U	10 U	1 J	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	1 J	10 U	10 U	4 J	10 U
Fluorene	50*	3 J	10 U	10 U	4 J	10 U
Naphthalene	10*	**130**	3 J	2 J	**35**	10 U
Phenanthrene	50*	7 J	10 U	10 U	11	10 U
Pyrene	50*	1 J	10 U	10 U	4 J	10 U
Total Non-Carcinogenic PAHs		152	3	2	94	0
Total PAHs		152	3	2	98	0
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	10 U	NA	NA	10 U	NA
2-Methylphenol	1	10 U	NA	NA	**55**	NA
4-Methylphenol	1	10 U	NA	NA	**5 J**	NA
Bis(2-ethylhexyl)phthalate	5	2 J	NA	NA	**15**	NA
Carbazole	NE	10 U	NA	NA	10 U	NA
Di-n-butylphthalate	50	10 U	NA	NA	10 U	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	50*	10 U	NA	NA	1 J	NA
Isophorone	50*	10 U	NA	NA	10 U	NA
Phenol	1	10 U	NA	NA	10 U	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-14I			RPMW-15I	
		RPMW-14I 03/09/2000 35-45	RPMW-14I 09/18/2002 35-45	RPMWXX091802-1 09/18/2002 35-45 (Dup)	RPMW-15I 03/06/2000 35-45	RPMW-15I 09/20/2002 35-45
Metals (ug/l)						
Aluminum	NE	217 B	NA	NA	548	NA
Antimony	3	3 U	NA	NA	**4.2 B**	NA
Arsenic	25	4.1 B	NA	NA	4 U	NA
Barium	1000	12.4 B	NA	NA	44.4 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	NA	1.1 B	NA
Calcium	NE	32100	NA	NA	78500	NA
Chloride (mg/l)	NE	32	NA	NA	750	NA
Chromium	50	28.1	NA	NA	30.2	NA
Cobalt	NE	0.3 U	NA	NA	1.2 B	NA
Copper	200	11.8 B	NA	NA	51.7	NA
Iron (mg/l)	0.3	0.282 B	NA	NA	**3.26**	**1.100**
Iron (Dissolved)	300	NA	NA	NA	NA	35 U
Lead	25	19.4	NA	NA	**56.1**	NA
Magnesium	35000*	3560	NA	NA	**43900**	NA
Manganese (mg/l)	0.3	0.0123 B	NA	NA	0.0382 B	0.136 JE
Manganese (Dissolved)	300	NA	NA	NA	NA	139 E
Mercury	0.7	0.14 U	NA	NA	0.14 U	NA
Nickel	100	2.1 B	NA	NA	5.3 B	NA
Potassium	NE	8320	NA	NA	27300	NA
Selenium	10	4 U	NA	NA	4 U	NA
Silver	50	2 U	NA	NA	3.8 B	NA
Sodium	20000	19200	NA	NA	**361000**	NA
Thallium	0.5*	3 U	NA	NA	3 U	NA
Vanadium	NE	4.3 B	NA	NA	3.5 B	NA
Zinc	2000*	7 B	NA	NA	155	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	NA	NA	NA	260
Sulfate	250	NA	NA	NA	NA	**680**
Residue, filterable	NE	200	NA	NA	1600	NA
Nitrate	10000	NA	NA	NA	NA	0.050 UJ
Cyanide (mg/l)						
Cyanide	0.2	0.004 U	0.0069 B	0.009 B	0.0209	0.0073 B
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	NA	4 U	NA
Total Cyanide		0	0.0069	0.009	0.0209	0.0073

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-16I	RPMW-16I	RPMW-17I		RPMW-18I
		RPMW-16I 03/10/2000 35-45	RPMW-16I 11/07/2002 35-45	RPMW-17I 03/14/2000 35-45	RPMW-17I 09/19/2002 35-45	RPMW-18I 09/18/2002 35-45
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	5 U	5 U	**30**	**2**	**38**
Toluene	5	**13**	5 U	**120**	1	20 U
Ethylbenzene	5	2 J	5 U	**88**	4	**770**
Xylene (total)	5	**14**	5 U	**140**	1	**360**
Total BTEX		29	0	378	8	1168
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	1 J	5 U	2 J	NA	NA
1,3,5-Trimethylbenzene	5	5 U	5 U	5 U	NA	NA
Acetone	50*	10	5 R	**84**	NA	NA
Bromodichloromethane	50*	2 J	5 U	5 U	NA	NA
Carbon disulfide	NE	5 U	5 U	5 U	NA	NA
Chloroform	7	**22**	3 J	**16**	NA	NA
Isopropylbenzene	5	5 U	5 U	1 J	NA	NA
Methyl tert-butyl ether	2	5 U	5 U	5 U	NA	NA
Styrene	5	**9**	5 U	5 U	NA	NA
n-Propylbenzene	5	5 U	5 U	5 U	NA	NA
sec-Butylbenzene	5	5 U	5 U	5 U	NA	NA
p-Cymene	NE	5 U	5 U	5 U	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U	200 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	200 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U	200 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	200 U
Chrysene	0.002*	10 U	10 U	10 U	10 U	200 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	200 U
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	2 J	10 U	1 J	10 U	200
Acenaphthene	20*	10 U	10 U	10 U	10 U	**320**
Acenaphthylene	NE	10 U	10 U	10 U	10 U	20 J
Anthracene	50*	10 U	10 U	10 U	10 U	200 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	200 U
Fluoranthene	50*	1 J	10 U	10 U	10 U	200 U
Fluorene	50*	2 J	10 U	10 U	10 U	**55 J**
Naphthalene	10*	6	10 U	**26**	10 U	**3200**
Phenanthrene	50*	6 J	10 U	2 J	10 U	**68 J**
Pyrene	50*	1 J	10 U	10 U	10 U	200 U
Total Non-Carcinogenic PAHs		18	0	29	0	3863
Total PAHs		18	0	29	0	3863
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	10 U	NA	10 U	NA	NA
2-Methylphenol	1	10 U	NA	10 U	NA	NA
4-Methylphenol	1	10 U	NA	10 U	NA	NA
Bis(2-ethylhexyl)phthalate	5	1 J	NA	1 J	NA	NA
Carbazole	NE	10 U	NA	10 U	NA	NA
Di-n-butylphthalate	50	10 U	NA	10 U	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	200 J
Diethylphthalate	50*	10 U	NA	10 U	NA	NA
Isophorone	50*	10 U	NA	10 U	NA	NA
Phenol	1	10 U	NA	10 U	NA	NA

Table 4-38 (continued)
Intermediate Groundwater Analytical Results (17-45 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-16I	RPMW-16I	RPMW-17I		RPMW-18I
		RPMW-16I 03/10/2000 35-45	RPMW-16I 11/07/2002 35-45	RPMW-17I 03/14/2000 35-45	RPMW-17I 09/19/2002 35-45	RPMW-18I 09/18/2002 35-45
Metals (ug/l)						
Aluminum	NE	342 E*	NA	48.3 B	NA	NA
Antimony	3	3 U	NA	3 U	NA	NA
Arsenic	25	8.3 B	NA	4 U	NA	NA
Barium	1000	23.6 B	NA	150 B	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	0.4 U	NA	NA
Calcium	NE	39900	122000	164000	NA	NA
Chloride (mg/l)	NE	40	NA	NA	NA	NA
Chromium	50	35	NA	37.6	NA	NA
Cobalt	NE	3.4 B	NA	0.94 B	NA	NA
Copper	200	37.7 B	NA	22.3 B	NA	NA
Iron (mg/l)	0.3	**0.437 E**	0.189	0.122 B	NA	NA
Iron (Dissolved)	300	NA	20 U	NA	NA	NA
Lead	25	13.3	NA	20.5	NA	NA
Magnesium	35000*	2130	NA	4180	NA	NA
Manganese (mg/l)	0.3	0.0109 B	0.0322	0.0023 B	NA	NA
Manganese (Dissolved)	300	NA	34.6	NA	NA	NA
Mercury	0.7	0.14 U	NA	0.14 U	NA	NA
Nickel	100	5 B	NA	2.1 B	NA	NA
Potassium	NE	5400	12100	130000	NA	NA
Selenium	10	4 U	NA	5.4 B	NA	NA
Silver	50	2.3 B	NA	2 U	NA	NA
Sodium	20000	18600	174000	**297000**	NA	NA
Thallium	0.5*	3 U	NA	3 U	NA	NA
Vanadium	NE	24.3 B	NA	12.4 B	NA	NA
Zinc	2000*	43.9 B	NA	15.2 B	NA	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	160	NA	NA	NA
Sulfate	250	NA	130	NA	NA	NA
Residue, filterable	NE	230	NA	1500	NA	NA
Nitrate	10000	NA	0.5 U	NA	NA	NA
Cyanide (mg/l)						
Cyanide	0.2	0.0055 B	0.005 U	0.0089 B	0.0061 B	0.014 B
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4 U	NA	NA
Total Cyanide		0.0055	0	0.0089	0.0061	0.014

Notes:
* guidance value
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
Shading/bolding indicates an exceedance of established New York State ambient groundwater quality standards (GA)
TCLP - Toxicity Characteristic Leaching Procedure
mg/L - milligrams/liter
ug/L - micrograms/liter or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons

Table 4-39
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-01	RPGP-02	RPGP-03	RPGP-06
		RPGP-01 (46-50)	RPGP-02 (46-50)	RPGP-03 (46-50)	RPGP-06 (46-50)
		02/08/2000	02/22/2000	02/15/2000	02/02/2000
		46-50	46-50	46-50	46-50
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	1 U	5 U
Toluene	5	1 U	1 U	1 U	5 U
Ethylbenzene	5	1 U	1 U	1 U	5 U
Xylene (total)	5	1 U	1 U	1 U	1 J
Total BTEX		0	0	0	1
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	5 U
1,3,5-Trimethylbenzene	5	NA	NA	NA	5 U
Acetone	50*	NA	NA	NA	5 U
Bromodichloromethane	50*	NA	NA	NA	5 U
Carbon disulfide	NE	NA	NA	NA	5 U
Chloroform	7	NA	NA	NA	5
Isopropylbenzene	5	NA	NA	NA	5 U
Methyl tert-butyl ether	2	NA	NA	NA	**9**
Styrene	5	NA	NA	NA	5 U
n-Propylbenzene	5	NA	NA	NA	5 U
sec-Butylbenzene	5	NA	NA	NA	5 U
p-Cymene	NE	NA	NA	NA	5 U
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	3 J	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U	5 U
Phenanthrene	50*	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	3	0
Total PAHs		0	0	3	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	10 U
2-Methylphenol	1	NA	NA	NA	10 U
4-Methylphenol	1	NA	NA	NA	10 U
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	10 U
Carbazole	NE	NA	NA	NA	10 U
Di-n-butylphthalate	50	NA	NA	NA	10 U
Dibenzofuran	NE	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	10 U
Isophorone	50*	NA	NA	NA	10 U
Phenol	1	NA	NA	NA	10 U

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-01	RPGP-02	RPGP-03	RPGP-06
		RPGP-01 (46-50)	RPGP-02 (46-50)	RPGP-03 (46-50)	RPGP-06 (46-50)
		02/08/2000	02/22/2000	02/15/2000	02/02/2000
		46-50	46-50	46-50	46-50
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-08	RPGP-09		
		RPGP-08 (46-50) 01/28/2000 46-50	RPGP-09 (86-90) 01/24/2000 86-90	RPGP-09 (66-70) 01/24/2000 66-70	RPGP-09 (46-50) 01/24/2000 46-50
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U
Xylene (total)	5	1 U	1 U	1 U	1 U
Total BTEX		0	0	0	0
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0	0
Total PAHs		0	0	0	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-08	RPGP-09		
		RPGP-08 (46-50) 01/28/2000 46-50	RPGP-09 (86-90) 01/24/2000 86-90	RPGP-09 (66-70) 01/24/2000 66-70	RPGP-09 (46-50) 01/24/2000 46-50
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-10			RPGP-12
		RPGP-10 (86-90) 02/24/2000 86-90	RPGP-10 (66-70) 02/24/2000 66-70	RPGP-10 (46-50) 02/24/2000 46-50	RPGP-12 (46-50) 02/14/2000 46-50
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U
Xylene (total)	5	1	1 U	1 U	1 U
Total BTEX		1	0	0	0
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0	0
Total PAHs		0	0	0	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-10			RPGP-12
		RPGP-10 (86-90) 02/24/2000 86-90	RPGP-10 (66-70) 02/24/2000 66-70	RPGP-10 (46-50) 02/24/2000 46-50	RPGP-12 (46-50) 02/14/2000 46-50
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-13	RPGP-14		
		RPGP-13 (46-50) 02/04/2000 46-50	RPGP-14 (86-90) 01/27/2000 86-90	RPGP-14 (66-70) 01/27/2000 66-70	RPGP-14 (46-50) 01/27/2000 46-50
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U
Xylene (total)	5	1 U	1 U	1 U	1 U
Total BTEX		0	0	0	0
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0	0
Total PAHs		0	0	0	0
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-13	RPGP-14		
		RPGP-13 (46-50) 02/04/2000 46-50	RPGP-14 (86-90) 01/27/2000 86-90	RPGP-14 (66-70) 01/27/2000 66-70	RPGP-14 (46-50) 01/27/2000 46-50
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPGP-15			RPGP-16	
		RPGP-15(86-90) 01/26/2000 86-90	RPGP-15(66-70) 01/26/2000 66-70	RPGP-15(46-50) 01/26/2000 46-50	RPGP-16 (71-75) 01/11/2000 71-75	RPGP-16 (51-55) 01/11/2000 51-55
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	1 U	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U
Xylene (total)	5	1	1 U	1 U	1 U	1 U
Total BTEX		1	0	0	0	0
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0	0	0
Total PAHs		0	0	0	0	0
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	NA	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPGP-15			RPGP-16	
		RPGP-15(86-90) 01/26/2000 86-90	RPGP-15(66-70) 01/26/2000 66-70	RPGP-15(46-50) 01/26/2000 46-50	RPGP-16 (71-75) 01/11/2000 71-75	RPGP-16 (51-55) 01/11/2000 51-55
Metals (ug/l)						
Aluminum	NE	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA	NA
Cyanide (mg/l)						
Cyanide	0.2	NA	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-20	RPGP-21		
		RPGP-20(52-56) 11/15/2001 52-56	RPGP-21(90-94) 11/19/2001 90-94	RPGP-21(80-84) 11/19/2001 80-84	RPGP-21(52-56) 11/19/2001 52-56
Volatile Organic Compounds (VOCs)					
BTEX (ug/l)					
Benzene	1	1 U	1 U	1 U	1 U
Toluene	5	1 U	1	1 U	1 U
Ethylbenzene	5	1 U	3	1 U	3
Xylene (total)	5	1 U	3	1 U	1
Total BTEX		0	7	0	4
Other Volatile Organic Compounds (ug/l)					
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHS (ug/l)					
Benzo(a)anthracene	0.002*	10 U	**3 J**	**1 J**	**1 J**
Benzo(a)pyrene	ND	10 U	2 J	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	**2 J**	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	**2 J**	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	9	1	1
Non-Carcinogenic PAHS (ug/l)					
2-Methylnaphthalene	NE	10 U	28	6 J	4 J
Acenaphthene	20*	2 J	**26**	6 J	5 J
Acenaphthylene	NE	10 U	6 J	2 J	3 J
Anthracene	50*	10 U	6 J	2 J	2 J
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	9 J	5 J	4 J
Fluorene	50*	10 U	20	5 J	4 J
Naphthalene	10*	2 J	**140**	**27**	**20**
Phenanthrene	50*	4 J	36	13	12
Pyrene	50*	1 J	11	5 J	4 J
Total Non-Carcinogenic PAHs		9	282	71	58
Total PAHs		9	291	72	59
Other Semivolatile Organic Compounds (ug/l)					
2,4-Dimethylphenol	50*	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA
Dibenzofuran	NE	10 U	13	3 J	2 J
Diethylphthalate	50*	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)			
		RPGP-20	RPGP-21		
		RPGP-20(52-56) 11/15/2001 52-56	RPGP-21(90-94) 11/19/2001 90-94	RPGP-21(80-84) 11/19/2001 80-84	RPGP-21(52-56) 11/19/2001 52-56
Metals (ug/l)					
Aluminum	NE	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)					
Alkalinity	NE	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA
Cyanide (mg/l)					
Cyanide	0.2	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPGP-22			RPGP-23	RPGP-24
		RPGP-22(90-94) 11/19/2001 90-94	RPGP-22(80-84) 11/20/2001 80-84	RPGP-22(52-56) 11/20/2001 52-56	RPGP-23(53-56) 11/20/2001 53-56	RPGP-24(52-56) 11/26/2001 52-56
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	1 U	1	1 U	**2**	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	5	1 U
Xylene (total)	5	1 U	1 U	1 U	1 U	1 U
Total BTEX		0	1	0	7	0
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA	NA
Acetone	50*	NA	NA	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA	NA	NA
Chloroform	7	NA	NA	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA	NA
Styrene	5	NA	NA	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA	NA
p-Cymene	NE	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHS (ug/l)						
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	10 U	10 U	10 U	17	10 U
Acenaphthene	20*	10 U	1 J	10 U	19	10 U
Acenaphthylene	NE	10 U	10 U	10 U	2 J	10 U
Anthracene	50*	10 U	10 U	10 U	2 J	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	2 J	10 U
Fluorene	50*	10 U	10 U	10 U	4 J	10 U
Naphthalene	10*	2 J	3 J	1 J	**66**	10 U
Phenanthrene	50*	10 U	2 J	10 U	7 J	10 U
Pyrene	50*	10 U	10 U	10 U	2 J	10 U
Total Non-Carcinogenic PAHs		2	6	1	121	0
Total PAHs		2	6	1	121	0
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	NA	NA	NA	NA	NA
2-Methylphenol	1	NA	NA	NA	NA	NA
4-Methylphenol	1	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA	NA
Carbazole	NE	NA	NA	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA	NA	NA
Isophorone	50*	NA	NA	NA	NA	NA
Phenol	1	NA	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPGP-22			RPGP-23	RPGP-24
		RPGP-22(90-94) 11/19/2001 90-94	RPGP-22(80-84) 11/20/2001 80-84	RPGP-22(52-56) 11/20/2001 52-56	RPGP-23(53-56) 11/20/2001 53-56	RPGP-24(52-56) 11/26/2001 52-56
Metals (ug/l)						
Aluminum	NE	NA	NA	NA	NA	NA
Antimony	3	NA	NA	NA	NA	NA
Arsenic	25	NA	NA	NA	NA	NA
Barium	1000	NA	NA	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA
Calcium	NE	NA	NA	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA
Chromium	50	NA	NA	NA	NA	NA
Cobalt	NE	NA	NA	NA	NA	NA
Copper	200	NA	NA	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA
Lead	25	NA	NA	NA	NA	NA
Magnesium	35000*	NA	NA	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA
Mercury	0.7	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA
Potassium	NE	NA	NA	NA	NA	NA
Selenium	10	NA	NA	NA	NA	NA
Silver	50	NA	NA	NA	NA	NA
Sodium	20000	NA	NA	NA	NA	NA
Thallium	0.5*	NA	NA	NA	NA	NA
Vanadium	NE	NA	NA	NA	NA	NA
Zinc	2000*	NA	NA	NA	NA	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA	NA
Residue, filterable	NE	NA	NA	NA	NA	NA
Nitrate	10000	NA	NA	NA	NA	NA
Cyanide (mg/l)						
Cyanide	0.2	NA	NA	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA
Total Cyanide		NA	NA	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft) RPGP-25 GP25-GW60-64 07/18/2002 60-64	RPGP-25 RPGP25-GW52-56 07/18/2002 52-56	RPGP-25 RPGP-25GW71-75 07/24/2002 71-75
Volatile Organic Compounds (VOCs)				
BTEX (ug/l)				
Benzene	1	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U
Xylene (total)	5	1 U	1 U	1 U
Total BTEX		0	0	0
Other Volatile Organic Compounds (ug/l)				
1,2,4-Trimethylbenzene	5	NA	NA	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA
Acetone	50*	NA	NA	NA
Bromodichloromethane	50*	NA	NA	NA
Carbon disulfide	NE	NA	NA	NA
Chloroform	7	NA	NA	NA
Isopropylbenzene	5	NA	NA	NA
Methyl tert-butyl ether	2	NA	NA	NA
Styrene	5	NA	NA	NA
n-Propylbenzene	5	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA
p-Cymene	NE	NA	NA	NA
Semivolatile Organic Compounds (SVOCs)				
Carcinogenic PAHS (ug/l)				
Benzo(a)anthracene	0.002*	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0
Non-Carcinogenic PAHS (ug/l)				
2-Methylnaphthalene	NE	10 U	10 U	10 U
Acenaphthene	20*	10 U	10 U	10 U
Acenaphthylene	NE	10 U	10 U	10 U
Anthracene	50*	10 U	10 U	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U
Naphthalene	10*	10 U	10 U	10 U
Phenanthrene	50*	10 U	10 U	10 U
Pyrene	50*	10 U	10 U	10 U
Total Non-Carcinogenic PAHs		0	0	0
Total PAHs		0	0	0
Other Semivolatile Organic Compounds (ug/l)				
2,4-Dimethylphenol	50*	NA	NA	NA
2-Methylphenol	1	NA	NA	NA
4-Methylphenol	1	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA
Carbazole	NE	NA	NA	NA
Di-n-butylphthalate	50	NA	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U
Diethylphthalate	50*	NA	NA	NA
Isophorone	50*	NA	NA	NA
Phenol	1	NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)		
		RPGP-25		
		GP25-GW60-64 07/18/2002 60-64	RPGP25-GW52-56 07/18/2002 52-56	RPGP-25GW71-75 07/24/2002 71-75
Metals (ug/l)				
Aluminum	NE	NA	NA	NA
Antimony	3	NA	NA	NA
Arsenic	25	NA	NA	NA
Barium	1000	NA	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA
Cadmium	5	NA	NA	NA
Calcium	NE	NA	NA	NA
Chloride (mg/l)	NE	NA	NA	NA
Chromium	50	NA	NA	NA
Cobalt	NE	NA	NA	NA
Copper	200	NA	NA	NA
Iron (mg/l)	0.3	NA	NA	NA
Iron (Dissolved)	300	NA	NA	NA
Lead	25	NA	NA	NA
Magnesium	35000*	NA	NA	NA
Manganese (mg/l)	0.3	NA	NA	NA
Manganese (Dissolved)	300	NA	NA	NA
Mercury	0.7	NA	NA	NA
Nickel	100	NA	NA	NA
Potassium	NE	NA	NA	NA
Selenium	10	NA	NA	NA
Silver	50	NA	NA	NA
Sodium	20000	NA	NA	NA
Thallium	0.5*	NA	NA	NA
Vanadium	NE	NA	NA	NA
Zinc	2000*	NA	NA	NA
Natural Attenuation Parameters (mg/l)				
Alkalinity	NE	NA	NA	NA
Sulfate	250	NA	NA	NA
Residue, filterable	NE	NA	NA	NA
Nitrate	10000	NA	NA	NA
Cyanide (mg/l)				
Cyanide	0.2	NA	NA	NA
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA
Total Cyanide		NA	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)						
		RPGP-27			RPGP-28A		RPMW-02D	
		RPGP27-GW52-56 07/23/2002 52-56	RPGPXX072302-1 07/23/2002 52-56 (Dup)	RPGP27-GW71-75 07/23/2002 71-75	RPGP28A-GW52-56 07/25/2002 52-56	RPGP28A-GW71-75 07/25/2002 71-75	RPMW-02D 03/16/2000 64-74	RPMW-02D 09/24/2002 64-74
Volatile Organic Compounds (VOCs)								
BTEX (ug/l)								
Benzene	1	1 U	1 U	1 U	1 U	1 U	**1700 D**	1
Toluene	5	1 U	1 U	1 U	**28**	1 U	**38 J**	1 U
Ethylbenzene	5	1 U	1 U	1 U	**93**	1 U	**120**	**37**
Xylene (total)	5	1 U	1 U	1 U	**220**	1 U	**740**	2
Total BTEX		0	0	0	341	0	2598	40
Other Volatile Organic Compounds (ug/l)								
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA	NA	**84**	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA	NA	**34 J**	NA
Acetone	50*	NA	NA	NA	NA	NA	50 U	NA
Bromodichloromethane	50*	NA	NA	NA	NA	NA	50 U	NA
Carbon disulfide	NE	NA	NA	NA	NA	NA	50 U	NA
Chloroform	7	NA	NA	NA	NA	NA	50 U	NA
Isopropylbenzene	5	NA	NA	NA	NA	NA	**22 J**	NA
Methyl tert-butyl ether	2	NA	NA	NA	NA	NA	50 U	NA
Styrene	5	NA	NA	NA	NA	NA	50 U	NA
n-Propylbenzene	5	NA	NA	NA	NA	NA	50 U	NA
sec-Butylbenzene	5	NA	NA	NA	NA	NA	50 U	NA
p-Cymene	NE	NA	NA	NA	NA	NA	50 U	NA
Semivolatile Organic Compounds (SVOCs)								
Carcinogenic PAHS (ug/l)								
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)								
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U	10 U	200 DJ	10 U
Acenaphthene	20*	10 U	10 U	10 U	10 U	10 U	**81**	10 U
Acenaphthylene	NE	10 U	10 U	10 U	10 U	10 U	31	4 J
Anthracene	50*	10 U	10 U	10 U	10 U	10 U	3 J	10 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U	10 U	2 J	10 U
Fluorene	50*	10 U	10 U	10 U	10 U	10 U	21	10 U
Naphthalene	10*	10 U	10 U	10 U	10 U	10 U	**3400 D**	6 J
Phenanthrene	50*	10 U	10 U	10 U	10 U	10 U	16	10 U
Pyrene	50*	10 UJ	10 UJ	10 UJ	10 U	10 U	2 J	10 U
Total Non-Carcinogenic PAHs		0	0	0	0	0	3756	10
Total PAHs		0	0	0	0	0	3756	10
Other Semivolatile Organic Compounds (ug/l)								
2,4-Dimethylphenol	50*	NA	NA	NA	NA	NA	10 U	NA
2-Methylphenol	1	NA	NA	NA	NA	NA	1 J	NA
4-Methylphenol	1	NA	NA	NA	NA	NA	1 J	NA
Bis(2-ethylhexyl)phthalate	5	NA	NA	NA	NA	NA	3 J	NA
Carbazole	NE	NA	NA	NA	NA	NA	10	NA
Di-n-butylphthalate	50	NA	NA	NA	NA	NA	10	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	10 U	4 J	10 U
Diethylphthalate	50*	NA	NA	NA	NA	NA	10 U	NA
Isophorone	50*	NA	NA	NA	NA	NA	10 U	NA
Phenol	1	NA	NA	NA	NA	NA	**4 J**	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)						
		RPGP-27			RPGP-28A		RPMW-02D	
		RPGP27-GW52-56 07/23/2002 52-56	RPGPXX072302-1 07/23/2002 52-56 (Dup)	RPGP27-GW71-75 07/23/2002 71-75	RPGP28A-GW52-56 07/25/2002 52-56	RPGP28A-GW71-75 07/25/2002 71-75	RPMW-02D 03/16/2000 64-74	RPMW-02D 09/24/2002 64-74
Metals (ug/l)								
Aluminum	NE	NA	NA	NA	NA	NA	202 B	NA
Antimony	3	NA	NA	NA	NA	NA	**3.6 B**	NA
Arsenic	25	NA	NA	NA	NA	NA	4 U	NA
Barium	1000	NA	NA	NA	NA	NA	51.4 BE	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA	NA	NA
Cadmium	5	NA	NA	NA	NA	NA	0.47 B	NA
Calcium	NE	NA	NA	NA	NA	NA	224000	NA
Chloride (mg/l)	NE	NA	NA	NA	NA	NA	9400	NA
Chromium	50	NA	NA	NA	NA	NA	2 U	NA
Cobalt	NE	NA	NA	NA	NA	NA	2.4 B	NA
Copper	200	NA	NA	NA	NA	NA	6.7 B	NA
Iron (mg/l)	0.3	NA	NA	NA	NA	NA	**1.12 E**	**2.65**
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA	35 U
Lead	25	NA	NA	NA	NA	NA	5.8 B	NA
Magnesium	35000*	NA	NA	NA	NA	NA	**397000 E**	NA
Manganese (mg/l)	0.3	NA	NA	NA	NA	NA	**0.414 E**	**0.355 E**
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA	**375 E**
Mercury	0.7	NA	NA	NA	NA	NA	0.15 U	NA
Nickel	100	NA	NA	NA	NA	NA	2.2 B	NA
Potassium	NE	NA	NA	NA	NA	NA	259000 E	NA
Selenium	10	NA	NA	NA	NA	NA	4 U	NA
Silver	50	NA	NA	NA	NA	NA	2 U	NA
Sodium	20000	NA	NA	NA	NA	NA	**4530000**	NA
Thallium	0.5*	NA	NA	NA	NA	NA	**6 B**	NA
Vanadium	NE	NA	NA	NA	NA	NA	350 E	NA
Zinc	2000*	NA	NA	NA	NA	NA	80.6	NA
Natural Attenuation Parameters (mg/l)								
Alkalinity	NE	NA	NA	NA	NA	NA	NA	240
Sulfate	250	NA	NA	NA	NA	NA	NA	**2600**
Residue, filterable	NE	NA	NA	NA	NA	NA	15000	NA
Nitrate	10000	NA	NA	NA	NA	NA	NA	0.36
Cyanide (mg/l)								
Cyanide	0.2	NA	NA	NA	0.0125 JB	0.0147 JB	0.075	0.020 U
Cyanide (Dissolved) (ug/l)	NE	NA	NA	NA	NA	NA	NA	NA
Cyanide, Free (ug/l)	NE	NA	NA	NA	NA	NA	4 U	NA
Total Cyanide		NA	NA	NA	0.0125	0.0147	0.075	0

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)						
		RPMW-03D		RPMW-07D		RPMW-08D	RPMW-09D	
		RPMW-03D 03/16/2000 65-75	RPMW-03D 09/23/2002 65-75	RPMW-07D 03/20/2000 65-75	RPMW-07D 09/24/2002 65-75	RPMW-08D 09/18/2002 65-75	RPMW-09D 03/21/2000 66-76	RPMW-09D 09/23/2002 66-76
Volatile Organic Compounds (VOCs)								
BTEX (ug/l)								
Benzene	1	5 U	1 U	**54**	**11**	1 U	**9300 D**	**9400 D**
Toluene	5	5 U	1 U	**21**	**15**	1 U	**450 D**	**640**
Ethylbenzene	5	5 U	1 U	5	**150**	1 U	**860 D**	**2100**
Xylene (total)	5	5 U	1 U	**93**	**74**	1 U	**1400 D**	**2200**
Total BTEX		0	0	173	250	0	12010	14340
Other Volatile Organic Compounds (ug/l)								
1,2,4-Trimethylbenzene	5	5 U	NA	**19**	NA	NA	**180**	NA
1,3,5-Trimethylbenzene	5	5 U	NA	**12**	NA	NA	**60**	NA
Acetone	50*	11	NA	5 U	NA	NA	5 U	NA
Bromodichloromethane	50*	3 J	NA	5 U	NA	NA	5 U	NA
Carbon disulfide	NE	5 U	NA	5 U	NA	NA	4 J	NA
Chloroform	7	**27**	NA	5 U	NA	NA	5 U	NA
Isopropylbenzene	5	5 U	NA	5 U	NA	NA	5 U	NA
Methyl tert-butyl ether	2	5 U	NA	5 U	NA	NA	5 U	NA
Styrene	5	5 U	NA	5 U	NA	NA	**270 D**	NA
n-Propylbenzene	5	5 U	NA	5 U	NA	NA	5 U	NA
sec-Butylbenzene	5	5 U	NA	5 U	NA	NA	5 U	NA
p-Cymene	NE	5 U	NA	5 U	NA	NA	5 U	NA
Semivolatile Organic Compounds (SVOCs)								
Carcinogenic PAHS (ug/l)								
Benzo(a)anthracene	0.002*	10 U	10 U	**1 J**	60 U	10 U	500 U	500 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	60 U	10 U	500 U	500 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	60 U	10 U	500 U	500 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	60 U	10 U	500 U	500 U
Chrysene	0.002*	10 U	10 U	1 J	60 U	10 U	500 U	500 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	60 U	10 U	500 U	500 U
Total Carcinogenic PAHs		0	0	2	0	0	0	0
Non-Carcinogenic PAHS (ug/l)								
2-Methylnaphthalene	NE	10 U	10 U	12	29 J	10 U	780	480 J
Acenaphthene	20*	10 U	10 U	11	11 J	10 U	500 U	500 U
Acenaphthylene	NE	10 U	10 U	21	60	10 U	220 J	110 J
Anthracene	50*	10 U	10 U	5 J	7 J	10 U	500 U	500 U
Benzo(ghi)perylene	NE	10 U	10 U	10 U	60 U	10 U	500 U	500 U
Fluoranthene	50*	10 U	10 U	5 J	7 J	10 U	500 U	500 U
Fluorene	50*	10 U	10 U	25	8 J	10 U	**94 J**	500 U
Naphthalene	10*	5 U	10 U	5 U	**480**	10 U	**6600**	**4500 B**
Phenanthrene	50*	10 U	10 U	31	29 J	10 U	**150 J**	500 U
Pyrene	50*	10 U	10 U	7 J	10 J	10 U	500 U	500 U
Total Non-Carcinogenic PAHs		0	0	117	641	0	7844	5090
Total PAHs		0	0	119	641	0	7844	5090
Other Semivolatile Organic Compounds (ug/l)								
2,4-Dimethylphenol	50*	10 U	NA	10 U	NA	NA	500 U	NA
2-Methylphenol	1	10 U	NA	10 U	NA	NA	500 U	NA
4-Methylphenol	1	10 U	NA	10 U	NA	NA	500 U	NA
Bis(2-ethylhexyl)phthalate	5	**9 J**	NA	2 JB	NA	NA	500 U	NA
Carbazole	NE	10 U	NA	10 U	NA	NA	500 U	NA
Di-n-butylphthalate	50	12	NA	10 U	NA	NA	500 U	NA
Dibenzofuran	NE	10 U	10 U	2 J	60 U	10 U	500 U	500 U
Diethylphthalate	50*	10 U	NA	10 U	NA	NA	500 U	NA
Isophorone	50*	10 U	NA	2 J	NA	NA	500 U	NA
Phenol	1	10 U	NA	10 U	NA	NA	500 U	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)						
		RPMW-03D		RPMW-07D		RPMW-08D	RPMW-09D	
		RPMW-03D 03/16/2000 65-75	RPMW-03D 09/23/2002 65-75	RPMW-07D 03/20/2000 65-75	RPMW-07D 09/24/2002 65-75	RPMW-08D 09/18/2002 65-75	RPMW-09D 03/21/2000 66-76	RPMW-09D 09/23/2002 66-76
Metals (ug/l)								
Aluminum	NE	411	NA	565	NA	NA	591	NA
Antimony	3	3 U	NA	3 U	NA	NA	3 U	NA
Arsenic	25	4 U	NA	5.4 B	NA	NA	6.3 B	NA
Barium	1000	28.5 BE	NA	80.6 B	NA	NA	80.7 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA	NA	42.2
Cadmium	5	2.6 B	NA	1.3 B	NA	NA	0.4 U	NA
Calcium	NE	44100	NA	277000	NA	NA	272000	NA
Chloride (mg/l)	NE	710	NA	17000	NA	NA	14000	14800
Chromium	50	2 U	NA	2 U	NA	NA	2 U	NA
Cobalt	NE	2.4 B	NA	0.3 U	NA	NA	0.3 U	NA
Copper	200	29.2 B	NA	9.8 B	NA	NA	5 U	NA
Iron (mg/l)	0.3	**0.464 E**	NA	**0.738**	**2.77**	NA	**0.5**	0.035 U
Iron (Dissolved)	300	NA	NA	NA	35 U	NA	NA	288
Lead	25	9.8 B	NA	10.4	NA	NA	3.9 B	NA
Magnesium	35000*	34300 E	NA	**626000**	NA	NA	**590000**	NA
Manganese (mg/l)	0.3	0.0285 BE	NA	**0.739**	**0.875 E**	NA	0.244	0.243
Manganese (Dissolved)	300	NA	NA	NA	**854 E**	NA	NA	227
Mercury	0.7	0.15 U	NA	0.15 U	NA	NA	0.15 U	NA
Nickel	100	3.9 B	NA	0.5 U	NA	NA	0.5 U	NA
Potassium	NE	15500 E	NA	396000	NA	NA	460000	NA
Selenium	10	4 U	NA	7.5 B	NA	NA	6.7 B	NA
Silver	50	2 U	NA	5.7 B	NA	NA	5.3 B	NA
Sodium	20000	**345000**	NA	**7750000**	NA	NA	**7170000**	NA
Thallium	0.5*	3 U	NA	3 U	NA	NA	3 U	NA
Vanadium	NE	89.1 E	NA	0.5 U	NA	NA	0.5 U	NA
Zinc	2000*	48.8 B	NA	4 U	NA	NA	4 U	NA
Natural Attenuation Parameters (mg/l)								
Alkalinity	NE	NA	NA	NA	540	NA	NA	280
Sulfate	250	NA	NA	NA	**1900**	NA	NA	**1600**
Residue, filterable	NE	1200	NA	28000	NA	NA	25000	20000
Nitrate	10000	NA	NA	NA	0.55	NA	NA	0.25 U
Cyanide (mg/l)								
Cyanide	0.2	0.004 U	0.020 UJ	0.004 U	0.020 U	0.005 U	0.004 U	0.020 UJ
Cyanide (Dissolved) (ug/l)	NE	NA	NA	4 U	NA	NA	4 U	NA
Cyanide, Free (ug/l)	NE	4 U	NA	4 U	NA	NA	4 U	NA
Total Cyanide		0	0	0	0	0	0	0

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)					
		RPMW-11D		RPMW-12D		RPMW-13D	
		RPMW-11D 03/18/2000 65-75	RPMW-11D 09/19/2002 65-75	RPMW-12D 03/20/2000 65-75	RPMW-12D 09/19/2002 65-75	RPMW-13D 03/18/2000 65-75	RPMW-13D 09/18/2002 65-75
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	**9**	1 U	5 U	1 U	**61**	**3**
Toluene	5	5 U	1 U	5 U	1 U	**110**	4
Ethylbenzene	5	**13**	1 U	5 U	1 U	**58**	**6**
Xylene (total)	5	**8**	1 U	2 J	1 U	**380**	**29**
Total BTEX		30	0	2	0	609	42
Other Volatile Organic Compounds (ug/l)							
1,2,4-Trimethylbenzene	5	2 J	NA	5 U	NA	**64**	NA
1,3,5-Trimethylbenzene	5	5 U	NA	2 J	NA	**25**	NA
Acetone	50*	5 U	NA	5 U	NA	5 U	NA
Bromodichloromethane	50*	5 U	NA	5 U	NA	5 U	NA
Carbon disulfide	NE	5 U	NA	5 U	NA	1 J	NA
Chloroform	7	5 U	NA	5 U	NA	5 U	NA
Isopropylbenzene	5	1 J	NA	5 U	NA	2 J	NA
Methyl tert-butyl ether	2	5 U	NA	5 U	NA	5 U	NA
Styrene	5	5 U	NA	5 U	NA	**470 D**	NA
n-Propylbenzene	5	5 U	NA	5 U	NA	5	NA
sec-Butylbenzene	5	5 U	NA	5 U	NA	5 U	NA
p-Cymene	NE	5 U	NA	5 U	NA	5 U	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	10 U	**2 J**	10 U	**4 J**	40 U
Benzo(a)pyrene	ND	10 U	10 U	2 J	10 U	3 J	40 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	**2 J**	10 U	**2 J**	40 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	**1 J**	40 U
Chrysene	0.002*	10 U	10 U	**2 J**	10 U	**4 J**	40 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	**1 J**	40 U
Total Carcinogenic PAHs		0	0	8	0	15	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	5 J	10 U	10 U	10 U	220 D	70
Acenaphthene	20*	3 J	10 U	3 J	10 U	13	16 J
Acenaphthylene	NE	2 J	10 U	9 J	10 U	170 D	120
Anthracene	50*	10 U	10 U	6 J	10 U	10	11 J
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	1 J	40 U
Fluoranthene	50*	10 U	10 U	6 J	10 U	9 J	7 J
Fluorene	50*	2 J	10 U	11	10 U	31	19 J
Naphthalene	10*	**110**	10 U	5 U	10 U	**700 D**	**620**
Phenanthrene	50*	4 J	10 U	2 J	10 U	42	**77**
Pyrene	50*	10 U	10 U	9 J	10 U	14	7 J
Total Non-Carcinogenic PAHs		126	0	46	0	1210	947
Total PAHs		126	0	54	0	1225	947
Other Semivolatile Organic Compounds (ug/l)							
2,4-Dimethylphenol	50*	10 U	NA	10 U	NA	10 U	NA
2-Methylphenol	1	10 U	NA	10 U	NA	10 U	NA
4-Methylphenol	1	10 U	NA	10 U	NA	10 U	NA
Bis(2-ethylhexyl)phthalate	5	1 J	NA	2 JB	NA	3 J	NA
Carbazole	NE	10 U	NA	10 U	NA	1 J	NA
Di-n-butylphthalate	50	10 U	NA	10 U	NA	10 U	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	5 J	6 J
Diethylphthalate	50*	10 U	NA	10 U	NA	10 U	NA
Isophorone	50*	10 U	NA	10 U	NA	10 U	NA
Phenol	1	10 U	NA	1 J	NA	10 U	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)					
		RPMW-11D		RPMW-12D		RPMW-13D	
		RPMW-11D 03/18/2000 65-75	RPMW-11D 09/19/2002 65-75	RPMW-12D 03/20/2000 65-75	RPMW-12D 09/19/2002 65-75	RPMW-13D 03/18/2000 65-75	RPMW-13D 09/18/2002 65-75
Metals (ug/l)							
Aluminum	NE	3590	NA	997	NA	190 B	NA
Antimony	3	3 U	NA	3 U	NA	3 U	NA
Arsenic	25	4 U	NA	4.1 B	NA	4 U	NA
Barium	1000	620	NA	52.3 B	NA	43.8 B	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	0.4 U	NA	0.4 U	NA
Calcium	NE	1650000	NA	231000	NA	209000	NA
Chloride (mg/l)	NE	15000	NA	11000	NA	12000	NA
Chromium	50	10.6 B	NA	2 U	NA	4.3 B	NA
Cobalt	NE	1.4 B	NA	0.3 U	NA	2.6 B	NA
Copper	200	38.2	NA	5 U	NA	90.8	NA
Iron (mg/l)	0.3	**1.67 E**	NA	**1.4**	**1.18**	**0.923 E**	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	2.3 U	NA	16.3	NA	3.6 B	NA
Magnesium	35000*	3410 E	NA	**478000**	NA	**523000 E**	NA
Manganese (mg/l)	0.3	0.0572 E	NA	0.0665	0.0487 B	0.0546 E	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Mercury	0.7	0.14 U	NA	0.14 U	NA	0.15 U	NA
Nickel	100	0.5 U	NA	0.5 U	NA	5.8 B	NA
Potassium	NE	792000 E	NA	334000	NA	544000 E	NA
Selenium	10	4 U	NA	6.4 B	NA	4 U	NA
Silver	50	19.5 B	NA	4.6 B	NA	5.1 B	NA
Sodium	20000	**3540000 E**	NA	**5410000**	NA	**2470000 E**	NA
Thallium	0.5*	3 U	NA	3 U	NA	3 U	NA
Vanadium	NE	0.5 U	NA	0.5 U	NA	0.5 U	NA
Zinc	2000*	46.8 B	NA	4 U	NA	11 B	NA
Natural Attenuation Parameters (mg/l)							
Alkalinity	NE	NA	NA	NA	160	NA	NA
Sulfate	250	NA	NA	NA	**1700**	NA	NA
Residue, filterable	NE	29000	NA	19000	NA	21000	NA
Nitrate	10000	NA	NA	NA	0.079	NA	NA
Cyanide (mg/l)							
Cyanide	0.2	0.004 U	0.005 U	0.004 U	0.007 JB	0.004 U	0.005 U
Cyanide (Dissolved) (ug/l)	NE	182	NA	4 U	NA	4 U	NA
Cyanide, Free (ug/l)	NE	182	NA	4 U	NA	4 U	NA
Total Cyanide		0.364	0	0	0.007	0	0

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)					
		RPMW-14D		RPMW-15D	RPMW-17D		RPMW-18D
		RPMW-14D 03/20/2000 66-76	RPMW-14D 09/18/2002 66-76	RPMW-15D 09/23/2002 65-75	RPMW-17D 03/17/2000 65-75	RPMW-17D 09/19/2002 65-75	RPMW-18D 09/19/2002 85-95
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	**3 J**	1 U	1 U	5 U	1 U	1 U
Toluene	5	5 U	1 U	1 U	5 U	1 U	1 U
Ethylbenzene	5	5	1 U	1 U	**30**	1 U	2
Xylene (total)	5	1 J	1 U	1 U	**81**	1 U	2
Total BTEX		9	0	0	111	0	4
Other Volatile Organic Compounds (ug/l)							
1,2,4-Trimethylbenzene	5	5 U	NA	NA	5 U	NA	NA
1,3,5-Trimethylbenzene	5	5 U	NA	NA	5 U	NA	NA
Acetone	50*	5 U	NA	NA	33	NA	NA
Bromodichloromethane	50*	5 U	NA	NA	3 J	NA	NA
Carbon disulfide	NE	5 U	NA	NA	5 U	NA	NA
Chloroform	7	5 U	NA	NA	**29**	NA	NA
Isopropylbenzene	5	5 U	NA	NA	5 U	NA	NA
Methyl tert-butyl ether	2	5 U	NA	NA	5 U	NA	NA
Styrene	5	5 U	NA	NA	5 U	NA	NA
n-Propylbenzene	5	5 U	NA	NA	5 U	NA	NA
sec-Butylbenzene	5	5 U	NA	NA	5 U	NA	NA
p-Cymene	NE	5 U	NA	NA	5 U	NA	NA
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	ND	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	0.002*	10 U	10 U	10 U	10 U	10 U	10 U
Total Carcinogenic PAHs		0	0	0	0	0	0
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	10 U	10 U	10 U	10 U	10 U	9 J
Acenaphthene	20*	10 U	10 U	10 U	10 U	10 U	2 J
Acenaphthylene	NE	10 U	10 U	10 U	10 U	10 U	14
Anthracene	50*	10 U	10 U	10 U	10 U	10 U	2 J
Benzo(ghi)perylene	NE	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50*	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	50*	10 U	10 U	10 U	10 U	10 U	5 J
Naphthalene	10*	5 U	2 J	10 U	5 U	10 U	**36**
Phenanthrene	50*	1 J	10 U	10 U	10 U	10 U	11
Pyrene	50*	1 J	10 U	10 U	10 U	10 U	1 J
Total Non-Carcinogenic PAHs		2	2	0	0	0	80
Total PAHs		2	2	0	0	0	80
Other Semivolatile Organic Compounds (ug/l)							
2,4-Dimethylphenol	50*	10 U	NA	NA	8 J	NA	NA
2-Methylphenol	1	10 U	NA	NA	10 U	NA	NA
4-Methylphenol	1	10 U	NA	NA	10 U	NA	NA
Bis(2-ethylhexyl)phthalate	5	2 JB	NA	NA	**12**	NA	NA
Carbazole	NE	10 U	NA	NA	10 U	NA	NA
Di-n-butylphthalate	50	10 U	NA	NA	10 U	NA	NA
Dibenzofuran	NE	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	50*	10 U	NA	NA	2 J	NA	NA
Isophorone	50*	10 U	NA	NA	10 U	NA	NA
Phenol	1	10 U	NA	NA	10 U	NA	NA

Table 4-39 (continued)
Deep Groundwater Analytical Results (45-90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)					
		RPMW-14D		RPMW-15D	RPMW-17D		RPMW-18D
		RPMW-14D 03/20/2000 66-76	RPMW-14D 09/18/2002 66-76	RPMW-15D 09/23/2002 65-75	RPMW-17D 03/17/2000 65-75	RPMW-17D 09/19/2002 65-75	RPMW-18D 09/19/2002 85-95
Metals (ug/l)							
Aluminum	NE	213 B	NA	NA	549	NA	NA
Antimony	3	3 U	NA	NA	3 U	NA	NA
Arsenic	25	9.6 B	NA	NA	4 U	NA	NA
Barium	1000	43.6 B	NA	NA	35.2 B	NA	NA
Bromide (mg/l)	2000*	NA	NA	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	NA	0.4 U	NA	NA
Calcium	NE	261000	NA	NA	26100	NA	NA
Chloride (mg/l)	NE	14000	NA	NA	200	NA	NA
Chromium	50	2 U	NA	NA	32	NA	NA
Cobalt	NE	0.3 U	NA	NA	4.9 B	NA	NA
Copper	200	68.5	NA	NA	109	NA	NA
Iron (mg/l)	0.3	**0.441**	NA	NA	**1.11**	NA	NA
Iron (Dissolved)	300	NA	NA	NA	NA	NA	NA
Lead	25	4.6 B	NA	NA	**52.4**	NA	NA
Magnesium	35000*	**567000**	NA	NA	13800	NA	NA
Manganese (mg/l)	0.3	0.0684	NA	NA	0.0182 B	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA	NA
Mercury	0.7	0.22 B	NA	NA	0.14 U	NA	NA
Nickel	100	0.5 U	NA	NA	23 B	NA	NA
Potassium	NE	443000	NA	NA	11100	NA	NA
Selenium	10	6.5 B	NA	NA	4 U	NA	NA
Silver	50	5.1 B	NA	NA	2 U	NA	NA
Sodium	20000	**6930000**	NA	NA	**105000**	NA	NA
Thallium	0.5*	3 U	NA	NA	3 U	NA	NA
Vanadium	NE	0.5 U	NA	NA	4.7 B	NA	NA
Zinc	2000*	4 U	NA	NA	194	NA	NA
Natural Attenuation Parameters (mg/l)							
Alkalinity	NE	NA	NA	NA	NA	NA	NA
Sulfate	250	NA	NA	NA	NA	NA	NA
Residue, filterable	NE	24000	NA	NA	440	NA	NA
Nitrate	10000	NA	NA	NA	NA	NA	NA
Cyanide (mg/l)							
Cyanide	0.2	0.004 U	0.0056 B	0.020 UJ	0.004 U	0.0052 B	0.0066 B
Cyanide (Dissolved) (ug/l)	NE	4 U	NA	NA	4 U	NA	NA
Cyanide, Free (ug/l)	NE	4 U	NA	NA	4 U	NA	NA
Total Cyanide		0	0.0056	0	0	0.0052	0.0066

Notes:

* guidance value
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
Shading/bolding indicates an exceedance of established New York State ambient groundwater quality standards (GA)
TCLP - Toxicity Characteristic Leaching Provedure
mg/L - milligrams/liter
ug/L - micrograms/liter or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons

Table 4-40
Deep Groundwater (2) Analytical Results (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-02D2	RPMW-07D2	RPMW-08D2	RPMW-09D2	
		RPMW-02D2 09/19/2002 95-105	RPMW-07D2 09/24/2002 95-105	RPMW-08D2 09/18/2002 95-105	RPMW-09D2 03/21/2000 95-105	RPMW-09D2 09/23/2002 95-105
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	1 U	**2**	1 U	**9800 D**	**16000 D**
Toluene	5	1 U	1 U	1 U	**250 DJ**	**1200**
Ethylbenzene	5	1 U	5	1 U	**180**	**1000**
Xylene (total)	5	1 U	1 U	1 U	**470**	**2400**
Total BTEX		0	7	0	10700	20600
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	NA	NA	NA	**12**	NA
1,3,5-Trimethylbenzene	5	NA	NA	NA	**20**	NA
Isopropylbenzene	5	NA	NA	NA	3 J	NA
Styrene	5	NA	NA	NA	**200 DJ**	NA
Semivolatile Organic Compounds (SVOCs)						
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	10 U	10	10 U	190	580 J
Acenaphthene	20*	10 U	5 J	10 U	19 J	750 U
Acenaphthylene	NE	10 U	12	10 U	99 J	210 J
Anthracene	50*	10 U	2 J	10 U	150 U	750 U
Fluoranthene	50*	10 U	10 U	10 U	150 U	750 U
Fluorene	50*	10 U	8 J	10 U	35 J	750 U
Naphthalene	10*	10 U	**24**	10 U	**1400**	**6500 B**
Phenanthrene	50	1 J	13	10 U	**62 J**	750 U
Pyrene	50*	10 U	1 J	10 U	16 J	750 U
Total Non-Carcinogenic PAHs		1	75	0	1821	7290
Total PAHs		1	75	0	1821	7290
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	NA	NA	NA	**65 J**	NA
Bis(2-ethylhexyl)phthalate (BEHP)	5	NA	NA	NA	150 U	NA
Dibenzofuran	NE	10 U	10 U	10 U	150 U	750 U
Phenol	1	NA	NA	NA	**23 J**	NA
Isophorone	50*	NA	NA	NA	150 U	NA

Table 4-40 (continued)
Deep Groundwater (2) Analytical Results (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-02D2	RPMW-07D2	RPMW-08D2	RPMW-09D2	
		RPMW-02D2 09/19/2002 95-105	RPMW-07D2 09/24/2002 95-105	RPMW-08D2 09/18/2002 95-105	RPMW-09D2 03/21/2000 95-105	RPMW-09D2 09/23/2002 95-105
Metals (ug/l)						
Aluminum	NE	NA	NA	NA	723	NA
Antimony	3	NA	NA	NA	3 U	NA
Arsenic	25	NA	NA	NA	7.3 B	NA
Barium	1000	NA	NA	NA	70.7 B	NA
Bromide (mg/l)	2*	NA	NA	NA	NA	**44.8**
Cadmium	5	NA	NA	NA	0.66 B	NA
Calcium	NE	NA	NA	NA	289000	NA
Chloride (mg/l)	NE	NA	NA	NA	19000	17200
Cobalt	NE	NA	NA	NA	0.3 U	NA
Copper	200	NA	NA	NA	5 U	NA
Iron (mg/l)	0.3	NA	NA	NA	**0.792**	**1.17**
Lead	25	NA	NA	NA	2.7 B	NA
Magnesium	35000*	NA	NA	NA	**629000**	NA
Manganese (mg/l)	0.3	NA	NA	NA	**0.773**	**0.524**
Manganese (Dissolved)	300	NA	NA	NA	NA	**523**
Potassium	NE	NA	NA	NA	407000	NA
Selenium	10	NA	NA	NA	8.3 B	NA
Silver	50	NA	NA	NA	5.9 B	NA
Sodium	20000	NA	NA	NA	**7990000**	NA
Zinc	2000*	NA	NA	NA	4 U	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	NA	NA	NA	770
Sulfate	250	NA	NA	NA	NA	**1200**
Residue, filterable	NE	NA	NA	NA	28000	27000
Cyanide (mg/l)						
Cyanide	0.2	0.020 UJ	0.020 U	0.005 U	0.004 U	0.020 UJ
Total Cyanide		0	0	0	0	0

Table 4-40 (continued)
Deep Groundwater (2) Analytical Results (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-12D2		RPMW-13D2		RPMW-14D2
		RPMW-12D2 03/20/2000 95-105	RPMW-12 D2 09/19/2002 95-105	RPMW-13D2 03/18/2000 95-105	RPMW-13D2 09/18/2002 95-105	RPMW-14D2 09/18/2002 95-105
Volatile Organic Compounds (VOCs)						
BTEX (ug/l)						
Benzene	1	1 J	1 U	**270 D**	**56**	1 U
Toluene	5	3 J	1 U	**390 D**	**74**	1 U
Ethylbenzene	5	4 J	1 U	**100**	**27**	1 U
Xylene (total)	5	**9**	1 U	**680 D**	**220 D**	1 U
Total BTEX		17	0	1440	377	0
Other Volatile Organic Compounds (ug/l)						
1,2,4-Trimethylbenzene	5	2 J	NA	**75**	NA	NA
1,3,5-Trimethylbenzene	5	1 J	NA	**26**	NA	NA
Isopropylbenzene	5	5 U	NA	**2 J**	NA	NA
Styrene	5	5 U	NA	**820 D**	NA	NA
Semivolatile Organic Compounds (SVOCs)						
Non-Carcinogenic PAHS (ug/l)						
2-Methylnaphthalene	NE	2 J	10 U	260	340 JD	10 U
Acenaphthene	20*	2 J	10 U	200 U	13 J	10 U
Acenaphthylene	NE	9 J	10 U	190 J	240 JD	10 U
Anthracene	50*	2 J	10 U	200 U	11 J	10 U
Fluoranthene	50*	2 J	10 U	200 U	5 J	10 U
Fluorene	50*	5 J	10 U	200 U	36 J	10 U
Naphthalene	10*	1 J	1 J	**1900**	**3800 D**	2 J
Phenanthrene	50	9 J	1 J	**81 J**	**57**	10 U
Pyrene	50*	3 J	10 U	20 J	7 J	10 U
Total Non-Carcinogenic PAHs		35	2	2451	4509	2
Total PAHs		35	2	2451	4509	2
Other Semivolatile Organic Compounds (ug/l)						
2,4-Dimethylphenol	50*	10 U	NA	200 U	NA	NA
Bis(2-ethylhexyl)phthalate (BEHP)	5	3 JB	NA	200 U	NA	NA
Dibenzofuran	NE	10 U	10 U	200 U	7 J	10 U
Phenol	1	10 U	NA	200 U	NA	NA
Isophorone	50*	4 J	NA	200 U	NA	NA

Table 4-40 (continued)
Deep Groundwater (2) Analytical Results (>90 feet)
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Site/Sample ID/Date/Screen Depth (ft)				
		RPMW-12D2		RPMW-13D2		RPMW-14D2
		RPMW-12D2 03/20/2000 95-105	RPMW-12 D2 09/19/2002 95-105	RPMW-13D2 03/18/2000 95-105	RPMW-13D2 09/18/2002 95-105	RPMW-14D2 09/18/2002 95-105
Metals (ug/l)						
Aluminum	NE	393	NA	87.5 B	NA	NA
Antimony	3	3 U	NA	**4.1 B**	NA	NA
Arsenic	25	5.9 B	NA	4 U	NA	NA
Barium	1000	54.3 B	NA	44.1 B	NA	NA
Bromide (mg/l)	2*	NA	NA	NA	NA	NA
Cadmium	5	0.4 U	NA	0.4 U	NA	NA
Calcium	NE	296000	NA	243000	NA	NA
Chloride (mg/l)	NE	14000	NA	17000	NA	NA
Cobalt	NE	0.3 U	NA	1.4 B	NA	NA
Copper	200	10.1 B	NA	74.9	NA	NA
Iron (mg/l)	0.3	**0.576**	**0.891**	**0.61 E**	NA	NA
Lead	25	2.3 U	NA	2.3 U	NA	NA
Magnesium	35000*	**621000**	NA	**622000 E**	NA	NA
Manganese (mg/l)	0.3	0.148	0.139	0.154 E	NA	NA
Manganese (Dissolved)	300	NA	NA	NA	NA	NA
Potassium	NE	395000	NA	746000 E	NA	NA
Selenium	10	7.1 B	NA	4 U	NA	NA
Silver	50	5.8 B	NA	5.8 B	NA	NA
Sodium	20000	**7880000**	NA	**3250000 E**	NA	NA
Zinc	2000*	4 U	NA	16.4 B	NA	NA
Natural Attenuation Parameters (mg/l)						
Alkalinity	NE	NA	340	NA	NA	NA
Sulfate	250	NA	**2300**	NA	NA	NA
Residue, filterable	NE	27000	NA	27000	NA	NA
Cyanide (mg/l)						
Cyanide	0.2	0.0293	0.0063 JB	0.004 U	0.0088 B	0.005 U
Total Cyanide		0.293	0.0063	0	0.0088	0

Notes:

* guidance value
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
Shading/bolding indicates an exceedance of established New York State ambient groundwater quality standards (GA)
TCLP - Toxicity Characteristic Leaching Procedure
mg/L - milligrams/liter
ug/L - micrograms/liter or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons

Table 4-41
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-1 0-0.3 RPSED02-1 (0.0-0) 10/09/2002	RPSED02-1 0.3-3 RPSED02-1 (0.3-3) 10/09/2002	RPSED02-1 0.3-3 (Dup) RPSEDXX100902 10/09/2002	RPSED02-2 0-0.3 RPSED02-2 (0-0.3) 10/09/2002	RPSED02-2 0.3-3 RPSED02-2 (0.3-3) 10/09/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	NE	NE	0.006 U	0.006 U	0.006 U	0.007 U	0.006 U
Toluene	NE	NE	0.006 U	0.006 U	0.006 U	0.007 U	0.006 U
Ethyl benzene	NE	NE	0.006 U	0.006 U	0.006 U	0.007 U	0.006 U
Xylene (total)	NE	NE	0.006 U	0.006 U	0.006 U	0.007 U	0.006 U
			0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,1,1-Trichloroethane	NE	NE	6 U	6 U	6 U	7 U	6 U
1,1,2,2-Tetrachloroethane	NE	NE	6 U	6 U	6 U	7 U	6 U
1,1,2-Trichloroethane	NE	NE	6 U	6 U	6 U	7 U	6 U
1,1-Dichloroethane	NE	NE	6 U	6 U	6 U	7 U	6 U
1,1-Dichloroethene	NE	NE	6 U	6 U	6 U	7 U	6 U
1,2-Dichloroethane	NE	NE	6 U	6 U	6 U	7 U	6 U
1,2-Dichloropropane	NE	NE	6 U	6 U	6 U	7 U	6 U
2-Butanone	NE	NE	6 U	6 U	6 U	7 U	6 U
2-Hexanone	NE	NE	6 U	6 U	6 U	7 U	6 U
4-Methyl-2-pentanone	NE	NE	6 U	6 U	6 U	7 U	6 U
Acetone	NE	NE	6 U	6 U	6 U	12	15
Bromodichloromethane	NE	NE	6 U	6 U	6 U	7 U	6 U
Bromoform	NE	NE	6 U	6 U	6 U	7 U	6 U
Bromomethane	NE	NE	6 UJ	6 U	6 U	7 UJ	6 UJ
Carbon disulfide	NE	NE	6 U	6 U	6 U	2 J	2 J
Carbon tetrachloride	NE	NE	6 U	6 U	6 U	7 U	6 U
Chlorobenzene	NE	NE	6 U	6 U	6 U	7 U	6 U
Chloroethane	NE	NE	6 UJ	6 U	6 U	7 UJ	6 UJ
Chloroform	NE	NE	6 U	6 U	6 U	7 U	6 U
Chloromethane	NE	NE	6 UJ	6 U	6 U	7 UJ	6 UJ
Dibromochloromethane	NE	NE	6 U	6 U	6 U	7 U	6 U
Methylene chloride	NE	NE	3 JB	2 JB	4 JB	7 U	3 JB
Styrene	NE	NE	6 U	6 U	6 U	7 U	6 U
Tetrachloroethene	NE	NE	6 U	6 U	6 U	7 U	6 U
Trichloroethene	NE	NE	6 U	6 U	6 U	7 U	6 U
Vinyl chloride	NE	NE	6 U	6 U	6 U	7 U	6 U
cis-1,2-Dichloroethene	NE	NE	6 U	6 U	6 U	7 U	6 U
cis-1,3-Dichloropropene	NE	NE	6 U	6 U	6 U	7 U	6 U
trans-1,2-Dichloroethene	NE	NE	6 U	6 U	6 U	7 U	6 U
trans-1,3-Dichloropropene	NE	NE	6 U	6 U	6 U	7 U	6 U
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.26	1.6	1.6 J	0.39 U	0.39 U	0.92	0.52
Benzo(a)pyrene	0.43	1.6	1.2 J	0.39 U	0.39 U	0.61	0.43
Benzo(b)fluoranthene	NE	NE	0.96 J	0.39 U	0.39 U	0.75	0.39 J
Benzo(k)fluoranthene	NE	NE	0.26 J	0.39 U	0.39 U	0.24 J	0.15 J
Chrysene	0.38	2.8	1.6 J	0.39 U	0.39 U	1	0.53
Dibenzo(a,h)anthracene	0.06	0.26	2 U	0.39 U	0.39 U	0.08 J	0.057 J
Indeno(1,2,3-cd)pyrene	NE	NE	0.45 J	0.39 U	0.39 U	0.37 J	0.19 J
Total Carcinogenic PAHs			6.07	0	0	3.97	2.27
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	0.07	0.67	2 U	0.39 U	0.39 U	0.059 J	0.41 U
Acenaphthene	0.02	0.5	2 U	0.39 U	0.39 U	0.49 U	0.41 U
Acenaphthylene	0.04	0.64	0.42 J	0.39 U	0.39 U	0.36 J	0.18 J
Anthracene	0.09	1.1	0.44 J	0.39 U	0.39 U	0.28 J	0.16 J
Benzo(g,h,i)perylene	NE	NE	0.54 J	0.39 U	0.39 U	0.41 J	0.22 J
Fluoranthene	0.6	5.1	1.7 J	0.39 U	0.39 U	1.3	0.68
Fluorene	0.02	0.54	2 U	0.39 U	0.39 U	0.078 J	0.052 J
Naphthalene	0.16	2.1	2 U	0.39 U	0.39 U	0.081 J	0.41 U
Phenanthrene	0.24	1.5	0.91 J	0.39 U	0.39 U	0.73	0.37 J
Pyrene	0.67	2.6	4	0.39 U	0.39 U	2.1	1.5
Total Non-Carcinogenic PAHs	NE	NE	8.01	0	0	5.40	3.16
Total PAHs	4.02	44.8	14.08	0	0	9.37	5.43

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-1 0-0.3 RPSED02-1 (0.0-0) 10/09/2002	RPSED02-1 0.3-3 RPSED02-1 (0.3-3) 10/09/2002	RPSED02-1 0.3-3 (Dup) RPSEDXX100902 10/09/2002	RPSED02-2 0-0.3 RPSED02-2 (0-0.3) 10/09/2002	RPSED02-2 0.3-3 RPSED02-2 (0.3-3) 10/09/2002
Other Semivolatile Organic Compounds (ug/kg)							
1,2,4-Trichlorobenzene	NE	NE	2000 U	390 U	390 U	490 U	410 U
1,2-Dichlorobenzene	NE	NE	2000 U	390 U	390 U	490 U	410 U
1,3-Dichlorobenzene	NE	NE	2000 U	390 U	390 U	490 U	410 U
1,4-Dichlorobenzene	NE	NE	2000 U	390 U	390 U	490 U	410 U
2,4,5-Trichlorophenol	NE	NE	4000 U	790 U	790 U	1000 U	830 U
2,4,6-Trichlorophenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
2,4-Dichlorophenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
2,4-Dimethylphenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
2,4-Dinitrophenol	NE	NE	4000 U	790 U	790 U	1000 U	830 U
2,4-Dinitrotoluene	NE	NE	2000 U	390 U	390 U	490 U	410 U
2,6-Dinitrotoluene	NE	NE	2000 U	390 U	390 U	490 U	410 U
2-Chloronaphthalene	NE	NE	2000 U	390 U	390 U	490 U	410 U
2-Chlorophenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
2-Methylphenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
2-Nitroaniline	NE	NE	4000 U	790 U	790 U	1000 U	830 U
2-Nitrophenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
3,3-Dichlorobenzidine	NE	NE	2000 U	390 U	390 U	490 U	410 U
3-Nitroaniline	NE	NE	4000 UJ	790 U	790 U	1000 UJ	830 U
4,6-Dinitro-2-methylphenol	NE	NE	4000 U	790 U	790 U	1000 U	830 U
4-Chloro-3-methylphenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
4-Chloroaniline	NE	NE	2000 U	390 U	390 U	490 UJ	410 U
4-Methylphenol	NE	NE	2000 U	390 U	390 U	490 U	410 U
4-Nitroaniline	NE	NE	4000 UJ	790 U	790 U	1000 UJ	830 U
4-Nitrophenol	NE	NE	4000 UJ	790 U	790 U	1000 UJ	830 U
4-bromophenyl-phenylether	NE	NE	2000 U	390 U	390 U	490 U	410 U
4-chlorophenyl-phenylether	NE	NE	2000 U	390 U	390 U	490 U	410 U
Benzene, hydroxy-	NE	NE	2000 U	390 U	470	98 J	64 J
Bis(2-chloro-1-methylethyl) ether	NE	NE	2000 U	390 U	390 U	490 U	410 U
Bis(2-chloroethoxy)methane	NE	NE	2000 U	390 U	390 U	490 U	410 U
Bis(2-chloroethyl)ether	NE	NE	2000 U	390 U	390 U	490 U	410 U
Bis(2-ethylhexyl)phthalate	NE	NE	2000 U	390 U	390 U	250 J	76 J
Butylbenzylphthalate	NE	NE	2000 U	390 U	390 U	490 U	410 U
Carbazole	NE	NE	2000 UJ	390 U	390 U	490 UJ	410 U
Di-n-butylphthalate	NE	NE	2000 U	390 U	390 U	490 U	410 U
Di-n-octylphthalate	NE	NE	2000 U	390 U	390 U	430 J	410 U
Dibenzofuran	NE	NE	2000 U	390 U	390 U	490 U	410 U
Diethylphthalate	NE	NE	2000 U	390 U	390 U	490 U	410 U
Dimethylphthalate	NE	NE	2000 U	390 U	390 U	490 U	410 U
Hexachlorobenzene	NE	NE	2000 U	390 U	390 U	490 U	410 U
Hexachlorobutadiene	NE	NE	2000 U	390 U	390 U	490 U	410 U
Hexachlorocyclopentadiene	NE	NE	2000 U	390 U	390 U	490 U	410 U
Hexachloroethane	NE	NE	2000 U	390 U	390 U	490 U	410 U
Isophorone	NE	NE	2000 U	390 U	390 U	490 U	410 U
N-Nitroso-di-n-propylamine	NE	NE	2000 U	390 U	390 U	490 U	410 U
N-Nitrosodiphenylamine (1)	NE	NE	2000 U	390 U	390 U	490 U	410 U
Nitrobenzene	NE	NE	2000 U	390 U	390 U	490 U	410 U
Pentachlorophenol	NE	NE	4000 U	790 U	790 U	1000 U	830 U
Total Cyanide (mg/kg)							
Cyanide	NE	NE	0.17 U	0.16 U	0.15 U	0.22 UJ	0.18 UJ
Total Organic Carbon (%)							
TOC	NE	NE	0.3	0.1	0.2	2.6	3.3

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-3 0-0.3 RPSED02-3 (0-0.3) 10/09/2002	RPSED02-3 0.3-3 RPSED02-3 (0.3-3) 10/09/2002	RPSED02-4 0-0.3 RPSED02-4 (0-0.3) 10/09/2002	RPSED02-4 0.3-3 RPSED02-4 (0.3-3) 10/09/2002	RPSED02-5 0-0.3 RPSED02-5 (0.0-0) 10/09/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	NE	NE	0.006 U	0.007 U	0.006 U	0.006 U	0.006 U
Toluene	NE	NE	0.002 J	0.007 U	0.006 U	0.006 U	0.006 U
Ethyl benzene	NE	NE	0.006 U	0.007 U	0.006 U	0.006 U	0.006 U
Xylene (total)	NE	NE	0.006 U	0.007 U	0.006 U	0.006 U	0.006 U
			0.002	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,1,1-Trichloroethane	NE	NE	6 U	7 U	6 U	6 U	6 U
1,1,2,2-Tetrachloroethane	NE	NE	6 U	7 U	6 U	6 U	6 U
1,1,2-Trichloroethane	NE	NE	6 U	7 U	6 U	6 U	6 U
1,1-Dichloroethane	NE	NE	6 U	7 U	6 U	6 U	6 U
1,1-Dichloroethene	NE	NE	6 U	7 U	6 U	6 U	6 U
1,2-Dichloroethane	NE	NE	6 U	7 U	6 U	6 U	6 U
1,2-Dichloropropane	NE	NE	6 U	7 U	6 U	6 U	6 U
2-Butanone	NE	NE	6 U	7 U	6 U	6 U	6 U
2-Hexanone	NE	NE	6 U	7 U	6 U	6 U	6 U
4-Methyl-2-pentanone	NE	NE	6 UJ	7 U	6 U	6 U	6 UJ
Acetone	NE	NE	50	21	6 U	6 J	5 J
Bromodichloromethane	NE	NE	6 U	7 U	6 U	6 U	6 U
Bromoform	NE	NE	6 U	7 U	6 U	6 U	6 U
Bromomethane	NE	NE	6 U	7 UJ	6 UJ	6 UJ	6 U
Carbon disulfide	NE	NE	6 U	2 J	6 U	6 U	6 U
Carbon tetrachloride	NE	NE	6 U	7 U	6 U	6 U	6 U
Chlorobenzene	NE	NE	4 J	7 U	6 U	6 U	6 U
Chloroethane	NE	NE	6 U	7 UJ	6 UJ	6 UJ	6 U
Chloroform	NE	NE	6 U	7 U	6 U	6 U	6 U
Chloromethane	NE	NE	6 U	7 UJ	6 UJ	6 UJ	6 U
Dibromochloromethane	NE	NE	6 U	7 U	6 U	6 U	6 U
Methylene chloride	NE	NE	5 JB	3 JB	2 JB	2 JB	3 JB
Styrene	NE	NE	6 U	7 U	6 U	6 U	6 U
Tetrachloroethene	NE	NE	6 U	7 U	6 U	6 U	6 U
Trichloroethene	NE	NE	6 U	7 U	6 U	6 U	6 U
Vinyl chloride	NE	NE	6 U	7 U	6 U	6 U	6 U
cis-1,2-Dichloroethene	NE	NE	6 U	7 U	6 U	6 U	6 U
cis-1,3-Dichloropropene	NE	NE	6 U	7 U	6 U	6 U	6 U
trans-1,2-Dichloroethene	NE	NE	6 U	7 U	6 U	6 U	6 U
trans-1,3-Dichloropropene	NE	NE	6 U	7 U	6 U	6 U	6 U
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.26	1.6	0.49 J	2.1 J	0.18 J	0.044 J	0.34 J
Benzo(a)pyrene	0.43	1.6	0.37 J	1.7 J	0.18 J	0.4 U	0.27 J
Benzo(b)fluoranthene	NE	NE	0.44 J	1.7 J	0.14 J	0.4 U	0.21 J
Benzo(k)fluoranthene	NE	NE	2 U	0.66 J	0.075 J	0.4 U	0.07 J
Chrysene	0.38	2.8	0.57 J	2.2 J	0.18 J	0.4 U	0.33 J
Dibenzo(a,h)anthracene	0.06	0.26	2 U	2.2 U	0.38 UJ	0.4 U	0.41 U
Indeno(1,2,3-cd)pyrene	NE	NE	0.23 J	0.78 J	0.38 UJ	0.4 U	0.096 J
Total Carcinogenic PAHs			2.1	9.14	0.755	0.04	1.32
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	0.07	0.67	2 U	2.2 U	0.38 UJ	0.4 U	0.41 U
Acenaphthene	0.02	0.5	2 U	2.2 U	0.38 UJ	0.4 U	0.41 U
Acenaphthylene	0.04	0.64	0.25 J	0.8 J	0.045 J	0.4 U	0.11 J
Anthracene	0.09	1.1	2 U	0.65 J	0.059 J	0.4 U	0.12 J
Benzo(g,h,i)perylene	NE	NE	0.26 J	0.86 J	0.38 UJ	0.4 U	0.12 J
Fluoranthene	0.6	5.1	0.62 J	3.2	0.2 J	0.042 J	0.41
Fluorene	0.02	0.54	2 U	0.26 J	0.38 UJ	0.4 U	0.41 U
Naphthalene	0.16	2.1	2 U	0.28 J	0.38 UJ	0.4 U	0.41 U
Phenanthrene	0.24	1.5	0.34 J	1.8 J	0.14 J	0.4 U	0.21 J
Pyrene	0.67	2.6	1.1 J	5.2	0.67 J	0.11 J	0.82
Total Non-Carcinogenic PAHs	NE	NE	2.57	13.05	1.11	0.15	1.79
Total PAHs	4.02	44.8	4.67	22.19	1.87	0.20	3.11

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-3 0-0.3 RPSED02-3 (0-0.3) 10/09/2002	RPSED02-3 0.3-3 RPSED02-3 (0.3-3) 10/09/2002	RPSED02-4 0-0.3 RPSED02-4 (0-0.3) 10/09/2002	RPSED02-4 0.3-3 RPSED02-4 (0.3-3) 10/09/2002	RPSED02-5 0-0.3 RPSED02-5 (0.0-0) 10/09/2002
Other Semivolatile Organic Compounds (ug/kg)							
1,2,4-Trichlorobenzene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
1,2-Dichlorobenzene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
1,3-Dichlorobenzene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
1,4-Dichlorobenzene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2,4,5-Trichlorophenol	NE	NE	4000 U	4500 U	780 UJ	820 U	830 U
2,4,6-Trichlorophenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2,4-Dichlorophenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2,4-Dimethylphenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2,4-Dinitrophenol	NE	NE	4000 U	4500 U	780 UJ	820 U	830 U
2,4-Dinitrotoluene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2,6-Dinitrotoluene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2-Chloronaphthalene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2-Chlorophenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2-Methylphenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
2-Nitroaniline	NE	NE	4000 U	4500 U	780 UJ	820 U	830 U
2-Nitrophenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
3,3-Dichlorobenzidine	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
3-Nitroaniline	NE	NE	4000 UJ	4500 UJ	780 UJ	820 U	830 UJ
4,6-Dinitro-2-methylphenol	NE	NE	4000 U	4500 U	780 UJ	820 U	830 U
4-Chloro-3-methylphenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
4-Chloroaniline	NE	NE	2000 UJ	2200 UJ	380 UJ	400 U	410 UJ
4-Methylphenol	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
4-Nitroaniline	NE	NE	4000 UJ	4500 UJ	780 UJ	820 U	830 UJ
4-Nitrophenol	NE	NE	4000 UJ	4500 UJ	780 UJ	820 U	830 UJ
4-bromophenyl-phenylether	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
4-chlorophenyl-phenylether	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Benzene, hydroxy-	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Bis(2-chloro-1-methylethyl) ether	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Bis(2-chloroethoxy)methane	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Bis(2-chloroethyl)ether	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Bis(2-ethylhexyl)phthalate	NE	NE	2000 U	2200 U	81 J	400 U	64 J
Butylbenzylphthalate	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Carbazole	NE	NE	2000 UJ	2200 UJ	380 UJ	400 U	410 UJ
Di-n-butylphthalate	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Di-n-octylphthalate	NE	NE	2000 U	2200 U	1200 J	180 J	410 U
Dibenzofuran	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Diethylphthalate	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Dimethylphthalate	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Hexachlorobenzene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Hexachlorobutadiene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Hexachlorocyclopentadiene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Hexachloroethane	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Isophorone	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
N-Nitroso-di-n-propylamine	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
N-Nitrosodiphenylamine (1)	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Nitrobenzene	NE	NE	2000 U	2200 U	380 UJ	400 U	410 U
Pentachlorophenol	NE	NE	4000 U	4500 U	780 UJ	820 U	830 U
Total Cyanide (mg/kg)							
Cyanide	NE	NE	0.17 UJ	0.18 UJ	0.17 U	0.17 U	0.18 UJ
Total Organic Carbon (%)							
TOC	NE	NE	1.2	3.5	0.3	0.2	0.6

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-5 0.3-3 RPSED02-5 (0.3-3) 10/09/2002	RPSED02-6 0-0.3 RPSED02-6 (0-0.3) 10/09/2002	RPSED02-6 0.3-1.9 RPSED02-6 (0.3-1) 10/09/2002	RPSED02-6 1.9-2.4 RPSED02-6 (1.9-2) 10/09/2002	RPSED02-6 2.4-4.4 RPSED02-6 (2.4-4) 10/09/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	NE	NE	0.005 U	0.007 UJ	0.002 J	0.052 U	0.006 U
Toluene	NE	NE	0.005 U	0.007 UJ	0.006 U	0.052 U	0.006 U
Ethyl benzene	NE	NE	0.005 U	0.011 J	0.16	1.2	0.003 J
Xylene (total)	NE	NE	0.005 U	0.007 UJ	0.002 J	0.073	0.006 U
			0	0.011	0.16	1.27	0.003
Other Volatile Organic Compounds (ug/kg)							
1,1,1-Trichloroethane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
1,1,2,2-Tetrachloroethane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
1,1,2-Trichloroethane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
1,1-Dichloroethane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
1,1-Dichloroethene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
1,2-Dichloroethane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
1,2-Dichloropropane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
2-Butanone	NE	NE	5 U	7 UJ	6 U	52 U	6 U
2-Hexanone	NE	NE	5 U	7 UJ	6 U	52 U	6 U
4-Methyl-2-pentanone	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Acetone	NE	NE	9	44 J	15	52 U	6 J
Bromodichloromethane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Bromoform	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Bromomethane	NE	NE	5 UJ	7 UJ	6 U	52 U	6 UJ
Carbon disulfide	NE	NE	5 U	7 UJ	2 J	52 U	6 U
Carbon tetrachloride	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Chlorobenzene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Chloroethane	NE	NE	5 UJ	7 UJ	6 U	52 U	6 UJ
Chloroform	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Chloromethane	NE	NE	5 UJ	7 UJ	6 U	52 U	6 UJ
Dibromochloromethane	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Methylene chloride	NE	NE	4 JB	3 JJB	4 J	36 J	3 JB
Styrene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Tetrachloroethene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Trichloroethene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Vinyl chloride	NE	NE	5 U	7 UJ	6 U	52 U	6 U
cis-1,2-Dichloroethene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
cis-1,3-Dichloropropene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
trans-1,2-Dichloroethene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
trans-1,3-Dichloropropene	NE	NE	5 U	7 UJ	6 U	52 U	6 U
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.26	1.6	0.1 J	1.8 J	9.2	29	0.08 J
Benzo(a)pyrene	0.43	1.6	0.11 J	1.1 J	7.3	24	0.041 J
Benzo(b)fluoranthene	NE	NE	0.1 J	1.2 J	5.8	18	0.39 U
Benzo(k)fluoranthene	NE	NE	0.04 J	0.44 J	2.1 J	8.5	0.39 U
Chrysene	0.38	2.8	0.11 J	1.8 J	8.9	30	0.069 J
Dibenzo(a,h)anthracene	0.06	0.26	0.38 UJ	2.3 U	0.65 J	2.8 J	0.39 U
Indeno(1,2,3-cd)pyrene	NE	NE	0.38 UJ	0.61 J	2.7	8.3	0.39 U
Total Carcinogenic PAHs			0.46	6.95	36.65	120.6	0.19
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	0.07	0.67	0.38 UJ	2.3 U	0.44 J	1.8 J	0.39 U
Acenaphthene	0.02	0.5	0.38 UJ	1.6 J	8.8	53	0.33 J
Acenaphthylene	0.04	0.64	0.045 J	0.63 J	3.4	11	0.045 J
Anthracene	0.09	1.1	0.38 UJ	0.6 J	3.1	13	0.093 J
Benzo(g,h,i)perylene	NE	NE	0.38 UJ	0.63 J	3	8.6	0.39 U
Fluoranthene	0.6	5.1	0.11 J	2.3	12	36	0.15 J
Fluorene	0.02	0.54	0.38 UJ	2.3 U	0.81 J	2.7 J	0.39 U
Naphthalene	0.16	2.1	0.38 UJ	2.3 U	1.7 J	7.1	0.39 U
Phenanthrene	0.24	1.5	0.056 J	1.2 J	4.1	14	0.4
Pyrene	0.67	2.6	0.34 J	4.2	23	54	0.26 J
Total Non-Carcinogenic PAHs	NE	NE	0.55	11.16	60.35	201.2	1.28
Total PAHs	4.02	44.8	1.01	18.11	97	321.8	1.47

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-5 0.3-3 RPSED02-5 (0.3-3) 10/09/2002	RPSED02-6 0-0.3 RPSED02-6 (0-0.3) 10/09/2002	RPSED02-6 0.3-1.9 RPSED02-6 (0.3-1) 10/09/2002	RPSED02-6 1.9-2.4 RPSED02-6 (1.9-2) 10/09/2002	RPSED02-6 2.4-4.4 RPSED02-6 (2.4-4) 10/09/2002
Other Semivolatile Organic Compounds (ug/kg)							
1,2,4-Trichlorobenzene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
1,2-Dichlorobenzene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
1,3-Dichlorobenzene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
1,4-Dichlorobenzene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2,4,5-Trichlorophenol	NE	NE	760 UJ	4600 U	4300 U	12000 U	780 U
2,4,6-Trichlorophenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2,4-Dichlorophenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2,4-Dimethylphenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2,4-Dinitrophenol	NE	NE	760 UJ	4600 U	4300 U	12000 U	780 U
2,4-Dinitrotoluene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2,6-Dinitrotoluene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2-Chloronaphthalene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2-Chlorophenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2-Methylphenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
2-Nitroaniline	NE	NE	760 UJ	4600 U	4300 U	12000 U	780 U
2-Nitrophenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
3,3-Dichlorobenzidine	NE	NE	380 UJ	2300 U	2100 U	6100 UJ	390 U
3-Nitroaniline	NE	NE	760 UJ	4600 UJ	4300 UJ	12000 UJ	780 U
4,6-Dinitro-2-methylphenol	NE	NE	760 UJ	4600 U	4300 U	12000 U	780 U
4-Chloro-3-methylphenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
4-Chloroaniline	NE	NE	380 UJ	2300 UJ	2100 UJ	6100 UJ	390 U
4-Methylphenol	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
4-Nitroaniline	NE	NE	760 UJ	4600 UJ	4300 UJ	12000 UJ	780 U
4-Nitrophenol	NE	NE	760 UJ	4600 UJ	4300 UJ	12000 U	780 U
4-bromophenyl-phenylether	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
4-chlorophenyl-phenylether	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Benzene, hydroxy-	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Bis(2-chloro-1-methylethyl) ether	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Bis(2-chloroethoxy)methane	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Bis(2-chloroethyl)ether	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Bis(2-ethylhexyl)phthalate	NE	NE	380 UJ	420 J	2100 U	6100 U	390 U
Butylbenzylphthalate	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Carbazole	NE	NE	380 UJ	2300 UJ	550 J	2600 J	390 U
Di-n-butylphthalate	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Di-n-octylphthalate	NE	NE	380 UJ	330 J	2100 U	6100 U	390 U
Dibenzofuran	NE	NE	380 UJ	2300 U	2100 U	980 J	390 U
Diethylphthalate	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Dimethylphthalate	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Hexachlorobenzene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Hexachlorobutadiene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Hexachlorocyclopentadiene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Hexachloroethane	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Isophorone	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
N-Nitroso-di-n-propylamine	NE	NE	380 UJ	2300 U	2100 U	6100 UJ	390 U
N-Nitrosodiphenylamine (1)	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Nitrobenzene	NE	NE	380 UJ	2300 U	2100 U	6100 U	390 U
Pentachlorophenol	NE	NE	760 UJ	4600 U	4300 U	12000 U	780 U
Total Cyanide (mg/kg)							
Cyanide	NE	NE	NA	0.21 UJ	0.19 UJ	0.16 UJ	NA
Total Organic Carbon (%)							
TOC	NE	NE	0.1	3.4	1.5	0.2	NA

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-7 0-0.3 RPSED02-7(0.0-0) 10/09/2002	RPSED02-7 0.3-3 RPSED02-7 (0.3-3) 10/09/2002	RPSED02-8 0-0.3 RPSED02-8 (0-0.3) 10/09/2002	RPSED02-8 0.3-3 RPSED02-8 (0.3-3) 10/09/2002	RPSED02-9 0-0.3 RPSED02-9 (0-0.3) 10/09/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	NE	NE	0.006 U	0.006 U	0.006 U	0.006 U	0.007 U
Toluene	NE	NE	0.006 U	0.006 U	0.006 U	0.006 U	0.007 U
Ethyl benzene	NE	NE	0.006 U	0.006 U	0.006 U	0.006 U	0.007 U
Xylene (total)	NE	NE	0.006 U	0.006 U	0.006 U	0.006 U	0.007 U
			0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,1,1-Trichloroethane	NE	NE	6 U	6 U	6 U	6 U	7 U
1,1,2,2-Tetrachloroethane	NE	NE	6 U	6 U	6 U	6 U	7 U
1,1,2-Trichloroethane	NE	NE	6 U	6 U	6 U	6 U	7 U
1,1-Dichloroethane	NE	NE	6 U	6 U	6 U	6 U	7 U
1,1-Dichloroethene	NE	NE	6 U	6 U	6 U	6 U	7 U
1,2-Dichloroethane	NE	NE	6 U	6 U	6 U	6 U	7 U
1,2-Dichloropropane	NE	NE	6 U	6 U	6 U	6 U	7 U
2-Butanone	NE	NE	6 U	6 U	6 U	6 U	7 U
2-Hexanone	NE	NE	6 U	6 U	6 U	6 U	7 U
4-Methyl-2-pentanone	NE	NE	6 U	6 U	6 U	6 U	7 U
Acetone	NE	NE	6 U	8	6 U	6 U	22
Bromodichloromethane	NE	NE	6 U	6 U	6 U	6 U	7 U
Bromoform	NE	NE	6 U	6 U	6 U	6 U	7 U
Bromomethane	NE	NE	6 JU	6 UJ	6 UJ	6 U	7 UJ
Carbon disulfide	NE	NE	6 U	1 J	6 U	6 U	2 J
Carbon tetrachloride	NE	NE	6 U	6 U	6 U	6 U	7 U
Chlorobenzene	NE	NE	6 U	6 U	6 U	6 U	7 U
Chloroethane	NE	NE	6 JU	6 UJ	6 UJ	6 U	7 UJ
Chloroform	NE	NE	6 U	6 U	6 U	6 U	7 U
Chloromethane	NE	NE	6 JU	6 UJ	6 UJ	6 U	7 UJ
Dibromochloromethane	NE	NE	6 U	6 U	6 U	6 U	7 U
Methylene chloride	NE	NE	2 JB	3 JB	3 JB	3 JB	3 JB
Styrene	NE	NE	6 U	6 U	6 U	6 U	7 U
Tetrachloroethene	NE	NE	6 U	6 U	6 U	6 U	7 U
Trichloroethene	NE	NE	6 U	6 U	6 U	6 U	7 U
Vinyl chloride	NE	NE	6 U	6 U	6 U	6 U	7 U
cis-1,2-Dichloroethene	NE	NE	6 U	6 U	6 U	6 U	7 U
cis-1,3-Dichloropropene	NE	NE	6 U	6 U	6 U	6 U	7 U
trans-1,2-Dichloroethene	NE	NE	6 U	6 U	6 U	6 U	7 U
trans-1,3-Dichloropropene	NE	NE	6 U	6 U	6 U	6 U	7 U
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.26	1.6	0.4 JU	2	0.09 J	0.4 UJ	1.2 J
Benzo(a)pyrene	0.43	1.6	0.4 JU	1.9 J	0.073 J	0.4 UJ	1 J
Benzo(b)fluoranthene	NE	NE	0.4 JU	1.6 J	0.065 J	0.4 UJ	0.9 J
Benzo(k)fluoranthene	NE	NE	0.4 JU	0.68 J	0.39 U	0.4 UJ	0.26 J
Chrysene	0.38	2.8	0.4 JU	2	0.077 J	0.4 UJ	1.3 J
Dibenzo(a,h)anthracene	0.06	0.26	0.4 JU	0.17 J	0.39 U	0.4 UJ	2.3 U
Indeno(1,2,3-cd)pyrene	NE	NE	0.4 JU	0.46 J	0.39 U	0.4 UJ	0.47 J
Total Carcinogenic PAHs			0	8.3	0.31	0	5.13
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	0.07	0.67	0.4 JU	0.092 J	0.39 U	0.4 UJ	2.3 U
Acenaphthene	0.02	0.5	0.4 JU	0.4 UJ	0.39 U	0.4 UJ	2.3 U
Acenaphthylene	0.04	0.64	0.4 JU	0.39 J	0.39 U	0.4 UJ	0.39 J
Anthracene	0.09	1.1	0.4 JU	0.5 J	0.39 U	0.4 UJ	0.37 J
Benzo(g,h,i)perylene	NE	NE	0.4 JU	0.54 J	0.39 U	0.4 UJ	0.47 J
Fluoranthene	0.6	5.1	0.4 JU	1.8 J	0.087 J	0.4 UJ	1.6 J
Fluorene	0.02	0.54	0.4 JU	0.11 J	0.39 U	0.4 UJ	2.3 U
Naphthalene	0.16	2.1	0.4 JU	0.12 J	0.39 U	0.4 UJ	2.3 U
Phenanthrene	0.24	1.5	0.4 JU	0.82 J	0.048 J	0.4 UJ	0.58 J
Pyrene	0.67	2.6	0.058 J	6.5 JE	0.2 J	0.4 UJ	3.2
Total Non-Carcinogenic PAHs	NE	NE	0.06	10.87	0.34	0.00	6.61
Total PAHs	4.02	44.8	0.06	19.17	0.64	0.00	11.74

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-7 0-0.3 RPSED02-7(0.0-0) 10/09/2002	RPSED02-7 0.3-3 RPSED02-7 (0.3-3) 10/09/2002	RPSED02-8 0-0.3 RPSED02-8 (0-0.3) 10/09/2002	RPSED02-8 0.3-3 RPSED02-8 (0.3-3) 10/09/2002	RPSED02-9 0-0.3 RPSED02-9 (0-0.3) 10/09/2002
Other Semivolatile Organic Compounds (ug/kg)							
1,2,4-Trichlorobenzene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
1,2-Dichlorobenzene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
1,3-Dichlorobenzene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
1,4-Dichlorobenzene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
2,4,5-Trichlorophenol	NE	NE	820 JU	800 UJ	790 U	810 U	4800 U
2,4,6-Trichlorophenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
2,4-Dichlorophenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
2,4-Dimethylphenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
2,4-Dinitrophenol	NE	NE	820 JU	800 UJ	790 U	810 U	4800 U
2,4-Dinitrotoluene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
2,6-Dinitrotoluene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
2-Chloronaphthalene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
2-Chlorophenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
2-Methylphenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
2-Nitroaniline	NE	NE	820 JU	800 UJ	790 U	810 UJ	4800 U
2-Nitrophenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
3,3-Dichlorobenzidine	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
3-Nitroaniline	NE	NE	820 JU	800 UJ	790 U	810 UJ	4800 UJ
4,6-Dinitro-2-methylphenol	NE	NE	820 JU	800 UJ	790 U	810 U	4800 U
4-Chloro-3-methylphenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
4-Chloroaniline	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 UJ
4-Methylphenol	NE	NE	400 JU	400 UJ	390 U	400 U	2300 U
4-Nitroaniline	NE	NE	820 JU	800 UJ	790 U	810 UJ	4800 UJ
4-Nitrophenol	NE	NE	820 JU	800 UJ	790 U	810 U	4800 UJ
4-bromophenyl-phenylether	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
4-chlorophenyl-phenylether	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Benzene, hydroxy-	NE	NE	78 J	400 UJ	75 J	400 U	2300 U
Bis(2-chloro-1-methylethyl) ether	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Bis(2-chloroethoxy)methane	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Bis(2-chloroethyl)ether	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Bis(2-ethylhexyl)phthalate	NE	NE	57 J	45 J	390 U	400 UJ	240 J
Butylbenzylphthalate	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Carbazole	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 UJ
Di-n-butylphthalate	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Di-n-octylphthalate	NE	NE	400 JU	400 UJ	180 J	400 UJ	400 J
Dibenzofuran	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Diethylphthalate	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Dimethylphthalate	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Hexachlorobenzene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Hexachlorobutadiene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Hexachlorocyclopentadiene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Hexachloroethane	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Isophorone	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
N-Nitroso-di-n-propylamine	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
N-Nitrosodiphenylamine (1)	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Nitrobenzene	NE	NE	400 JU	400 UJ	390 U	400 UJ	2300 U
Pentachlorophenol	NE	NE	820 JU	800 UJ	790 U	810 U	4800 U
Total Cyanide (mg/kg)							
Cyanide	NE	NE	0.16 JU	NA	NA	0.16 UJ	0.35 JB
Total Organic Carbon (%)							
TOC	NE	NE	0.03	0.3	0.3	0.1	1.6

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-9 0.3-3 RPSED02-9 (0.3-3) 10/09/2002	RPSEDBG-A 0.00 RPSEDBG-A 10/09/2002	RPSEDBG-B 0.00 RPSEDBG-B 10/09/2002	RPSEDBG-C 0.00 RPSEDBG-C 10/09/2002	RPSEDBG-D 0.00 RPSEDBG-D 10/09/2002
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	NE	NE	0.006 U	0.016 UJ	0.006 U	0.007 U	0.007 U
Toluene	NE	NE	0.006 U	0.016 UJ	0.006 U	0.007 U	0.007 U
Ethyl benzene	NE	NE	0.006 U	0.016 UJ	0.006 U	0.007 U	0.007 U
Xylene (total)	NE	NE	0.006 U	0.016 UJ	0.006 U	0.007 U	0.007 U
			0	0	0	0	0
Other Volatile Organic Compounds (ug/kg)							
1,1,1-Trichloroethane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
1,1,2,2-Tetrachloroethane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
1,1,2-Trichloroethane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
1,1-Dichloroethane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
1,1-Dichloroethene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
1,2-Dichloroethane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
1,2-Dichloropropane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
2-Butanone	NE	NE	6 U	16 UJ	6 U	7 U	7 U
2-Hexanone	NE	NE	6 U	16 UJ	6 U	7 U	7 U
4-Methyl-2-pentanone	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Acetone	NE	NE	25	84 J	6 U	7 U	52
Bromodichloromethane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Bromoform	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Bromomethane	NE	NE	6 UJ	16 UJ	6 U	7 U	7 U
Carbon disulfide	NE	NE	2 J	16 UJ	6 U	7 U	3 J
Carbon tetrachloride	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Chlorobenzene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Chloroethane	NE	NE	6 UJ	16 UJ	6 U	7 U	7 U
Chloroform	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Chloromethane	NE	NE	6 UJ	16 UJ	6 U	7 U	7 U
Dibromochloromethane	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Methylene chloride	NE	NE	3 JB	11 JB	2 JB	4 JB	3 JB
Styrene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Tetrachloroethene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Trichloroethene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Vinyl chloride	NE	NE	6 U	16 UJ	6 U	7 U	7 U
cis-1,2-Dichloroethene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
cis-1,3-Dichloropropene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
trans-1,2-Dichloroethene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
trans-1,3-Dichloropropene	NE	NE	6 U	16 UJ	6 U	7 U	7 U
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.26	1.6	1.9 J	0.51 J	0.42 U	0.1 J	0.63
Benzo(a)pyrene	0.43	1.6	1.5 J	0.41 J	0.42 U	0.084 J	0.52
Benzo(b)fluoranthene	NE	NE	1.4 J	0.45 J	0.42 U	0.065 J	0.45 J
Benzo(k)fluoranthene	NE	NE	0.61 J	0.17 J	0.42 U	0.46 U	0.19 J
Chrysene	0.38	2.8	1.8 J	0.52 J	0.42 U	0.1 J	0.65
Dibenzo(a,h)anthracene	0.06	0.26	2.1 U	1.1 U	0.42 U	0.46 U	0.071 J
Indeno(1,2,3-cd)pyrene	NE	NE	0.69 J	0.19 J	0.42 U	0.46 U	0.28 J
Total Carcinogenic PAHs			7.9	2.25	0	0.35	2.79
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	0.07	0.67	2.1 U	1.1 U	0.42 U	0.46 U	0.48 U
Acenaphthene	0.02	0.5	2.1 U	1.1 U	0.42 U	0.46 U	0.48 U
Acenaphthylene	0.04	0.64	0.43 J	0.14 J	0.42 U	0.46 U	0.16 J
Anthracene	0.09	1.1	0.59 J	0.83 J	0.42 U	0.46 U	0.66
Benzo(g,h,i)perylene	NE	NE	0.74 J	0.21 J	0.42 U	0.46 U	0.29 J
Fluoranthene	0.6	5.1	2.8	0.77 J	0.42 U	0.1 J	0.77
Fluorene	0.02	0.54	0.24 J	0.24 J	0.42 U	0.46 U	0.12 J
Naphthalene	0.16	2.1	2.1 U	1.1 U	0.42 U	0.46 U	0.078 J
Phenanthrene	0.24	1.5	1.7 J	0.69 J	0.42 U	0.46 U	0.56
Pyrene	0.67	2.6	5	1 J	0.42 U	0.23 J	1.4
Total Non-Carcinogenic PAHs	NE	NE	11.5	3.88	0.00	0.33	4.04
Total PAHs	4.02	44.8	19.4	6.13	0.00	0.68	6.83

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSED02-9 0.3-3 RPSED02-9 (0.3-3) 10/09/2002	RPSEDBG-A 0.00 RPSEDBG-A 10/09/2002	RPSEDBG-B 0.00 RPSEDBG-B 10/09/2002	RPSEDBG-C 0.00 RPSEDBG-C 10/09/2002	RPSEDBG-D 0.00 RPSEDBG-D 10/09/2002
Other Semivolatile Organic Compounds (ug/kg)							
1,2,4-Trichlorobenzene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
1,2-Dichlorobenzene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
1,3-Dichlorobenzene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
1,4-Dichlorobenzene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2,4,5-Trichlorophenol	NE	NE	4300 U	2300 U	850 U	920 U	970 U
2,4,6-Trichlorophenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2,4-Dichlorophenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2,4-Dimethylphenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2,4-Dinitrophenol	NE	NE	4300 U	2300 U	850 U	920 U	970 U
2,4-Dinitrotoluene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2,6-Dinitrotoluene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2-Chloronaphthalene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2-Chlorophenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2-Methylphenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
2-Nitroaniline	NE	NE	4300 U	2300 U	850 U	920 U	970 U
2-Nitrophenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
3,3-Dichlorobenzidine	NE	NE	2100 U	1100 U	420 U	460 U	480 U
3-Nitroaniline	NE	NE	4300 U	2300 UJ	850 UJ	920 U	970 U
4,6-Dinitro-2-methylphenol	NE	NE	4300 U	2300 U	850 U	920 U	970 U
4-Chloro-3-methylphenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
4-Chloroaniline	NE	NE	2100 U	1100 UJ	420 UJ	460 U	480 U
4-Methylphenol	NE	NE	2100 U	1100 U	420 U	460 U	480 U
4-Nitroaniline	NE	NE	4300 U	2300 UJ	850 UJ	920 U	970 U
4-Nitrophenol	NE	NE	4300 U	2300 UJ	850 UJ	920 U	970 U
4-bromophenyl-phenylether	NE	NE	2100 U	1100 U	420 U	460 U	480 U
4-chlorophenyl-phenylether	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Benzene, hydroxy-	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Bis(2-chloro-1-methylethyl) ether	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Bis(2-chloroethoxy)methane	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Bis(2-chloroethyl)ether	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Bis(2-ethylhexyl)phthalate	NE	NE	2100 U	710 J	47 J	54 J	240 J
Butylbenzylphthalate	NE	NE	2100 U	1100 U	420 U	460 U	150 J
Carbazole	NE	NE	2100 U	190 J	420 UJ	460 U	88 J
Di-n-butylphthalate	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Di-n-octylphthalate	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Dibenzofuran	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Diethylphthalate	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Dimethylphthalate	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Hexachlorobenzene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Hexachlorobutadiene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Hexachlorocyclopentadiene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Hexachloroethane	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Isophorone	NE	NE	2100 U	1100 U	420 U	460 U	480 U
N-Nitroso-di-n-propylamine	NE	NE	2100 U	1100 U	420 U	460 U	480 U
N-Nitrosodiphenylamine (1)	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Nitrobenzene	NE	NE	2100 U	1100 U	420 U	460 U	480 U
Pentachlorophenol	NE	NE	4300 U	2300 U	850 U	920 U	970 U
Total Cyanide (mg/kg)							
Cyanide	NE	NE	0.18 UJ	0.49 U	0.18 U	0.17 U	0.21 U
Total Organic Carbon (%)							
TOC	NE	NE	1.4	18	0.8	0.9	5.6

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSEDBG-E 0.00 RPSEDBG-E 10/09/2002	RPSEDBG-F 0.00 RPSEDBG-F 10/09/2002	RPSEDBG-G 0.00 RPSEDBG-G 10/09/2002	RPSEDBG-H 0.00 RPSEDBG-H 10/09/2002
Volatile Organic Compounds (VOCs)						
BTEX (mg/kg)						
Benzene	NE	NE	0.006 U	0.006 U	0.006 U	0.006 U
Toluene	NE	NE	0.006 U	0.006 U	0.006 U	0.006 U
Ethyl benzene	NE	NE	0.006 U	0.008	0.006 U	0.006 U
Xylene (total)	NE	NE	0.006 U	0.006 U	0.006 U	0.006 U
			0	0.008	0	0
Other Volatile Organic Compounds (ug/kg)						
1,1,1-Trichloroethane	NE	NE	6 U	6 U	6 U	6 U
1,1,2,2-Tetrachloroethane	NE	NE	6 U	6 U	6 U	6 U
1,1,2-Trichloroethane	NE	NE	6 U	6 U	6 U	6 U
1,1-Dichloroethane	NE	NE	6 U	6 U	6 U	6 U
1,1-Dichloroethene	NE	NE	6 U	6 U	6 U	6 U
1,2-Dichloroethane	NE	NE	6 U	6 U	6 U	6 U
1,2-Dichloropropane	NE	NE	6 U	6 U	6 U	6 U
2-Butanone	NE	NE	6 U	6 U	6 U	6 U
2-Hexanone	NE	NE	6 U	6 U	6 U	6 U
4-Methyl-2-pentanone	NE	NE	6 U	6 U	6 U	6 U
Acetone	NE	NE	6 U	6 U	8	6 U
Bromodichloromethane	NE	NE	6 U	6 U	6 U	6 U
Bromoform	NE	NE	6 U	6 U	6 U	6 U
Bromomethane	NE	NE	6 U	6 U	6 U	6 U
Carbon disulfide	NE	NE	6 U	6 U	6 U	6 U
Carbon tetrachloride	NE	NE	6 U	6 U	6 U	6 U
Chlorobenzene	NE	NE	6 U	6 U	6 U	6 U
Chloroethane	NE	NE	6 U	6 U	6 U	6 U
Chloroform	NE	NE	6 U	6 U	6 U	6 U
Chloromethane	NE	NE	6 U	6 U	6 U	6 U
Dibromochloromethane	NE	NE	6 U	6 U	6 U	6 U
Methylene chloride	NE	NE	4 J	2 JB	2 J	3 JB
Styrene	NE	NE	6 U	6 U	6 U	6 U
Tetrachloroethene	NE	NE	6 U	6 U	6 U	6 U
Trichloroethene	NE	NE	6 U	6 U	6 U	6 U
Vinyl chloride	NE	NE	6 U	6 U	6 U	6 U
cis-1,2-Dichloroethene	NE	NE	6 U	6 U	6 U	6 U
cis-1,3-Dichloropropene	NE	NE	6 U	6 U	6 U	6 U
trans-1,2-Dichloroethene	NE	NE	6 U	6 U	6 U	6 U
trans-1,3-Dichloropropene	NE	NE	6 U	6 U	6 U	6 U
Semivolatile Organic Compounds (SVOCs)						
Carcinogenic PAHs (mg/kg)						
Benzo(a)anthracene	0.26	1.6	0.41 U	0.4 U	0.3 J	0.22 J
Benzo(a)pyrene	0.43	1.6	0.41 U	0.4 U	0.27 J	0.19 J
Benzo(b)fluoranthene	NE	NE	0.41 U	0.4 U	0.22 J	0.2 J
Benzo(k)fluoranthene	NE	NE	0.41 U	0.4 U	0.086 J	0.078 J
Chrysene	0.38	2.8	0.41 U	0.4 U	0.36 J	0.22 J
Dibenzo(a,h)anthracene	0.06	0.26	0.41 U	0.4 U	0.42 U	0.4 U
Indeno(1,2,3-cd)pyrene	NE	NE	0.41 U	0.4 U	0.13 J	0.11 J
Total Carcinogenic PAHs			0	0	1.37	1.018
Non-Carcinogenic PAHs (mg/kg)						
2-Methylnaphthalene	0.07	0.67	0.41 U	0.4 U	0.42 U	0.4 U
Acenaphthene	0.02	0.5	0.41 U	0.4 U	0.42 U	0.4 U
Acenaphthylene	0.04	0.64	0.41 U	0.4 U	0.086 J	0.048 J
Anthracene	0.09	1.1	0.41 U	0.4 U	0.08 J	0.059 J
Benzo(g,h,i)perylene	NE	NE	0.41 U	0.4 U	0.14 J	0.12 J
Fluoranthene	0.6	5.1	0.41 U	0.4 U	0.42 J	0.31 J
Fluorene	0.02	0.54	0.41 U	0.4 U	0.42 U	0.4 U
Naphthalene	0.16	2.1	0.41 U	0.4 U	0.42 U	0.4 U
Phenanthrene	0.24	1.5	0.41 U	0.4 U	0.27 J	0.16 J
Pyrene	0.67	2.6	0.41 U	0.4 U	0.76	0.43
Total Non-Carcinogenic PAHs	NE	NE	0	0.00	1.76	1.13
Total PAHs	4.02	44.8	0	0.00	3.12	2.15

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Constituent	New York Cleanup Obj. ERL	New York Cleanup Obj. ERM	RPSEDBG-E 0.00 RPSEDBG-E 10/09/2002	RPSEDBG-F 0.00 RPSEDBG-F 10/09/2002	RPSEDBG-G 0.00 RPSEDBG-G 10/09/2002	RPSEDBG-H 0.00 RPSEDBG-H 10/09/2002
Other Semivolatile Organic Compounds (ug/kg)						
1,2,4-Trichlorobenzene	NE	NE	410 U	400 U	420 U	400 U
1,2-Dichlorobenzene	NE	NE	410 U	400 U	420 U	400 U
1,3-Dichlorobenzene	NE	NE	410 U	400 U	420 U	400 U
1,4-Dichlorobenzene	NE	NE	410 U	400 U	420 U	400 U
2,4,5-Trichlorophenol	NE	NE	840 U	820 U	860 U	810 U
2,4,6-Trichlorophenol	NE	NE	410 U	400 U	420 U	400 U
2,4-Dichlorophenol	NE	NE	410 U	400 U	420 U	400 U
2,4-Dimethylphenol	NE	NE	410 U	400 U	420 U	400 U
2,4-Dinitrophenol	NE	NE	840 U	820 U	860 U	810 U
2,4-Dinitrotoluene	NE	NE	410 U	400 U	420 U	400 U
2,6-Dinitrotoluene	NE	NE	410 U	400 U	420 U	400 U
2-Chloronaphthalene	NE	NE	410 U	400 U	420 U	400 U
2-Chlorophenol	NE	NE	410 U	400 U	420 U	400 U
2-Methylphenol	NE	NE	410 U	400 U	420 U	400 U
2-Nitroaniline	NE	NE	840 U	820 U	860 U	810 U
2-Nitrophenol	NE	NE	410 U	400 U	420 U	400 U
3,3-Dichlorobenzidine	NE	NE	410 U	400 U	420 U	400 U
3-Nitroaniline	NE	NE	840 U	820 U	860 U	810 U
4,6-Dinitro-2-methylphenol	NE	NE	840 U	820 U	860 U	810 U
4-Chloro-3-methylphenol	NE	NE	410 U	400 U	420 U	400 U
4-Chloroaniline	NE	NE	410 U	400 U	420 U	400 U
4-Methylphenol	NE	NE	410 U	400 U	420 U	400 U
4-Nitroaniline	NE	NE	840 U	820 U	860 U	810 U
4-Nitrophenol	NE	NE	840 U	820 U	860 U	810 U
4-bromophenyl-phenylether	NE	NE	410 U	400 U	420 U	400 U
4-chlorophenyl-phenylether	NE	NE	410 U	400 U	420 U	400 U
Benzene, hydroxy-	NE	NE	410 U	400 U	420 U	400 U
Bis(2-chloro-1-methylethyl) ether	NE	NE	410 U	400 U	420 U	400 U
Bis(2-chloroethoxy)methane	NE	NE	410 U	400 U	420 U	400 U
Bis(2-chloroethyl)ether	NE	NE	410 U	400 U	420 U	400 U
Bis(2-ethylhexyl)phthalate	NE	NE	410 U	44 J	330 J	400 U
Butylbenzylphthalate	NE	NE	410 U	400 U	420 U	400 U
Carbazole	NE	NE	410 U	400 U	420 U	400 U
Di-n-butylphthalate	NE	NE	410 U	400 U	420 U	400 U
Di-n-octylphthalate	NE	NE	410 U	400 U	420 U	400 U
Dibenzofuran	NE	NE	410 U	400 U	420 U	400 U
Diethylphthalate	NE	NE	410 U	400 U	420 U	400 U
Dimethylphthalate	NE	NE	410 U	400 U	420 U	400 U
Hexachlorobenzene	NE	NE	410 U	400 U	420 U	400 U
Hexachlorobutadiene	NE	NE	410 U	400 U	420 U	400 U
Hexachlorocyclopentadiene	NE	NE	410 U	400 U	420 U	400 U
Hexachloroethane	NE	NE	410 U	400 U	420 U	400 U
Isophorone	NE	NE	410 U	400 U	420 U	400 U
N-Nitroso-di-n-propylamine	NE	NE	410 U	400 U	420 U	400 U
N-Nitrosodiphenylamine (1)	NE	NE	410 U	400 U	420 U	400 U
Nitrobenzene	NE	NE	410 U	400 U	420 U	400 U
Pentachlorophenol	NE	NE	840 U	820 U	860 U	810 U
Total Cyanide (mg/kg)						
Cyanide	NE	NE	0.16 U	0.18 U	0.20 U	0.17 U
Total Organic Carbon (%)						
TOC	NE	NE	0.1 U	0.6	1.3	0.5

Table 4-41 (continued)
Jamaica Bay Sediment Analytical Results
Rockaway Park Former MGP Site

Notes:

ERL - Effects Range Low
ERM - Effects Range Medium
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
J - estimated value
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
D - identifies all compounds in the analysis completed at secondary dilution factor
B - analyte was found within the laboratory method blank as well as the sample
N - spiked sample recovery was not within control limits (metals)
E - compound concentration exceeds the calibration range
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene.
PAHs are polycyclic aromatic hydrocarbons.

Table 4-42
Summary of Sediment PAH Concentrations
Rockaway Park Former MGP Site

Sample ID	Total PAHs (mg/kg)	Total Carcinogenic (mg/kg)	Total Non-Carcinogenic (mg/kg)
RPSEDBG-A	6.13	2.25	3.88
RPSEDBG-B	0.00	0	0.00
RPSEDBG-C	0.68	0.35	0.33
RPSEDBG-D	6.83	2.79	4.04
RPSEDBG-E	0	0	0
RPSEDBG-F	0.00	0	0.00
RPSEDBG-G	3.12	1.37	1.76
RPSEDBG-H	2.15	1.018	1.13
RPSED02-1 (0-0.3)	14.08	6.07	8.01
RPSED02-1 (0.3-3)	0	0	0
RPSED02-2 (0-0.3)	9.37	3.97	5.40
RPSED02-2 (0.3-3)	5.43	2.27	3.16
RPSED02-3 (0-0.3)	4.67	2.1	2.57
RPSED02-3 (0.3-3)	22.19	9.14	13.05
RPSED02-4 (0-0.3)	1.87	0.755	1.11
RPSED02-4 (0.3-3)	0.20	0.04	0.15
RPSED02-5 (0-0.3)	3.11	1.32	1.79
RPSED02-5 (0.3-3)	1.01	0.46	0.55
RPSED02-6 (0-0.3)	18.11	6.95	11.16
RPSED02-6 (0.3-1.9)	97	36.65	60.35
RPSED02-6 (1.9-2.4)	321.8	120.6	201.2
RPSED02-6 (2.4-4.4)	1.47	0.19	1.28
RPSED02-7 (0-0.3)	0.06	0	0.06
RPSED02-7 (0.3-3)	16.17	5.3	10.87
RPSED02-8 (0-0.3)	0.64	0.31	0.34
RPSED02-8 (0.3-3)	0.00	0	0.00
RPSED02-9 (0-0.3)	11.74	5.13	6.61
RPSED02-9 (0.3-3)	19.4	7.9	11.5
Average Background Samples:	1.83	0.79	1.04
Average Vibracore Samples:	27.42	10.46	16.96
Avg Vibracore Samples (excluding RPSED02-6):	6.87	2.80	4.07

Notes:
RPSED02-X (0.3-3.0) = Sediment vibracore sample collected in October 2002; depth beneath sediment interface (feet)
RPSEDBG-X = Background sediment sample collected at sediment interface with Shipeck sampler in October 2002

Table 4-43
Analytical Data Statistical Summary
Subsurface Soils
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections	Frequency of Detection Above NYS RSCOs
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	480	191	490	0	14.684	89
Toluene	1.5	476	211	2000	0	51.359	51
Ethyl benzene	5.5	473	278	2800	0	51.019	95
Xylene (total)	1.2	478	331	5900	0	85.758	112
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	20	1	0.004	0	0.004	0
2-Butanone	300	33	3	0.006	0	0.004	0
2-Hexanone	NE	33	1	0.001	0	0.001	0
Acetone	200	33	18	20	0	2.574	3
Benzene, 1,2,4-trimethyl	NE	43	31	796	0	80.258	0
Benzene, 1,3,5-trimethyl-	NE	20	12	75	0	16.152	0
Benzene, 1-methylethyl-	NE	20	7	13	0	4.396	0
Carbon disulfide	2700	33	4	0.016	0	0.006	0
Chlorobenzene	1700	33	0	0	0	0	0
Methylene chloride	100	33	14	37	0	2.709	4
n-Butylbenzene	NE	20	0	0	0	0	0
n-Propylbenzene	NE	20	5	6.8	0	3.230	0
sec-Butylbenzene	NE	20	1	1.7	0	1.700	0
Styrene	NE	52	20	1930	0	256.579	0
Tetrachloroethene	1400	33	5	0.008	0	0.003	0
Trichloroethene	700	33	1	0.001	0	0.001	0
Trichlorofluoromethane	NE	20	2	0.004	0	0.004	0
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	479	272	960	0	35.909	199
Benzo(a)pyrene	0.061	479	249	560	0	27.031	234
Benzo(b)fluoranthene	1.1	479	242	560	0	22.161	153
Benzo(k)fluoranthene	1.1	479	221	290	0	15.606	128
Chrysene	0.4	479	270	940	0	35.510	188
Dibenzo(a,h)anthracene	0.014	479	129	55	0	4.108	129
Indeno(1,2,3-cd)pyrene	3.2	479	204	250	0	12.525	95
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	479	228	5750	0	250.330	87
Acenaphthene	50	479	207	1800	0	63.645	57
Acenaphthylene	41	479	242	1590	0	47.032	35
Anthracene	50	479	261	1000	0	50.762	62
Benzo(g,h,i)perylene	50	479	208	230	0	13.812	12
Fluoranthene	50	479	301	1600	0	58.393	70
Fluorene	50	479	237	1800	0	71.109	65
Naphthalene	13	479	257	9600	0	377.600	109
Phenanthrene	50	479	324	5900	0	168.199	86
Pyrene	50	479	318	3100	0	92.433	84
Other Semivolatile Organic Compounds (ug/kg)							
2-Chloronaphthalene	NE	3	0	0	0	0	NE
1,2-Dichlorobenzene	7900	29	0	0	0	0	0
1-Methyl naphthalene	NE	24	23	3160	0	421.257	0
2,4-Dimethylphenol	NE	30	0	0	0	0	0
2,4-Dinitrotoluene	NE	30	0	0	0	0	0
2-Methylphenol	1000	30	1	0.038	0	0.038	0
4-Methylphenol	900	30	1	0.048	0	0.048	0
Benzene, hydroxy-	NE	185	2	23	0	11.520	2
Bis(2-ethylhexyl)phthalate	50000	30	3	0.52	0	0.347	0
Butylbenzylphthalate	50000	30	0	0	0	0	0
Carbazole	NE	29	5	9	0	3.538	0
Dibenzofuran	6200	428	135	327	0	15.389	56
Di-n-butylphthalate	8100	30	0	0	0	0	0
Di-n-octylphthalate	50000	30	0	0	0	0	0
N-Nitrosodiphenylamine (1)	NE	30	1	0.19	0	0.190	0
p-Cymene	NE	3	1	0.96	0	0.960	0

Table 4-43 (continued)
Analytical Data Statistical Summary
Subsurface Soils
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections	Frequency of Detection Above NYS RSCOs
Metals (mg/kg)							
Aluminum	NE*	19	19	1990	0	660.316	0
Antimony	NE*	20	9	0.61	0	0.327	0
Arsenic	7.5	289	250	41.5	0	2.800	25
Barium	300	290	289	269	0	14.640	0
Beryllium	0.16	20	0	0	0	0	0
Cadmium	1	291	115	6.9	0	0.612	19
Calcium	NE*	19	19	50200	0	6158.253	0
Chromium	10	290	290	29.9	0	4.101	21
Cobalt	30	19	17	7.2	0	1.683	0
Copper	25	19	19	40	0	11.212	3
Iron	2000	19	19	16800	0	4006.947	11
Lead	NE*	290	282	804	0	33.252	0
Magnesium	NE*	19	19	6990	0	714.416	0
Manganese	NE*	19	19	76.6	0	23.258	0
Mercury	0.1	291	60	2.8	0	0.312	28
Nickel	13	19	19	17.8	0	4.351	1
Potassium	NE*	19	19	261	0	138.605	0
Selenium	2	290	85	73	0	2.858	23
Silver	NE*	291	84	5.9	0	0.897	0
Sodium	NE*	19	11	776	0	181.555	0
Thallium	NE*	20	1	0.71	0	0.710	0
Vanadium	150	19	18	40.1	0	7.679	0
Zinc	20	19	19	251	0	39.289	10
Total Cyanide (mg/kg)							
Cyanide, total	NE	445	245	262	0	5.274	0
Polychlorinated Biphenyls (PCBs) (ug/kg)							
Aroclor 1242	1000	31	2	0.18	0	0.145	0
Aroclor 1254	1000	31	1	0.32	0	0.320	0
Aroclor 1260	1000	31	3	0.24	0	0.129	0
Pesticides (ug/kg)							
4,4'-DDD	2900	25	7	0.1	0	0.033	0
4,4'-DDE	2100	25	1	0.0088	0	0.009	0
4,4'-DDT	2100	25	9	0.5	0	0.127	0
Aldrin	41	25	4	0.041	0	0.016	0
alpha-BHC	110	25	4	0.032	0	0.010	0
alpha-Chlordane	NE	25	1	0.003	0	0.003	0
beta-BHC	200	25	3	0.007	0	0.004	0
delta-BHC	300	25	9	0.29	0	0.046	0
Dieldrin	44	25	5	0.37	0	0.093	2
Endosulfan I	900	25	5	0.036	0	0.010	0
Endosulfan II	900	25	6	0.062	0	0.018	0
Endosulfan sulfate	1000	25	7	0.082	0	0.038	0
Endrin	100	25	4	0.23	0	0.072	1
Endrin aldehyde	NE	25	1	0.013	0	0.013	0
Endrin ketone	NE	25	2	0.014	0	0.013	0
gamma-Chlordane	540	25	5	0.18	0	0.057	0
Heptachlor	100	25	4	0.049	0	0.021	0
Heptachlor epoxide	20	25	7	0.07	0	0.016	1
Lindane	NE	25	1	0.0059	0	0.006	0
Methoxychlor	NE	24	2	0.05	0	0.041	0
Toxaphene	NE	24	0		0		0
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	16	4	6400	0	2721.8	NE
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	16	2	90	0	78.5	NE
p-Cresol (TCLP)	NE	16	2	140	0	114	NE
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	16	6	6.5	0	5.0	NE
Barium (TCLP)	NE	16	16	894	9.5	114.1	NE
Cadmium (TCLP)	NE	16	2	4.6	0	3.45	NE
Chromium (TCLP)	NE	12	1	22	0	22	NE
Lead (TCLP)	NE	16	11	104	0	19.2	NE
Selenium (TCLP)	NE	16	9	8.2	0	6.0	NE
Silver (TCLP)	NE	16	1	3.2	0	3.2	NE
Total Phenols (mg/kg)							
Total Phenols	NE	4	0	0	0	0	NE

Table 4-43 (continued)
Analytical Data Statistical Summary
Surface Soils
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections	Frequency of Detection Above NYS RSCOs
Volatile Organic Compounds (VOCs)							
BTEX (mg/kg)							
Benzene	0.06	42	11	0.016	0	0.007	0
Toluene	1.5	42	10	0.028	0	0.011	0
Ethyl benzene	5.5	42	6	0.027	0	0.011	0
Xylene (total)	1.2	41	12	0.065	0	0.010	0
Other Volatile Organic Compounds (ug/kg)							
1,2,3-Trichlorobenzene	NE	1	0	0	0	0	NE
2-Butanone	300	17	0	0	0	0	0
2-Hexanone	NE	17	0	0	0	0	NE
Acetone	200	17	1	5	0	5	0
Benzene, 1,2,4-trimethyl	NE	1	1	25	0	25	NE
Benzene, 1,3,5-trimethyl-	NE	1	1	13	0	13	NE
Benzene, 1-methylethyl-	NE	1	1	1	0	1	NE
Carbon disulfide	2700	17	0	0	0	0	0
Chlorobenzene	1700	17	0	0	0	0	0
Methylene chloride	100	17	8	160	0	23.75	1
n-Butylbenzene	NE	1	0	0	0	0	NE
n-Propylbenzene	NE	1	0	0	0	0	NE
sec-Butylbenzene	NE	1	0	0	0	0	NE
Styrene	NE	17	0	0	0	0	NE
Tetrachloroethene	1400	17	1	8	0	8	0
Trichloroethene	700	17	1	1	0	1	0
Trichlorofluoromethane	NE	1	1	3	0	3	NE
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHs (mg/kg)							
Benzo(a)anthracene	0.224	50	48	79	0	11.1	28
Benzo(a)pyrene	0.061	50	49	66	0	8.3	30
Benzo(b)fluoranthene	1.1	50	49	71	0	11.8	25
Benzo(k)fluoranthene	1.1	50	49	35	0	5.7	23
Chrysene	0.4	50	49	100	0	13.6	27
Dibenzo(a,h)anthracene	0.014	50	31	13	0	2.0	21
Indeno(1,2,3-cd)pyrene	3.2	50	46	41	0	5.6	13
Non-Carcinogenic PAHs (mg/kg)							
2-Methylnaphthalene	36.4	50	36	42	0	4.2	1
Acenaphthene	50	50	13	3	0	0.849	0
Acenaphthylene	41	50	43	26	0	4.8	0
Anthracene	50	50	44	16	0	3.0	0
Benzo(g,h,i)perylene	50	50	46	38	0	6.0	0
Fluoranthene	50	50	50	130	0.11	15.5	4
Fluorene	50	50	24	8.6	0	1.9	0
Naphthalene	13	51	39	49	0	3.9	3
Phenanthrene	50	50	49	210	0	18.4	4
Pyrene	50	50	50	340	0.24	31.4	6
Other Semivolatile Organic Compounds (ug/kg)							
1,2-Dichlorobenzene	7900	17	0	0	0	0	0
1-Methyl naphthalene	NE	0	0	0	0	0	NE
2,4-Dimethylphenol	NE	17	0	0	0	0	NE
2,4-Dinitrotoluene	NE	17	2	700	0	560	NE
2-Methylphenol	1000	17	0	0	0	0	0
4-Methylphenol	900	17	0	0	0	0	0
Benzene, hydroxy-	NE	32	0	0	0	0	NE
Bis(2-ethylhexyl)phthalate	50000	17	4	410	0	242.5	0
Butylbenzylphthalate	50000	17	1	89	0	89	0
Carbazole	NE	11	0	0	0	0	NE
Dibenzofuran	6200	41	7	390	0	133.9	0
Di-n-butylphthalate	8100	17	1	55	0	55	0
Di-n-octylphthalate	50000	17	1	120	0	120	0
N-Nitrosodiphenylamine (1)	NE	17	0	0	0	0	NE
p-Cymene	NE	0	0	0	0	0	NE

Table 4-43 (continued)
Analytical Data Statistical Summary
Surface Soils
Rockaway Park Former MGP Site

Constituent	NYS Recommended Soil Cleanup Objectives	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections	Frequency of Detection Above NYS RSCOs
Metals (mg/kg)							
Aluminum	NE*	17	17	2940	0	1562.8	NE
Antimony	NE*	17	16	12.6	0	5.7	NE
Arsenic	7.5	50	49	29	0.61	7.2	14
Barium	300	50	50	581	5	56.2	0
Beryllium	0.16	17	16	0.44	0	0.208	19
Cadmium	1	50	49	5.8	0.17	0.799	20
Calcium	NE*	17	17	48000	0	5454.1	NE
Chromium	10	50	50	46.8	2.4	9.8	26
Cobalt	30	17	17	3.8	0	2.1	0
Copper	25	17	17	142	0	37.5	6
Iron	2000	17	17	27100	0	11479.4	10
Lead	NE*	50	49	785	9	186.6	NE
Magnesium	NE*	17	17	26400	0	2969.4	NE
Manganese	NE*	17	17	92	0	60.3	NE
Mercury	0.1	50	44	1.8	0.017	0.226	17
Nickel	13	17	17	9.5	0	6.4	0
Potassium	NE*	17	17	1090	0	338.7	NE
Selenium	2	50	31	7.5	0	1.3	3
Silver	NE*	50	37	6.6	0	1.2	NE
Sodium	NE*	17	16	249	0	145.6	NE
Thallium	NE*	17	16	1.12	0	0.843	NE
Vanadium	150	17	17	35.8	0	13.8	0
Zinc	20	17	17	95.7	0	50.3	8
Total Cyanide (mg/kg)							
Cyanide, total	NE	41	41	794	0.13	48.7	NE
PCBs (ug/kg)							
Aroclor 1242	1000	24	1	180	0	180	0
Aroclor 1254	1000	24	0	0	0	0	0
Aroclor 1260	1000	24	1	240	0	240	0
Pesticides (ug/kg)							
4,4'-DDD	2900	20	1	27	0	27	0
4,4'-DDE	2100	20	0	0	0	0	0
4,4'-DDT	2100	20	7	73	0	16.8	0
Aldrin	2900	20	2	1	0	0.92	0
alpha-BHC	110	20	2	4.2	0	3.6	0
alpha-Chlordane	5400	17	3	30	0	13.2	NE
beta-BHC	200	20	0	0	0	0	0
delta-BHC	300	20	0	0	0	0	0
Dieldrin	44	20	7	96	0	16.3	7
Endosulfan I	900	20	1	2	0	2	0
Endosulfan II	900	20	2	18	0	10.8	0
Endosulfan sulfate	1000	20	3	26	0	11	6
Endrin	100	20	1	8.9	0	8.9	0
Endrin aldehyde	NE	4	0	0	0	0	NE
Endrin ketone	NE	17	1	14	0	14	NE
gamma-Chlordane	540	17	2	12	0	6.7	7
Heptachlor	100	20	1	4	0	4	9
Heptachlor epoxide	20	20	1	4	0	4	7
Lindane	NE	20	0	0	0	0	NE
Methoxychlor	NE	20	2	50	0	27.75	NE
Toxaphene	NE	20	0	0	0	0	NE
TCLP							
TCLP Benzene (ug/l)							
Benzene (TCLP)	NE	0	0	0	0	0	NE
TCLP Semivolatile Organic Compounds (ug/l)							
o-Cresol (TCLP)	NE	0	0	0	0	0	NE
p-Cresol (TCLP)	NE	0	0	0	0	0	NE
TCLP Metals (ug/l)							
Arsenic (TCLP)	NE	0	0	0	0	0	NE
Barium (TCLP)	NE	0	0	0	0	0	NE
Cadmium (TCLP)	NE	0	0	0	0	0	NE
Chromium (TCLP)	NE	0	0	0	0	0	NE
Lead (TCLP)	NE	0	0	0	0	0	NE
Selenium (TCLP)	NE	0	0	0	0	0	NE
Silver (TCLP)	NE	0	0	0	0	0	NE

Table 4-43 (continued)
Analytical Data Statistical Summary
Groundwater
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections	Frequency of Detection Above NYS AWQS (GA)
Volatile Organic Compounds (VOCs)							
BTEX (ug/l)							
Benzene	1	219	98	61000	0	3215.7	90
Toluene	5	219	72	118000	0	4149.6	60
Ethylbenzene	5	219	112	9900	0	1008.9	88
Xylene (total)	5	219	114	41000	0	1565.6	87
Other Volatile Organic Compounds (ug/l)							
1,1,2-Trichloroethane	1	60	1	2	0	2	1
1,2,4-Trimethylbenzene	5	64	42	3950	0	287.9	35
1,2-Dichlorobenzene	3	61	1	1	0	1	0
1,3,5-Trimethylbenzene	5	58	34	500	0	61.2	29
2-Butanone	50*	61	3	18	0	9.33	0
Acetone	50*	60	11	84	0	31.3	2
Bromodichloromethane	50*	60	12	3	0	1.9	0
Carbon disulfide	NE	60	2	4	0	2.5	NE
Chloroform	7	61	15	29	0	17.7	13
Isopropylbenzene	5	58	26	90	0	21.2	16
Methyl tert-butyl ether	NE	58	4	170	0	53.75	NE
Methylene chloride	5	60	0	NA	0	NA	NA
Styrene	5	65	23	48100	0	3067.6	21
cis-1,2-Dichloroethene	5	59	1	2	0	2	0
n-Propylbenzene	5	58	10	24	0	9.9	7
sec-Butylbenzene	5	58	1	3	0	3	0
p-Cymene	NE	58	15	38	0	8	NE
Semivolatile Organic Compounds (SVOCs)							
Carcinogenic PAHS (ug/l)							
Benzo(a)anthracene	0.002*	219	25	1350	0	76.16	31
Benzo(a)pyrene	ND	219	16	790	0	79	NE
Benzo(b)fluoranthene	0.002*	219	19	460	0	40.3	19
Benzo(k)fluoranthene	0.002*	219	12	550	0	66.7	12
Chrysene	0.002*	219	22	1470	0	92.5	22
Dibenzo(a,h)anthracene	NE	218	6	130	0	30.2	NE
Indeno(1,2,3-cd)pyrene	0.002*	219	9	410	0	68.2	9
Non-Carcinogenic PAHS (ug/l)							
2-Methylnaphthalene	NE	219	92	17700	0	431.2	NE
Acenaphthene	20*	219	96	4690	0	139.3	53
Acenaphthylene	NE	219	68	6920	0	154.9	NE
Anthracene	50*	219	54	9860	0	203.6	6
Benzo(ghi)perylene	NE	219	9	600	0	93.2	NE
Fluoranthene	50*	219	51	1720	0	56.5	6
Fluorene	50*	219	83	4590	0	95.3	27
Naphthalene	10*	219	121	38900	0	2077.6	96
Phenanthrene	50*	219	98	7720	0	141.9	36
Pyrene	50*	219	68	4490	0	94.5	9
Other Semivolatile Organic Compounds (ug/l)							
1-Methyl naphthalene	NE	6	6	10700	70	2300	NE
2,4-Dimethylphenol	50*	59	9	120	0	26.8	2
2-Methylphenol	1	59	9	89	0	26.1	8
4-Methylphenol	1	59	7	47	0	15.9	6
Bis(2-ethylhexyl)phthalate	5	59	25	15	0	3.7	5
Carbazole	NE	60	2	4	0	2.5	NE
Di-n-butylphthalate	50	59	2	12	0	11	0
Dibenzofuran	NE	219	35	490	0	24.3	NE
Diethylphthalate	50*	59	2	2	0	1.5	0
Isophorone	50*	59	2	4	0	3	0
Phenol	1	59	11	34	0	12.9	10

Table 4-43 (continued)
Analytical Data Statistical Summary
Groundwater
Rockaway Park Former MGP Site

Constituent	NYS Ambient Groundwater Quality Standards (GA)	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections	Frequency of Exceedance of NYS AWQS (GA)
Metals (ug/l)							
Aluminum	NE	52	46	3590	0	416.9	NE
Antimony	3	53	5	7	0	4.5	5
Arsenic	25	54	24	16.2	0	7.7	0
Barium	1000	54	54	620	6.3	54.2	0
Bromide (mg/l)	2*	3	2	44.8	0	43.5	2
Cadmium	5	54	14	2.6	0	0.9	0
Calcium	NE	56	56	1650000	0.82	146075.0	NE
Chloride (mg/l)	250	56	56	19000	8	4052.6	24
Chromium	50	54	25	70.3	0	20.3	3
Cobalt	NE	54	43	8.4	0	2.1	NE
Copper	200	54	33	109	0	28.0	0
Iron (mg/l)	0.3	73	69	1.17	0	4.9	59
Ferrous Iron (mg/l)	NE	4	3	7000	0	2338.4	NE
Ferrous Iron (Dissolved) (mg/l)	NE	2	1	7000	0	7000	NE
Iron (Dissolved)	300	14	10	252	0	6612.5	5
Lead	25	54	39	117	0	16.9	5
Magnesium	35000*	54	54	658000	0.291	142410.0	19
Manganese (mg/l)	0.3	72	72	0.142	0.0023	0.2	25
Manganese (Dissolved)	300	16	16	139	20.6	186.4	5
Mercury	0.7	54	1	0.22	0	0.22	0
Nickel	100	54	43	23	0	5.3	0
Potassium	NE	56	56	792000	1860	118612.7	NE
Selenium	10	54	18	8.3	0	6.2	0
Silver	50	52	16	19.5	0	5.6	0
Sodium	20000	56	56	9080000	9550	1536763.2	41
Thallium	0.5*	54	8	15.6	0	6.7	8
Vanadium	NE	54	41	384	0	60.8	NE
Zinc	2000*	54	38	16.4	0	56.3	4
Natural Attenuation Parameters							
Alkalinity (mg/l)	NE	20	20	770	160	314.5	NE
Sulfate (mg/l)	250	20	18	2600	0	848.8	11
Hydrogen ion (pH)	NE	0	0	0	0	0	NE
Residue, filterable (mg/l)	NE	59	59	29000	130	6913.7	NE
Nitrate (mg/l)	10	17	3	0.55	0	0.33	0
Cyanide							
Cyanide (mg/l)	0.2	127	90	4.67	0	0.27	23
Cyanide (Dissolved) (ug/l)	NE	13	7	4.6	0	33.8	NE
Cyanide, Free (ug/l)	NE	54	21	182	0	20.2	NE
Cyanide, amenable to chlorination (mg/l)	NE	6	6	2.64	0.035	0.873	NE

Table 4-43 (continued)
Analytical Data Statistical Summary
Jamaica Bay Sediment
Rockaway Park Former MGP Site

Constituent	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections
Volatile Organic Compounds (VOCs)					
BTEX (mg/kg)					
Benzene	29	1	0.002	0	0.002
Toluene	29	1	0.002	0	0.002
Ethyl benzene	29	5	1.200	0	0.276
Xylene (total)	29	2	0.073	0	0.038
Other Volatile Organic Compounds (ug/kg)					
1,1,1-Trichloroethane	29	0		0	
1,1,2,2-Tetrachloroethane	29	0		0	
1,1,2-Trichloroethane	29	0		0	
1,1-Dichloroethane	29	0		0	
1,1-Dichloroethene	29	0		0	
1,2-Dichloroethane	29	0		0	
1,2-Dichloropropane	29	0		0	
2-Butanone	29	0		0	
2-Hexanone	29	0		0	
4-Methyl-2-pentanone	29	0		0	
Acetone	29	16	0.084	0	0.024
Bromodichloromethane	29	0		0	
Bromoform	29	0		0	
Bromomethane	29	0		0	
Carbon disulfide	29	9	0.008	0	0.003
Carbon tetrachloride	28	0		0	
Chlorobenzene	29	1	0.004	0	0.004
Chloroethane	29	0		0	
Chloroform	29	0		0	
Chloromethane	29	0		0	
Dibromochloromethane	29	0		0	
Methylene chloride	29	28	0.036	0	0.004
Styrene	29	0		0	
Tetrachloroethene	29	0		0	
Trichloroethene	29	0		0	
Vinyl chloride	29	0		0	
cis-1,2-Dichloroethene	29	0		0	
cis-1,3-Dichloropropene	29	0		0	
trans-1,2-Dichloroethene	29	0		0	
trans-1,3-Dichloropropene	29	0		0	
Semivolatile Organic Compounds (SVOCs)					
Carcinogenic PAHs (mg/kg)					
Benzo(a)anthracene	29	22	29.000	0	2.424
Benzo(a)pyrene	29	21	24.000	0	2.060
Benzo(b)fluoranthene	29	20	18.000	0	1.752
Benzo(k)fluoranthene	29	17	8.500	0	0.859
Chrysene	29	21	30.000	0	2.586
Dibenzo(a,h)anthracene	29	6	2.800	0	0.638
Indeno(1,2,3-cd)pyrene	29	16	8.300	0	1.004
Non-Carcinogenic PAHs (mg/kg)					
2-Methylnaphthalene	29	4	1.800	0	0.598
Acenaphthene	29	4	53.000	0	15.933
Acenaphthylene	29	19	11.000	0	0.996
Anthracene	29	17	13.000	0	1.270
Benzo(g,h,i)perylene	29	16	8.600	0	1.072
Fluoranthene	29	22	36.000	0	3.062
Fluorene	29	9	2.700	0	0.512
Naphthalene	29	6	7.100	0	1.560
Phenanthrene	29	20	14.000	0	1.454
Pyrene	29	23	54.000	0	5.047

Table 4-43 (continued)
Analytical Data Statistical Summary
Jamaica Bay Sediment
Rockaway Park Former MGP Site

Constituent	Number of Samples Analyzed	Number of Detections	Maximum Concentration of Analyzed Samples	Minimum Concentration of Analyzed Samples	Average Concentration of Detections
Other Semivolatile Organic Compounds (ug/kg)					
1,2,4-Trichlorobenzene	29	0		0	
1,2-Dichlorobenzene	29	0		0	
1,3-Dichlorobenzene	29	0		0	
1,4-Dichlorobenzene	29	0		0	
2,4,5-Trichlorophenol	29	0		0	
2,4,6-Trichlorophenol	29	0		0	
2,4-Dichlorophenol	29	0		0	
2,4-Dimethylphenol	29	0		0	
2,4-Dinitrophenol	29	0		0	
2,4-Dinitrotoluene	29	0		0	
2,6-Dinitrotoluene	29	0		0	
2-Chloronaphthalene	29	0		0	
2-Chlorophenol	29	0		0	
2-Methylphenol	29	0		0	
2-Nitroaniline	29	0		0	
2-Nitrophenol	29	0		0	
3,3-Dichlorobenzidine	29	0		0	
3-Nitroaniline	29	0		0	
4,6-Dinitro-2-methylphenol	29	0		0	
4-Chloro-3-methylphenol	29	0		0	
4-Chloroaniline	29	0		0	
4-Methylphenol	29	0		0	
4-Nitroaniline	29	0		0	
4-Nitrophenol	29	0		0	
4-bromophenyl-phenylether	29	0		0	
4-chlorophenyl-phenylether	29	0		0	
Benzene, hydroxy-	29	4	98.000	0	78.750
Bis(2-chloro-1-methylethyl) ether	29	0		0	
Bis(2-chloroethoxy)methane	29	0		0	
Bis(2-chloroethyl)ether	29	0		0	
Bis(2-ethylhexyl)phthalate	29	14	0.710	0	0.190
Butylbenzylphthalate	29	1	0.150	0	0.150
Carbazole	29	4	2.600	0	0.857
Di-n-butylphthalate	29	0		0	
Di-n-octylphthalate	29	6	1.200	0	0.453
Dibenzofuran	29	1	980.000	0	980.000
Diethylphthalate	29	0		0	
Dimethylphthalate	29	0		0	
Hexachlorobenzene	29	0		0	
Hexachlorobutadiene	29	0		0	
Hexachlorocyclopentadiene	29	0		0	
Hexachloroethane	29	0		0	
Isophorone	29	0		0	
N-Nitroso-di-n-propylamine	29	0		0	
N-Nitrosodiphenylamine (1)	29	0		0	
Nitrobenzene	29	0		0	
Pentachlorophenol	29	0		0	
Total Cyanide (mg/kg)					
Cyanide	25	1	0.350	0	0.350
Total Organic Carbon (%)					
TOC	28	27	18.000	0	1.822

* site background (Soils)/guidance value (Groundwater)
NE - not established
NA - not analyzed
ND - indicates standard is applicable to analyte detection limit
TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams/kilogram or parts per million (ppm)
ug/kg - micrograms/kilogram or parts per billion (ppb)
mg/L - milligrams/liter
ug/L - micrograms/liter or parts per billion (ppb)
BTEX is benzene, toluene, ethylbenzene, and xylene
PAHs are polycyclic aromatic hydrocarbons

Table 5-1
Soil Vapor and Ambient Air Analytical Results
Rockaway Park Former MGP Site

	Site ID/Depth (ft)/Sample ID/Date								
	RPSV-01	RPSV-02	RPSV-03	RPSV-04	RPSV-05	RPSV-06	RPSV-07	RPSV-08	RPSV-09
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RPSV-01	RPSV-02	RPSV-03	RPSV-04	RPSV-05	RPSV-06	RPSV-07	RPSV-08	RPSV-09
Constituent	02/08/2000	02/14/2000	02/16/2000	02/03/2000	02/03/2000	02/02/2000	01/28/2000	02/04/2000	01/24/2000
Volatile Organic Compounds (VOCs)									
BTEX (ppbv)									
Benzene	0.62 U	0.70 U	1.2 U	0.83	1.2	0.61 U	1.2 U	0.80 U	0.99
Toluene	1.2	4.3	470	2.3	3.3	190	440	1.6	2.4
Ethylbenzene	0.62 U	0.70 U	1.2 U	0.67 U	2.1	0.61 U	1.2 U	0.97	0.64 U
M/P-xylenes	0.62 U	1.6	1.2 U	1	6.6	0.68	1.2 U	3.6	1.9
o-Xylene	0.62 U	0.70 U	1.2 U	0.67 U	2.2	0.61 U	1.2 U	1.2	0.7
Total BTEX	1.2	5.9	470	4.13	15.4	190.68	440	7.37	5.99
Other Volatile Organic Compounds (VOCs) (ppbv)									
Naphthalene	12 U	14 U	25 U	13 U	13 U	12 U	24 U	16 U	13 U

Table 5-1
Soil Vapor and Ambient Air Analytical Results
Rockaway Park Former MGP Site

	Site ID/Depth (ft)/Sample ID/Date									
	RPSV-10	RPSV-11	RPSV-12	RPSV-13	RPSV-14	RPSV-15	RPSV-17	RPSV-18	RPSV-19	RPSV-20
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RPSV-10	RPSV-11	RPSV-12	RPSV-13	RPSV-14	RPSV-15	RPSV-17	RPSV-18	RPSV-19	RPSV-20
Constituent	02/23/2000	03/06/2000	03/03/2000	03/03/2000	02/25/2000	02/28/2000	02/29/2000	02/29/2000	03/02/2000	03/02/2000
Volatile Organic Compounds (VOCs)										
BTEX (ppbv)										
Benzene	0.70 U	0.64 U	1	0.66 U	0.66 U	0.66 U	0.64 U	0.71	17	140
Toluene	2	11	2.7	4.5	6.9	2.5	1.5	1.4	5.6	98
Ethylbenzene	0.70 U	0.64 U	0.65 U	0.66 U	0.66 U	0.66 U	0.64 U	0.65 U	0.92	69
M/P-xylenes	0.70 U	2.5	1.8	0.92	0.81	0.66 U	0.64 U	0.65 U	2.8	32
o-Xylene	0.70 U	0.64	0.65 U	0.66 U	0.66 U	0.66 U	0.64 U	0.65 U	0.75	3.8
Total BTEX	2	14.14	5.5	5.42	7.71	2.5	1.5	2.11	27.07	342.8
Other Volatile Organic Compounds (VOCs) (ppbv)										
Naphthalene	14 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	13 U	53 U

Table 5-1
Soil Vapor and Ambient Air Analytical Results
Rockaway Park Former MGP Site

	Site ID/Depth (ft)/Sample ID/Date								
	RPSV-21	RPSV-22	RPSV-23	RPSV-24	RPSV-25	RPAA-01	RPAA-02	RPAA-03	RPAA-04
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RPSV-21	RPSV-22	RPSV-23	RPSV-24	RPSV-25	RPAA-01	RPAA-02	RPAA-03	RPAA-04
Constituent	03/02/2000	11/21/2001	11/21/2001	11/21/2001	11/21/2001	01/04/2000	01/04/2000	01/04/2000	01/04/2000
Volatile Organic Compounds (VOCs)									
BTEX (ppbv)									
Benzene	220	3.3	1.6	4.2	13	0.94 U	1.1 U	1.1 U	0.82 U
Toluene	30	9.8	2.3	4.6	27	2.8	1.1 U	1.1 U	0.82 U
Ethylbenzene	13 U	2.4	0.62 U	1.2	3.3	0.94 U	1.1 U	1.1 U	0.82 U
M/P-xylenes	13 U	5.9	2.5	5.1	14	3.8	1.1 U	1.1 U	0.82 U
o-Xylene	13 U	4.2	1.1	3.1	9.2	1.3	1.1 U	1.1 U	0.82 U
Total BTEX	250	25.6	7.5	18.2	66.5	7.9	0	0	0
Other Volatile Organic Compounds (VOCs) (ppbv)									
Naphthalene	260 U	13 U	12 U	12 U	12 U	19 U	21 U	22 U	16 U

Notes:
NE - not established
U - indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
ppbv - parts per billion volume
BTEX is benzene, toluene, ethylbenzene, and xylene.

Table 6-1
Human Health Chemicals of Potential Concern

Medium	Chemicals of Potential Concern		
	Volatile Organic Chemicals	PAHs, Pesticides, and PCBs	Metals and Cyanide (total)
Surface Soil			
On-site (Site-wide)	benzene, ethylbenzene, toluene, xylene (total)	2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene, aroclor-1260	arsenic, barium, cadmium, chromium, cyanide (total), lead, mercury, selenium, silver
On-site (Gas Regulator Area)	ethylbenzene, xylene (total)	2-methylnaphthalene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene	arsenic, barium, cadmium, chromium, cyanide (total), lead, mercury, selenium, silver
Off-Site (non-residential areas)	benzene, ethylbenzene, toluene, xylenes (total)	2-methylnaphthalene, acenaphthylene, acenapthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene	arsenic, barium, cadmium, chromium, cyanide (total), lead, mercury, selenium, silver
Subsurface Soil			
On-site (Construction worker)	benzene, carbon disulfide, ethylbenzene, styrene, toluene, xylene (total)	2-methylnaphthalene, 2-methylphenol, 4-methylphenol, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, carbazole, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene, aldrin, aroclor-1242 aroclor-1254, aroclor-1260, alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, alpha chlordane, gamma chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, endrin aldehyde, endrin ketone, heptachlor, heptachlor epoxide, methoxychlor	aluminum, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, cyanide (total), lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, zinc

Table 6-1
Human Health Chemicals of Potential Concern

Medium	Chemicals of Potential Concern		
	Volatile Organic Chemicals	PAHs, Pesticides, and PCBs	Metals and Cyanide (total)
Subsurface Soil			
On-site (Gas Regulator Area)	ethylbenzene, toluene, xylene (total)	2-methylnaphthalene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene	arsenic, barium, cadmium, chromium, cyanide (total), lead, selenium, silver
Off-site (non-residential areas)	benzene, ethylbenzene, toluene, xylene (total)	2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene, dibenzofuran	arsenic, barium, chromium, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (total)
Groundwater			
On-site (Construction worker)	1,2,4,-trimethylbenzene, 1,3,5-trimethylbenzene, 2-butanone, 4-isopropyltoluene, acetone, benzene, ethylbenzene, isopropylbenzene, n-propylbenzene, styrene, toluene, xylene (total)	2,4-dimethylphenol, 2-methylnaphthalene, 2-methylphenol, 4-methylphenol, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, bis(2-ethylhexyl)phthalate, carbazole, chrysene, dibenzofuran, fluoranthene, fluorene, naphthalene, phenanthrene, phenol, pyrene	aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, cyanide (total), lead, manganese, nickel, selenium, silver, thallium, vanadium, zinc
On-site [1]	cumene, cis-1,2-dichloroethene, 1,2-dichlorobenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-isopropyltoluene, benzene, ethylbenzene, isopropylbenzene, MTBE, styrene, toluene, 1,1,2-trichloreothane, xylene (total)	2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(123-cd)pyrene, naphthalene, phenanthrene, pyrene, 1-methylnaphthylene, 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, carbazole, dibenzofuran, phenol	arsenic, barium, cadmium, chromium, lead, nickel, selenium, cyanide (total, dissolved, free)

[1] Assumes that an on-site well could be installed at any depth.

Table 6-2
Exposure Matrix for the Former Rockaway Park Manufactured Gas Plant

Media		Outdoor Air[1]		Indoor Air[1]	Surface Soil		Subsurface Soil		Groundwater			Surface Water[2]		Sediment[2]	
Potential Exposure		Vapor Inhalation	Particulate Inhalation	Accumulated Vapor Inhalation	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Inhalation of Vapors	Dermal Contact	Ingestion	Dermal Contact	Ingestion
Scenario	Receptor														
On-Site	Adult Commercial Workers/Adult and Child Visitors[3]	∅	∅	√	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
	Adult and Child Residents[3]	√	√	√	√	√	√[4]	√[4]	√[4]	∅	√[4]	∅	∅	∅	∅
	Adult Construction Worker[3]	√	√	∅	√	√	√	√	√	∅	√	∅	∅	∅	∅
	Adult KeySpan Worker	∅	√	∅	√	√	∅	∅	∅	∅	∅	∅	∅	∅	∅
	Adult Substation Worker	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
	Adolescent Trespasser	∅	√	∅	√	√	∅	∅	∅	∅	∅	∅	∅	∅	∅
Off-Site	Adult and Child Recreational Receptors	√[3]	√	∅	√	√	√[3]	√[3]	∅	∅	∅	∅	∅	∅	∅
	Adult Construction Worker[3]	√	√	∅	√	√	√	√	√	∅	√	∅	∅	∅	∅
	Adult Utility Worker	√	√	∅	√	√	√	√	√	∅	√	∅	∅	∅	∅

∅ Incomplete Pathway / Route
√ Potentially Complete Pathway / Route

[1] Inhalation of outdoor vapor and indoor air accumulation for current receptors are not considered complete as sampling results indicate concentrations below levels of concern (Table 5-1).
[2] Surface water and sediment are not considered complete exposure pathways as surface water is not used for recreational activities and sediment is 18 feet below surface.
[3] Future exposure scenario. All other scenarios listed are current exposure scenarios.
[4] Pathways are considered complete for adult resident only if resident engages in excavation activities.

Table 6-3
Rockaway Former MGP Site – Summary of Potential Exposures

Potentially Exposed Population	*Exposure Media*	*Exposure Potential*	*Pathway Complete?*	*Comments*
Current Scenarios			*As Is* [1]	
On-site trespassers	▪ Surface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate inhalation	Minimal	Yes	Access to site is restricted by gated fence.
	▪ Ambient air ▪ Vapor inhalation	None*	No	Available soil vapor data indicates that levels in ambient air would be below levels of concern.
On-site KeySpan workers	▪ Surface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate inhalation	Minimal	Yes	Visits to the site are of short duration and potential direct contact with surface soil is limited.
	▪ Subsurface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate/vapor inhalation	Minimal	Yes	Excavation work is not frequently performed. KeySpan maintains a policy that only trained workers are used for excavation work at active facilities, *i.e.*, a "no dig" policy is in effect at the site.
	▪ Groundwater ▪ Dermal contact ▪ Vapor inhalation	Minimal	Yes	
	▪ Indoor air ▪ Vapor inhalation	None*	No	Available indoor air data indicate that air concentrations are either non-detect or detected at levels below concern.

[1] Conditions as they currently exist.
* Based on currently available data.

Table 6-3 (continued)
Rockaway Park Former MGP Site – Summary of Potential Exposures

Potentially Exposed Population	*Exposure Media*	*Exposure Potential*	*Pathway Complete?*	*Comments*
Current Scenarios (continued)			*As Is* [1]	
Adult substation workers	This area was the subject of a previous quantitative analysis (refer to *Substation Investigation Report and Delisting Petition* report for details (D&B 2000)). Potential exposures outside of the substation area are limited to indoor air. Results of available data indicate that this exposure pathways is incomplete or not of concern.			
Adult nearby off-site utility worker	▪ Subsurface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate inhalation	Moderate to high	Yes	Exposure duration is limited.
	▪ Groundwater ▪ Dermal contact ▪ Vapor inhalation	Moderate to high	Yes	Groundwater beneath and in the vicinity of the site is well within the range of typical depths of construction and/or utility work.
Adult and child off-site recreationalists	▪ Surface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate inhalation	Moderate to high	Yes	Potential exposures are limited in duration. Future exposures to subsurface soil (as future surface soil) are complete due to erosion of the bulkhead.
	▪ Vapor inhalation	None*	No	Available soil vapor data indicates that levels in ambient air would be below levels of concern.
	▪ Surface Water ▪ Ingestion ▪ Dermal Contact	None	No	Surface water not used for recreational purposes.
	▪ Sediment ▪ Ingestion ▪ Dermal Contact	None	No	No potential pathway is considered complete for sediments at depths of 18 ft below the surface.

[1] Conditions as they currently exist.
* Based on currently available data.

Table 6-3 (continued)
Rockaway Park Former MGP Site – Summary of Potential Exposures

Potentially Exposed Population	*Exposure Media*	*Exposure Potential*	*Pathway Complete?*	*Comments*
Future Scenarios			*As Is* [1]	
On-site commercial workers/Adult and child visitors	▪ Indoor air ▪ Vapor inhalation	Minimal	No	Ambient air and soil vapor data indicate that air concentrations are either non-detect or detected at levels below concern.
On- and off-site construction workers	▪ Surface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate inhalation	Moderate to high	No	Elevated concentrations of site-related constituents exist on-site. Elevated cPAH concentrations were identified in some off-site samples; however, limited duration of construction projects suggests that this would not result in a significant incremental increase in exposure.
	▪ Subsurface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate/vapor inhalation	Moderate to high	No	
	▪ Groundwater ▪ Dermal contact ▪ Vapor inhalation	Moderate to high	No	Groundwater beneath and in the vicinity of the site is well within the range of typical depths of construction and/or utility work.

[1] Conditions as they currently exist.
* Based on currently available data.

Table 6-3 (continued)
Rockaway Park Former MGP Site – Summary of Potential Exposures

Potentially Exposed Population	*Exposure Media*	*Exposure Potential*	*Pathway Complete?*	*Comments*
Future Scenarios (continued)			*As Is* [1]	
Adult and child on-site residents	▪ Surface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate inhalation	Moderate to high	No	Exposure potential is moderate to high in the unlikely event that site is redeveloped as residential property. Subsurface soil exposures are for adults engaging in excavation activities on their property.
	▪ Subsurface soil ▪ Ingestion ▪ Dermal contact ▪ Particulate/vapor inhalation	Moderate	No	
	▪ Groundwater ▪ Dermal contact ▪ Ingestion ▪ Vapor inhalation	Minimal	No	Exposure potential is minimal due to salinity of groundwater (nonpotable water source). It is expected that future redevelopment plans would include connection to municipal water service. Groundwater pathway complete only if adult resident engages in excavation activities.
	▪ Indoor air ▪ Vapor inhalation	Minimal	No	Ambient air and soil vapor data indicate that air concentrations are either non-detect or detected at levels below concern. Future intrusion of volatile COPCs into indoor air cannot be considered incomplete based on this data.

[1] Conditions as they currently exist.
* Based on currently available data.

Table 6-4
Fish and Wildlife Resources Impact Analysis Decision Key

	Yes	No
1. Is the site or area of concern a discharge or spill event?		√
2. Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas?		√
3. Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?		√
4. Does the site contain habitat of an endangered, threatened, or special concern species?		√
5. Has the contamination gone off-site?	√	
6. Is there any discharge or erosion of contamination or the potential for discharge or erosion of contamination?	√	
7. Are the site contaminants PCBs, pesticides, or other persistent, bioaccumulable substances?		√
8. Does contamination exist at concentrations that could exceed SCGs or be toxic to aquatic life if discharged to surface water?	√	
9. Does the site or any adjacent or downgradient property contain any of the following resources?		
a. any endangered, threatened, or special concern species or rare plants or their habitats	√	
b. Any NYSDEC designated significant habitats or rare NYS ecological communities	√	
c. Tidal or freshwater wetlands	√	
d. Streams, creeks, or river		√
e. Pond, lake or lagoon		√
f. Drainage ditch or channel		√
g. Other surface water features		√
h. Other marine or freshwater habitats	√	√
i. Forest		√
j. Grassland or grassy field	√	
k. Parkland or woodland		√
l. Shrubby area		√
m. Urban wildlife habitat	√	
n. Other terrestrial habitat		√
10. Is the lack of resources due to contamination		√
11. Is the contamination a localized source which has not migrated from the source to impact any on-site or off-site resources?		√
12. Does the site have widespread soil contamination that is not confined under and around buildings or paved areas?		√
13. Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resources?	√	
14. Fish and wildlife resources impact analysis needed?	√	

Table 6-5
Plant Species Identified During Field Reconnaissance

Common Name	Scientific Name	Common Name	Scientific Name
Chicory	*Cichorium intybus*	Bristly foxtail	*Setaria faberii*
Tree-of-Heaven	*Ailanthus altissima*	Small white aster	*Aster vimineus*
Staghorn sumac	*Rhus typhina*	Gray goldenrod	*Solidago nemoralis*
Tartarian honeysuckle	*Lonicera tatarica*	Japanese knotweed	*Polygonella cuspidatum*
Honey locust	*Gleditsia triacanthos*	Yellow wood sorrel	*Oxalis europaea*
Beach grass	*Ammophila breviligulata*	Butter-n-eggs	*Linaria vulgaris*
Virginia creeper	*Parthenocissus quinquefolia*	Bitter nightshade	*Solanum dulcamara*
Bluegrass	*Poa pratensis*	Garlic mustard	*Allaria officinalis*
Dandelion	*Taraxacum officinale*	Late goldenrod	*Solidago gigantea*
English Plantain	*Plantago lanceolata*	Ragweed	*Ambrosia artemisiifolia*
Crab grass	*Digitaria sanguinalis*	Evening primrose	*Oenothera biennis*
Queen Anne's lace	*Daucus carota*	Common milkweed	*Asclepias syriaca*
Smartweed	*Polygonum persicaria*	Pokeweed	*Phytolacca americana*
Common mullein	*Verbascum thapsus*	Mugwort	*Artemisia vulgaris*

Table 6-6
Endangered and Threatened Species in the Vicinity of the Rockaway Park Site

Common Name	Scientific Name	NYS Legal Status	Last Seen	Location	Distance From Site
Cattle egret	*Bubulcus ibis*	Protected	1995	Ruffle Bar	1.6 miles
Glossy Ibis	*Plegadis falcinellus*	Protected	1998	Ruffle Bar	1.6 miles
Snowy egret	*Egretta thula*	Protected	1998	Ruffle Bar	1.6 miles
Great egret	*Ardea alba*	Protected	1998	Ruffle Bar	1.6 miles
Common tern	*Sterna hirundo*	Threatened	1988	East High Meadow, Subway Island	2.7 miles, 2.1 miles
Northern gamma grass	*Tripsacum dactyloides*	Threatened	1988	Dubois Point	2.5 miles
Retrorse flatsedge	*Cyperus retrorus*	Endangered	1902	Edgemere	3.5 miles
Narrow-leaf sea-blite	*Suaeda linearis*	Endangered	1997	Vernam Barbadoes Peninsula	1.5 miles
Roland's sea-blite	*Suaeda rolandii*	Endangered	1997	Vernam Barbadoes Peninsula	1.5 miles
Piping plover	*Charadrius melodus*	Endangered	1986	Arverne-By-The-Sea	2.08 miles
Black skimmer	*Rynchops niger*	Protected-Special Concern	1986	Subway Island	2.1 miles
Seabeach knotweed	*Polygonum glaucum*	Rare	1990	Jacob Riis Beach	3.2 miles
Willow oak	*Quercus phellos*	Endangered	1995	Vernam Barbadoes Peninsula	1.5 miles
Cut-leaved evening primrose	*Oenothera laciniata*	Endangered	1988	Vernam Barbadoes Peninsula	1.5 miles
Retrorse flatsedge	*Cyperus retrorus*	Endangered	1992	Jamaica Bay National Wildlife Refuge	1.4 miles
Barn Owl	*Tyto alba*	Protected	1984	Jamaica Bay National Wildlife Refuge	1.4 miles
Yellow flatsedge	*Cyperus flacescens var flavescens*	Endangered	1992	Jamaica Bay National Wildlife Refuge	1.4 miles

Source: Krahling, 2000

Table 6-7
Fish Species That May Be Present in Jamaica Bay

Common Name	Scientific Name
Sea lamprey	*Petromyzo marinus*
American eel	*Anguilla rostrata*
Alewife	*Alosa pseudoharengus*
American shad	*Alosa sapidissima*
Tidewater silverside	*Menidia beryllina*
Atlantic sturgeon	*Acipenser oxyrhynchus*
Striped bass	*Morone saxatilis*
Bluefish	*Pomatomus saltatrix*
Winter flounder	*Pleuronectes americanus*
Black sea bass	*Centropristis striata*
Atlantic silverside	*Menidia menidia*
Striped killifish	*Fundulus majalis*
Bay anchovy	*Anchoa mitchilli*
Mummichog	*Fundulus hereroclitus*
Atlantic menhaden	*Brevoortia tyrannus*
Scup	*Stenotomus chrysops*
Windowpane	*Scophthalmus aquosus*
Blackfish	*Tautaoga onitis*
Weakfish	*Cynoscion regalis*
Searobin	*Prionotus spp.*
Summer flounder	*Paralichthys dentatus*
Blueback herring	*Alosa aestivalis*

Source: USFWS, 1997.

Table 6-8
Herptile Species That May Be Present Based on Available Habitat

Common Name	Scientific Name	Habitat Requirements
Diamondbacked terrapin	*Maclemys terrapin*	Nest on sandy habitats with sparse o moderate vegetative cover. Known nesting areas are Dubos Point, Floyd Bennett Field and the community of Broad Channel.
Eastern spadefoot	*Scaphiopus holbrookii*	Sandy soils with temporary pools for breeding.
Eastern American toad	*Bufo americana*	Found in almost any habitat. Needs shallow water for breeding.
Fowler's toad	*Bufo woodhousii*	Prefers areas with sandy soil- shorelines, river valleys.
Northern spring peeper	*Hyla crucifer*	Second growth woodlots.
Gray treefrog	*Hyla versicolor*	Forested regions with small tees, shrubs and bushes near or in shallow water.
Green frog	*Rana clamitans*	Riparian, inhabiting margins of shallow permanent or semi-permanent water.
Spotted salamander	*Ambystoma maculatum*	Fossorial; found in moist woods, stream banks, beneath stones, logs, boards.
Redback salamander	*Plethodon cinereus*	Entirely terrestrial. Inhabits mixed deciduous woods, inhabiting interiors of decaying logs and stumps.
Common snapping turtle	*Chelydra serpentina*	Bottom dweller in any permanent body of fresh o brackish water.
Eastern painted turtle	*Chrysemys picta*	Quiet, shallow ponds and marshes. Sometimes in brackish tidal waters and salt marshes.
Eastern box turtle	*Terrapene carolina*	Woodlands, field edges, thickets, marshes, bogs, stream banks.
Northern water snake	*Nerodia sipedon*	Inhabits salt or fresh water. Common around spillways and bridges.
Northern brown snake	*Storeria dekayi*	Ubiquitous.
Smooth green snake	*Opheodrys vernalis*	Upland areas, grassy fields.
Northern black racer	*Coluber constrictor*	Moist or dry areas, forests and wooded area, fields, roadsides.
Eastern garter snake	*Thamnophis srtalis*	Ubiquitous.
Eastern hognose snake	*Heterodon platyrhinos*	Where sandy soils predominantly, such as beaches, open fields, dry open woods.
Eastern milk snake	*Lampropeltis triangulum*	Various habitats, usually with brushy or woody cover.

Source: Conat and Collins, 1975; DeGraaf and Rudis, 1983; USFWS, 1997

Table 6-9
Bird Species That May Be Present Based on Cover Types

Common Name	Scientific Name	Habitat Requirements	N or M
Common loon	*Gavia immer*	Winters in coastal bays and inlets.	M
Great blue heron	*Ardea herodias*	Shallow shores, coastal areas.	N
Green-backed heron	*Butorides striatus*	Makes use of nearly all fresh and salt water habitats.	N
Black-crowned night heron	*Nycticorax nycticorax*	Occupies fresh, brackish and salt water areas.	N
Bufflehead	*Bucephala albeola*	Winters in tidal creeks, coastal brackish areas.	M
Canada goose	*Branta canadensis*	Coastal salt marshes.	N
Green-winged teal	*Anas crecca*	Winters in tidal creeks, coastal brackish marshes, estuaries.	M
Black duck	*Anas rubripes*	Fresh, salt and brackish marshes and meadows.	N
Mallard duck	*Anas platyrynchos*	Prefers areas with water less than 16 inches deep.	N
Northern pintail	*Anas acuta*	Winters in brackish and salt water marshes.	M
Blue-winged teal	*Anas discors*	Winters in shallow coastal brackish and salt water marshes.	M
Northern shoveler	*Anas clypeata*	Winters in coastal bays and marshes, tidal flats.	M
Gadwall	*Anas stepera*	Winters in coastal bays and marshes.	N
American wigeon	*Anas amercana*	Winters in coastal marshes and bays.	M
Common goldeneye	*Bucephaia clanguia*	Winters in brackish or salt water estuarine bays.	M
Hooded merganser	*Lophodytes cucullatus*	Brackish marshes and coastal brackish bays.	N
Red-breasted merganser	*Mergus serrator*	Winters in mainly coastal water, bays, and inlets.	M
Brant	*Branta bernicla*	Winters mainly salt bays and estuaries.	M
Double-crested cormorant	*Phalacrocorax auritus*	Coastal areas.	N
Oldsquaw	*Clangula hyemalis*	Winters in coastal areas.	M
Canvasback	*Aythya valisneria*	Winters in coastal areas.	M
Lesser scaup	*Aythya affinis*	Winters in bays and estuaries.	M
Greater scaup	*Aythya marila*	Winters in bays and estuaries.	M
Ruddy duck	*Oxyura jamaicensis*	Winters in coastal areas,	M
Herring gull[a]	*Larus argentatus*	Coasts, bays, beaches	N
Greater black-backed gull	*Larus marinus*	Coastal waters, estuaries.	N
Laughing gull	*Larus atricilla*	Salt marshes, beaches, coastal bays.	N
American oystercatcher	*Haematopus palliatius*	Coastal beaches, tidal flats	N
Common tern	*Sterna hirundo*	Beaches, bays.	N

Table 6-9
Bird Species That May Be Present Based on Cover Types

Common Name	Scientific Name	Habitat Requirements	N or M
Great egret	*Casmerodiuos albus*	Mud flats.	N
Snowy egret	*Egretta thula*	Tidal flats.	N
Cattle egret	*Bubulcus ibis*	Marshes	N
Glossy ibis	*Plegadis falcinellus*	Fresh, brackish, and salt water. Favors shallow pools bordered by shrubs.	N
Killdeer	*Charadrius vociferus*	Fields, roadsides lawns.	N
Greater yellowlegs	*Tringa melanoleuca*	Winters in coastal mudflats.	M
Lesser yellowlegs	*Tringa flavipes*	Winters in coastal mudflats.	M
Ruddy turnstone	*Arenaria interpres*	Beaches, mud flats, jetties, rocky shores	M
Spotted sandpiper	*Actitis macularia*	Seashores.	N
Semi-palmated sandpiper	*Calidris pusilla*	Beaches, mud flats	M
Least sandpiper	*Calidris minutilla*	Grass marshes, mud flats, shores	M
Dunlin	*Calidris alpina*	Tidal flats, beaches, muddy pools	M
Sanderling	*Calidris alba*	Outer beaches, tidal flats	M
Short-billed dowitcher	*Limnodromus griseus*	Mud flats, tidal marshes	M
Red knot	*Calidris canutus*	Tidal flats, shores	M
Upland sandpiper	*Barramis longicauda*	Grassy fields, open meadows	N
Willet	*Catoptrophorus semipalmatus*	Marshes, wet meadows, mud flats	N
Osprey	*Pandion haliaetus*	Rivers, lakes, coast	N
Northern harrier	*Circus cyaneus*	Winters in coastal marshes.	M
American kestrel	*Falco sparverius*	Open areas, forest edges, cities.	N
American woodcock	*Scolopax minor*	Moist woodlands in early stages of succession.	N
King rail	*Rallus elegans*	Winters in coastal brackish water	M
Virginia rail	*Rallus limicola*	Winters in mainly tidal marshes.	M
Clapper rail	*Rallus longirostris*	Salt marshes.	N
Sora	*Porzana carolina*	Winters in tidal marshes.	M
Common moorhen	*Gallinula chloropus*	Reedy ponds	
Piping plover	*Charadrius melodus*	Sand beaches, tidal flats	N (?)
Black-bellied plover	*Pluvialis squatarola*	Mud flats, open marshes, beaches	N
Semi-palmated plover	*Charadrius semipalmatus*	Shores, tidal flats	N
Rock dove[a]	*Columbia livia*	Near human habitation.	N
Mourning dove[a]	*Zenaida macroura*	Suburbs, cities, open woodlands.	N
Eastern screech owl	*Otus asio*	Shade trees in suburbs.	N
Common nighthawk	*Chordeiles minor*	Cites, open areas.	N
Chiney swift	*Chaetura pelagica*	Buildings, cities.	N
Ruby-throated hummingbird	*Archilochus colubris*	Shade trees in residential landscapes.	N
Belted kingfisher	*Ceryle alcyon*	Near water containing fish.	N
Downy woodpecker	*Picoides pubescens*	Shade trees in towns and suburbs.	N

Table 6-9
Bird Species That May Be Present Based on Cover Types

Common Name	Scientific Name	Habitat Requirements	N or M
Hairy woodpecker	*Picoides villosus*	Open coniferous, deciduous and mixed woodlots	N
Northern flicker	*Colaptes auratus*	Suburbs, woodland edges.	N
Eastern wood peewee	*Contopus virens*	Roadsides, parks. Closely associated with oaks.	N
Eastern phoebe	*Sayornis phoebe*	Suburban areas.	N
Purple martin	*Progne subis*	Suburban areas near water.	N
Blue jay	*Cyanocitta cristata*	Suburbs, cities, parks and gardens.	N
American crow[a]	*Corvus brachyrhynchos*	Edges of woodlots, coastal areas.	N
Black-capped chickadee	*Parus atricapilus*	Residential areas, woodlands.	N
Tufted titmouse	*Parus bicolor*	Residential areas in shade trees.	N
White-breasted nuthatch	*Sitta carolinensis*	Shade trees in villages.	N
House wren	*Troglodytes aedon*	Near human dwellings.	N
American robin	*Turdus migratorius*	Shade trees in residential areas.	N
Gray catbird	*Dumetella carolinensis*	Shrubbery around buildings.	N
Mockingbird	*Mimus polyglottos*	Fruit-bearing shrubs in cities and towns.	N
Cedar waxing	*Bombycilla cedrorum*	Shade trees in residential areas.	N
Red-winged blackbird	*Agelaius phoeniceus*	Swamps and marshes.	N
Boat-tailed grackle	*Quiscalus major*	Salt water along coasts.	N
Common grackle	*Quiscalus quiscula*	Suburbs.	N
Northern oriole	*Icterus galbula*	Shade trees in residential areas.	N
Purple finch	*Carpodacus purpureus*	Residential areas.	N
House finch	*Carpodacus mexicanus*	Suburban and urban yards.	N
American goldfinch	*Cardeulis tristis*	Suburban gardens, shade trees.	N
Starling[a]	*Sturnus vulgaris*	Cities, gardens, parks.	N
Yellow-rumped warbler	*Dendroica coronata*	Winters along the coast.	M
Yellow warbler[a]	*Dendroica petechia*	Farmlands and roadsides.	N
American redstart	*Mniotilta varia*	Shade trees near dwellings.	N
Common yellowthroat	*Geothlypis trichas*	Fresh or salt water marshes.	N
Northern cardinal	*Cardinalis cardinalis*	Suburban gardens.	N
Rose-breasted grosbeak	*Pheucticus ludovicianus*	Shade trees in suburban areas.	N
House sparrow[a]	*Passer domesticus*	Cities, parks.	N
Chipping sparrow	*Spizella paserina*	Suburban residential areas.	N
Field sparrow	*Spizella pusilla*	Briar thickets, old fields.	N
Song sparrow	*Melospiza melodia*	Suburbs, cities.	N
Sharp-tailed sparrow	*Ammospiza caudacutus*	Coastal marshes.	N
Seaside sparrow	*Ammodramus maritimus*	Salt marshes.	N
Brown-headed cowbird	*Molothrus ater*	Open coniferous and deciduous woodlands.	N
Eastern towhee	*Pipilo erythrophthalmus*	Woodland edges.	N
Brown thrasher	*Toxostoma rufum*	Woodland edges. Often in cities.	N

Table 6-9
Bird Species That May Be Present Based on Cover Types

Common Name	Scientific Name	Habitat Requirements	N or M
Veery	*Catharus fuscescens*	Low moist deciduous woods.	N
Blue-gray gnatcatcher	*Polioptila caerulea*	Open moist woodlands.	N
Marsh wren	*Cistothorus palustris*	Fresh and brackish marshes.	N
Carolina wren	*Thryothorus ludovicianus*	A variety of places from lowland stream bank tangles to upland brushy slopes.	N
Barn swallow	*Hirundo rustica*	Man-made structures for nesting.	N
Northern rough-winged swallow	*Stelgidopteryx serripennis*	Nearly any open area with nest sites.	N
Tree swallow	*Tachycineta bicolor*	Farmlands, river bottomlands.	N
Fish crow	*Corvus ossifragus*	Low coastal areas.	N
Red-eyed vireo	*Vireo olivaceus*	Open deciduous and second-growth woodlands.	N
White-eyed vireo	*Vireo griseus*	Dense shrubby lowlands.	N
Eastern kingbird	*Tyrannus tyrannus*	Shrubby borders, forest edges.	N
Great-crested flycatcher	*Myiarchus crinitus*	Forest edges.	N
Willow flycatcher	*Empidonax traillii*	Open, newly clear cut areas.	N
Acadian flycatcher	*Empidonax virescens*	Deciduous woodlands.	N
Black-billed cuckoo	*Coccyzus erythropthalmis*	Shrubby hedgerows.	N
Northern bobwhite	*Colinus virginianus*	Open fields of grass.	N
Ring-necked pheasant	*Phasianus colchicus*	Meadows with abundant weedy growth.	N

Source: DeGraaf and Rudis, 1983; USFWS, 1997; NYSDEC, 2000.

[a]Species observed during field reconnaissance.

N = Nesting
M = Migrant

Table 6-10
Mammals That May Be Present Based on Cover Types

Common Name	Scientific Name	Habitat Requirements
Virginia opossum	*Didlphis virginiana*	Near human habitation.
Least shrew	*Cryptosis parva*	Salt marshes, woodland edges.
Northern shot-tailed shrew	*Blarina brevicauda*	Both timbered and fairly open habitats
Eastern moles	*Scalopus aquaticus*	Lawns, sandy soils.
Star-nosed moles	*Condylura cristata*	Prefers low wet ground.
Little brown myotis	*Myotis lucifugus*	Dark warm sites for maternity colonies.
Big brown bat	*Eptesicus fuscus*	Buildings, bridges, tunnels.
Silver-haired bat	*Lasionycteris noctivagans*	Forested areas near lakes and streams.
Red bat	*Lasiurus borealis*	Wooded areas near water.
Hoary bat	*Lasiurus cinereus*	Forest edge.
Eastern cottontail	*Sylvilagus floridanus*	Suburban areas wit adequate food and cover.
Eastern chipmunk	*Tamias striatus*	Tree or shrub cover with elevated perches.
Woodchuck	*Marmota monax*	Edges of woodlands, open cultivated land, meadows, open brushy hillsides.
Gray squirrel	*Sciurus carolinensis*	Suburban parks, shade trees especially oaks.
Deer mouse	*Peromyscus maniculatus*	Near out-buildings in shrubs.
White-footed mouse	*Peromyscus leucopus*	Edges of woodlands.
Muskrat	*Ondatra zibethicus*	Wetlands with dense emergent vegetation.
Meadow vole	*Microtus pennsylvanicus*	Freshwater and salt water marshes.
Norway rat	*Rattus morevegicus*	Buildings, dumps, cities.
House mouse	*Mus musculus*	Buildings.
Red fox	*Vulpes vulpes*	Found in a variety of habitats. A mixture of forest and open areas is preferred.
Raccoon	*Procyon lotor*	Found in wetlands near human habitation.
Striped skunk	*Mephitis mephitis*	Suburban areas.

Source: Burt and Grossenheider, 1976; DeGraaf and Rudis, 1983; USFWS, 1997

Table 6-11
Comparison of Rockaway Park Surface Soil Data to Toxicological Benchmark Values

Parameter	Toxicological Benchmark			On-site Surface Soil *		Off-site Surface Soil *	
	Earth Worms	Terrestrial Plants	Meadow Vole	Frequency of Detection	Range of Detected Concentrations	Frequency of Detection	Range of Detected Concentrations
Volatile Organic Compounds							
2-Butanone			26,173	1/8	0.003	NA	
Acetone			148	4/9	0.005-0.02	NA	
Benzene			211	15/30	0.001-36	2/11	0.001-0.002
Ethylbenzene			**2003**	16/30	0.002-94	4/11	0.001-0.003
Methylene chloride			86.5	3/8	0.022-0.16	NA	
Styrene			**7231**	2/8	0.002-0.002	NA	
Tetrachloroethene			11.2	4/8	0.001-0.008	NA	
Toluene		200	208	15/30	0.006-460	3/11	0.005-0.016
Trichloroethene			5.598	1/8	0.001	NA	
Xylene (total)			2.5	17/30	0.003-1200	7/11	0.001-0.014
Semivolatile Organic Compounds							
2-Methylnaphthalene			**18**	24/30	0.037-2100	9/11	0.094-0.93
4-Methylphenol			**74**	1/7	0.048	NA	
Acenaphthene		20	**1395**	11/30	0.16-880	7/11	0.034-0.38
Acenaphthylene			**1395**	28/30	0.097-390	9/11	0.85-7.2
Anthracene			**7971**	29/30	0.093-620	10/11	0.039-2.8
Benzo(a)anthracene			**8**	30/30	0.29-600	10/11	0.26-8.6
Benzo(a)pyrene			8	30/30	0.24-340	10/11	0.25-3.7
Benzo(b)fluoranthene			**996**	30/30	0.26-410	10/11	0.33-8.2
Benzo(g,h,i)perylene			**598**	27/30	0.22-190	10/11	0.24-6.6
Benzo(k)fluoranthene			**996**	29/30	0.13-180	10/11	0.15-2.8
Bis(2-ethylhexyl)phthalate			146	1/7	0.26	NA	
Carbazole			**88**	3/7	0.069-4.6	NA	
Chrysene			**8**	30/30	0.25-620	10/11	0.29-7.6
Dibenzo(a,h)anthracene			**8**	22/30	0.054-44	9/11	0.13-1.7
Dibenzofuran			**8**	12/30	0.061-110	5/11	0.055-0.22
Fluoranthene			**11049**	30/30	0.45-1200	8/11	0.25-15
Fluorene	30		**996**	21/30	0.14-950	6/11	0.15-4.7
Indeno(1,2,3-cd)pyrene			**996**	28/30	0.19-190	10/11	0.23-6.1
Naphthalene			**996**	26/30	0.083-9600	9/11	0.14-1.4
Phenanthrene			**1473**	30/30	0.26-4200	11/11	0.15-17
Pyrene			**20**	30/30	0.52-2300	11/11	0.31-23

Table 6-11
Comparison of Rockaway Park Surface Soil Data to Toxicological Benchmark Values

Parameter	Toxicological Benchmark			On-site Surface Soil *		Off-site Surface Soil *	
	Earth Worms	Terrestrial Plants	Meadow Vole	Frequency of Detection	Range of Detected Concentrations	Frequency of Detection	Range of Detected Concentrations
Inorganic Compounds							
Aluminum	50		15.433	7/7	415-1990	NA	
Antimony		5	1	3/7	0.27-0.61	NA	
Arsenic	60	10	1.008	29/29	0.61-40	11/11	0.61-12.2
Barium		500	79.6	29/29	6.8-261	11/11	5-52.9
Cadmium	20	4	14.255	26/29	0.22-6.9	11/11	0.044-0.51
Chromium	0.4	1	40449	13/29	3.5-27.8	11/11	2.4-11.2
Cobalt		20	**88**	7/7	0.81-3.3	NA	
Copper	50	100	224.8	7/7	4.7-26.3	NA	
Cyanide, total			945.2	29/29	0.072-138	11/11	0.16-21.3
Lead	500	50	118.23	29/29	5.4-706	11/11	16.5-289
Manganese		500	1301	7/7	10-76.6	NA	
Mercury	0.1	0.3	19.21	26/29	0.017-1.8	11/11	0.017-0.3
Nickel	200	30	591.15	7/7	3.1-10	NA	
Selenium	70	1	2.956	13/29	0.54-73	1/11	0.52-0.52
Silver		2	**14.7**	24/29	0.34-6.6	2/11	0.092-0.29
Vanadium		2	2.881	7/7	3.3-32.1	NA	
Zinc	200	50	2364.6	7/7	7-251	NA	

Notes:

* Surface soil includes soils collected to a depth of 4 feet below ground surface

Bolded values are derived benchmarks. See Tables 3-3 and 3-4.

NA = parameter was not analyzed for

Table 6-12
Parameters for Calculation of Toxicological Benchmarks

Organism	Body Weight (kg)	Food Intake (kg/day)	Food Factor *f*
Mouse	0.03	0.0055	0.18
Rat	0.35	0.028	0.08
Dog	12.7	0.301	0.024
Rabbit	3.8	0.135	0.034
Meadow vole	0.044	0.005	0.114

Source: Oak Ridge National Laboratory, Sample et al. 1996.

Table 6-13
Derivation of Toxicological Benchmarks for Meadow Vole

Chemical	Test Organism	Endpoint	$NOAEL_t$ (mg/kg/day)	Reference for Test Species	NOAEL for Meadow Vole (mg/kg/day)	Toxicological Benchmark for Meadow Vole (mg/kg)
Ethylbenzene	Rat	NOAEL	136	IRIS	228.4	2003
Styrene	Dog	NOAEL	200	IRIS	824.4	7231
2-Methylnaphthalene	Rat	LD50 (1630 mg/kg)	1.20	NTP	2.0	18
4-Methylphenol	Rat	NOAEL	5.00	HEAST	8.4	74
Acenaphthene	Mouse	NOAEL	175	IRIS	159.0	1395
Acenaphthylene[a]	Mouse	NOAEL	175	HEAST	159.0	1395
Anthracene	Mouse	NOAEL	1000	IRIS	908.7	7971
Benzo(a)anthracene[c]	Mouse	NOAEL	1	ORNL	0.9	7.97
Benzo(b)fluoranthene[b]	Mouse	NOAEL	125	IRIS	113.6	996
Benzo(g,h,i)perylene[d]	Mouse	NOAEL	75	IRIS	68.2	598
Benzo(k)fluoranthene[b]	Mouse	NOAEL	125	IRIS	113.6	996
Carbazole	Rat	LDLo (500 mg/kg)	6.00	NTP	10.1	88.39
Chrysene[c]	Mouse	NOAEL	1	ORNL	0.9	7.97
Dibenzo(a,h)anthracene[c]	Mouse	NOAEL	1	ORNL	0.9	7.97
Dibenzofuran[c]	Mouse	NOAEL	1	ORNL	0.9	7.97
Dimethylphthalate[f]	Rat	NOAEL	750	IRIS	1259.5	11049
Fluoranthene	Mouse	NOAEL	125	IRIS	113.6	996
Fluorene	Mouse	NOAEL	125	IRIS	113.6	996
Indeno(1,2,3-cd)pyrene[b]	Mouse	NOAEL	125	IRIS	113.6	996
Naphthalene	Rat	NOAEL	100	IRIS	167.9	1473
Phenanthrene	Mouse	LD50 (700 mg/kg)	2.6	NTP	2.3	20
Pyrene	Mouse	NOAEL	75	IRIS	68.2	598
Cobalt	Rat	LDLo (750 mg/kg)	6.00	NTP	10.1	88
Silver[e]	Rat	NOAEL	1	ORNL	1.7	14.7

To convert mg diet/kg body weight, divide the diet component by the food factor times the uncertainty factor

Sources:

IRIS: USEPA, 2000:

HEAST: USEPA, 1997.

NTP: National Toxicology Program's Chemical Health and Safety Data Website: http://ntp-server.niehs.nih.gov/Main_Pages/Chem-HS.html

ORNL; Oak Ridge National Laboratory, Sample et al. 1996.

a Value for acenaphthene
b Value for fluoranthene u
c Value for benzo(a)pyrene used
d Value for pyrene used
e Value for cadmium used
f Value for diethylphthalate used

Table 6-14
Comparison of Sediment Results to ER-M and ER-L Values

Sediment Depth	Sample Number	Less than ER-L (%)	Between ER-L and ER-M (%)	Greater than ER-M (%)	Mean (ppm or mg/kg)
0.0 – 0.3 feet bgs	9	44	56	0	7.1
0.3 – 3 feet[1] bgs	11	45	37	18	40.4
Site Background	8	75	25	0	2.4
Regional Background[2]		60	37	3	7.7

1. Includes data from RPSED02-6 (1.9 – 2.0 ft) and RPSED02-6 (2.4-4.4 ft).

2. From, *Sediment Quality of the NY/NJ Harbor System, An Investigation under the Regional Environmental Monitoring and Assessment Program* (EPA 1998).

Table 6-15
Fish Species of Jamaica Bay Potentially Exposed to Site-Related PAHs
Rockaway Park MGP Site
Rockaway, New York

Common Name	Scientific Name	Habitat	Diet	Reproduction	Foraging/Home Range and Migration
Sea lamprey	*Petromyzo marinus*	water column (1); small lampreys are generally bottom dwellers while larger ones are usually found along the edge of the shelf and over the continental slope (2)	blood and body fluids from a variety of fish, sharks, and marine mammals (1)	anadromous (1)	
American eel	*Anguilla rostrata*	generally seek muddy bottom and still water, but can be found wherever food is abundant in estuaries or freshwater (1)	predators and scavengers, will feed on any available animal matter (1)	spend 5-20 years in fresh or coastal waters; adults migrate far off-shore to breed and do not return; majority of metamorphosis is completed off-shore; young elvers return to coastal waters or freshwater (1)	may remain within 60-140 meters in a stream; may migrate far into freshwater (1); relatively small home range, rarely move more than 100m from point of release (3)
Alewife	*Alosa pseudoharengus*	usually caught in coastal waters 50-110 m deep, but are also caught in shallower coastal waters; usually stay deeper during the day because they are light sensitive (1)	planktivore; eats a variety of zooplankton; at sea, also eat small fish, fish eggs, and larvae; larger fish in freshwater may consume some benthic invertebrates (amphipods) (1)	anadromous (1)	spends majority of life at sea; spawns in freshwater; seasonal migration - move inshore and northward in spring and move offshore and southward in fall (1)
American shad	*Alosa sapidissima*	at sea, they are usually found at the surface to 220 m deep; may be found in shallow coastal waters spring, summer, early fall; move offshore in late fall and winter (1)	in ocean: zooplankton, copepods, mysid shrimps, ostracods, amphipods, isopods, euphausiids, larval barnacles, fish eggs, occasional small fish (1); in rivers, young feed mostly in water column; at sea, food may include benthic organisms (3)	anadromous (1)	spends majority of life at sea; spawns in freshwater; make daily vertical migrations following zooplankton; northward, inshore coastal migration each spring (1)
Inland (or Tidewater) silverside	*Menidia beryllina*	wide salinity tolerance; prefer lower salinities; found in estuaries over variety of bottom types; usually found in upper portion of estuaries; may enter tidal creeks and rivers (1)	omnivorous; diet includes copepods, mysids, isopods, amphipods, barnacle nauplii, ostracods, mollusks, worms, larval fishes, fish eggs, insects, other zooplankton, some algae, small amounts of detritus (1)	summer spawn in shallow water in intertidal zone of upper estuaries (1)	year-round resident; little data to support offshore winter migration; limited home range (1)
Atlantic sturgeon	*Acipenser oxyrhynchus*	tend to stay close to shore (<20m deep) (1); adults may show preference for areas with little or no current (4)	opportunistic benthic feeders; diet includes polychaetes, isopods, decapod crustaceans, amphipods, gastropods, bivalves, fish; polychaetes was the majority of diet for sturgeons off of New Jersey (1)	anadromous (1)	interestuarine movements have been observed; may also migrate seasonally north and south (1); some juveniles have been observed traveling large distances (1450 km) (4)
Striped bass	*Morone saxatilis*	tend to be offshore and closer to the bottom by day and onshore in the water column at night; found in a variety of habitats in enclosed bays, marsh estuaries, river mouths, and along open coasts; may follow schools of fish (1)	fish and invertebrates (proportions depend on size of bass and on prey availability) (1)	anadromous; spawn in either brackish waters at heads of estuaries or in freshwater rivers (1)	some populations may be highly migratory; others may stay within a water body and its river systems (1,5)

Table 6-15
Fish Species of Jamaica Bay Potentially Exposed to Site-Related PAHs
Rockaway Park MGP Site
Rockaway, New York

Common Name	Scientific Name	Habitat	Diet	Reproduction	Foraging/Home Range and Migration
Bluefish	*Pomatomus saltatrix*	juveniles prefer bays, sounds, and estuaries; adults prefer open water (6)	primarily schooling species of fish and squid; may also eat shrimp, crabs, and annelid worms (1,6)	summer pelagic spawning 50 to 150 km offshore (6)	migratory; warmer months in New England to Cape Hatteras, NC; winter in Florida and Gulf Stream (6)
Winter flounder	*Pleuronectes americanus*	demersal; adults prefer muddy or vegetated bottom (2); may also occur over sandy, clay, or gravelly bottoms (1)	benthic invertebrates (primarily amphipods and polychaetes) (7); diet may include shrimp, small crabs, other crustaceans, squids, mollusks, and occassionally, small fish (1)	spawn in nearshore or estuarine waters in winter to early spring (2)	generally found inshore in winter and offshore in warmer months; may remain inshore year-round depending on temperature and food availability (7); relatively large home ranges (several hundred to several thousand km^2) (8)
Black sea bass	*Centropristis striata*	demersal; prefer structured habitats (reefs, shellfish beds, rocky bottoms); often found near wharf pilings, shipwrecks, and other man-made structures (1,9); may move to open bottom habitats to feed and then return to sheltered habitats (9)	omnivorous; primarily consume crustaceans, fishes, mollusks, worms (1)	spawning times vary by location; spawn in June to October off new Jersey and Long Island; spawn in inner shelf waters (18-45 m deep) (1)	migrate south and off-shore for the winter; migrate north and inshore for the warmer months (1,9)
Atlantic silverside	*Menidia menidia*	inhabit intertidal creeks, marshes, and shore zones of estuarine embayments in spring, summer, and fall; form schools over sand, gravel, mud, or peat bottoms; may also be found in stands of sedge grass and eelgrass at high tide (1)	feed on copepods, barnacle nauplii, horseshoe crab larvae, mysids, shrimps, small decapods, amphipods, cladocera, fish eggs, young squid, annelid worms, moluscan larvae, insects, algae, and diatoms (1)	during the spawning season, move from lower estuaries to intertidal zone of upper estuaries to spawn at high tide (1)	migrate off-shore in winter (1); common feeding areas for adults and juveniles include, gravel and sand bars, open beaches, tidal creeks, river mouths, and flooded zones of marsh vegetation; atlantic silversides generally found more seaward than inland silversides (10)
Striped killifish	*Fundulus majalis*	variety of shallow water habitats (open beaches, coves, bays, marsh creeks, subtidal shorelines); prefer sandy bottoms (1); tend to aggregate near shore in estuarine salt marshes or well-vegetated areas in freshwater (11)	omnivorous; feed on plankton, small fish, vegetation, carrion, amphipods, and other small crustaceans; feed throughout the water column (11,12)	spawn from May through July in New Jersey; spawn on the bottom in shallow near-shore waters and intertidal pools (1)	may spend summer in shallower habits and winter in deeper (1-3 m) areas (1)
Bay anchovy	*Anchoa mitchilli*	most plentiful in shallow, estuarine tidal waters with muddy bottoms and brackish water; also found in river mouths, along sandy beaches, and in intertidal creeks; usually found in water no deeper than 25 m; found in clear and turbid water over all types of substrates (muddy coves, grassy areas, surf zones, oyster bars, sandy beaches, sand and silt bottoms) (1)	opportunistic, primarily feed on zooplankton (copepods mainly), larger fish may feed on macrozooplankton (mysids, larval fishes and crab, isopods, and other invertebrates including some benthic organisms) (1)	all life stages are pelagic; in Long Island Sound, spawning occurs in water depths less than 20 m; in the Mid-Atlantic, generally spawn in estuaries (13); spawning generally occurs from May to September in northern areas (1)	no known north-south seasonal migration; migrage seasonally inshore-offshore; found inshore only in the summer in Northern parts of range (1)

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Rockaway, New York

Common Name	Scientific Name	Habitat	Diet	Reproduction	Foraging/Home Range and Migration
Mummichog	*Fundulus hereroclitus*	salt marsh flats, estuaries, tidal areas, especially vegetated areas; may also be found in freshwater (11)	opportunistic; feed on small crustaceans, annelids, gastropods; smallest fish feed mainly on copepods and annelid worms, larger fish feed on *Spartina* detritus and other food particles (1); feed throughout the water column (surface, mid-water, bottom) (14)	spawn in fresh, brackish and saltwater (14)	"among the most sedentary of fishes, especially during the summer", may move greater distances in winter; summer home range may be up to 15 hectares, spring migration from high-salinity waters into brackish and freshwaters has been reported; may leave marsh creeks to overwinter in pools on marsh surface; movements within marshes follow tides (1); no breeding migrations; in summer, fish over 60 mm long often have a home range of 36-38 m along a tidal creek bank, but the home range may be up to 375 m (14)
Atlantic menhaden	*Brevoortia tyrannus*	found in estuaries (and tributaries), bays, and coastal waters (1)	filter-feeder; mainly feed on phytoplankton (diatoms) but also copepods, mysid shrimps, euphausiids, and annelid worms, and organic detritus (1)	generally spawn at sea over continental shelf; eggs are buoyant (3)	north-south seasonal migrations (north and inshore in summer, south and offshore in winter); adults winter off Virginia and the Carolinas; on a local scale, adults frequently move in and out of bays and inlets depending on tides, season and weather (1)
Scup	*Stenotomus chrysops*	in summer, stay within 10 km from shore in water 2-36 m deep; move offshore in fall; generally found in water 2 to 180 m deep; young may be found in shallower water (1 m deep); may prefer smooth bottom to rocky; very sensitive to cold temperatures (1); demersal; may be found in variety of habitats (open, sandy bottoms or structured habitats) (15)	generally benthic feeders (15); feed on cnidarians, squids, polychaetes, crustaceans, fish (1)	spawn once a year close to shore; eggs are buoyant (1)	migrate south and off-shore to NJ and NC in winter, migrate north and inshore to NJ, NY, and southern New England in spring and remain until fall (1)

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Fish Species of Jamaica Bay Potentially Exposed to Site-Related PAHs
Rockaway Park MGP Site
Rockaway, New York

Common Name	Scientific Name	Habitat	Diet	Reproduction	Foraging/Home Range and Migration
Windowpane	*Scophthalmus aquosus*	shoal-water fish; most often found at depths less than 55m; from southen New England and southward, generally caught on sandy bottoms; wide temperature tolerance (1)	feed predominantly on mysids, fishes, and decapods, but may also eat chaetognaths, squids, mollusks, asidians, polychaetes, cumaceans, isopods, amphipods, euphausiids, and salps; a study in Long Island sound found that mysids were the predominant food item and fishes were not major food items; forage on actively swimming prey; may feed exclusively on nektonic organisms (1)	peak spawning occurs May to October (1); generally spawn near bottom; in the Mid-Atlantic Bight, may spawn in high salinity areas of estuaries (16)	year-round residents inshore from Cape Cod to Cape Hatteras; young settle in shallow inshore water and move into deeper offshore waters as they grow; some adults may travel along the coast (1)
Blackfish	*Tautaoga onitis*	demersal; juveniles prefer vegetated habitats; adults need sheltered habitats (rocky shores, breakwaters, shipwrecks, piers, docks, jetties, shellfish beds) at night when inactive; stay at feeding areas (shellfish beds) during day, tend to return to same sheltered area at night (1)	opportunistic; feed predominantly on mussels and other mollusks; may also consume crustaceans and small fish occassionally (1)	spawn in coastal and midshelf waters beginning in April in southern part of Mid-Atlantic Bight and progresses northward; peak spawning from Cheasapeake Bay to Nantucket Shoals is June and July; spawning may occur both inshore and offshore (1)	migrate off-shore in winter; in northern areas, can be found inshore from late May to November (1)
Weakfish	*Cynoscion regalis*	often found near water surface; occur along sandy shores, larger bays, estuaries, salt-marsh creeks; do not enter freshwater; form schools (1)	predominantly feed on small fishes; may also consume crabs, amphipods, shrimps, squids, mollusks, annelid worms; diet depends on size of weakfish and on food availability (1)	in New Jersey and Long Island, spawning begins in May and June; spawn near bottom in inets, bays, sounds, or near the mouths of estuaries (1)	migrate northward and inshore for the summer and southward and offshore for the winter (1)
Sea robin (northern)	*Prionotus spp. (Prionotus carolinus)*	demersal; found from tide line to edge of continental shelf; occur at an average depth of 78 m in spring and 31 m in fall; active swimmers but rest on bottom or bury themselves (1); prefer sandy bottoms (3)	predominantly eat decapod crustaceans, polychaetes and fishes; may also eat bivalves, cumaceans, isopods, mysids, amphipods, annelids, gastropods, pelecypods, and copepods (juveniles only) (1)	ripe females collected in New York Bight from May to September; spawn from Block Island, RI to Cape Hatteras, NC from May to November; eggs found in southern NJ in inlets and nearshore habitats (1)	in New York Bight, seasonal onshore to offshore migration: June - September, fish are less than 28m deep; May and October to November, scattered over shelf; January to April, deeper than 28m (1)
Summer flounder	*Paralichthys dentatus*	demersal; generally prefer sandy bottoms; found near dock pilings and bridges (1)	predominantly piscivorous (both bottom fish and surface species); also eat cephalopods; smaller flounder may eat crustaceans (1)	spawn offshore from September to February (17)	migrate offshore in winter; migrate inshore to shalow coastal waters and estuaries in warmer months; may return to same bay each year (18)

Table 6-15
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Rockaway Park MGP Site
Rockaway, New York

Common Name	Scientific Name	Habitat	Diet	Reproduction	Foraging/Home Range and Migration
Blueback herring	*Alosa aestivalis*	spend majority of life at sea, return to shore and freshwater to spawn; frequently caught at depths of 27-55 m (1)	feed on plankton; mainly ctenophores, copepods, amphipods, mysids and other pelagic shrimps, small fishes while at sea; juveniles feed mainly below the surface on copepods and cladocerans; only small amounts of benthic inverts are eaten; feeding is mostly in the water column (1)	anadromous (1)	daily vertical migrations following planktonic food supply; seasonal migrations: summer and fall, confined to shelf areas north of 40^{o}N (e.g., Nantucket Shoals, Georges Bank, Gulf of Maine); in spring, distributed over continental shelf from Nova Scotia to Cape Hatteras while returning to spawning rivers (1)

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