SUPPLEMENTAL PHASE II ENVIRONMENTAL SITE ASSESSMENT INVESTIGATION REPORT

PREPARED FOR

51-17 ROCKAWAY BEACH BOULEVARD
FAR ROCKAWAY, QUEENS, NEW YORK 11691

CEQR #18DCP124Q

PREPARED BY

FPM group
An Olgoonik Company

909 MARCONI AVENUE
RONKONKOMA, NY 11779

FEBRUARY 2019

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

EXECUTIVE SUMMARY

FPM Group (FPM) has completed a Supplemental Phase II Environmental Site Assessment (ESA) Investigation for 51-17 Rockaway Beach Boulevard, Far Rockaway, Queens County, New York (Property), identified on the Queens Borough tax map as Block 15857 and Lot 1. This property is further identified as City Environmental Quality Review (CEQR) #18DCP124Q. The Property is owned by Peninsula Rockaway Housing Fund Development Corp. and is proposed to be redeveloped.

The Property was originally a marsh with an elevation near sea level. The Property was modified by placement of historic fill and initially developed between 1912 and 1933 with a wagon shed and a cold storage facility for the Borden Farm Products Company. By 1951 the Property used by the Hogan Paint and Chemical Company. Between 1981 and 2006 the buildings were used for unspecified warehouse/industrial purposes. The above-grade portions of the buildings were demolished between 2009 and 2010 and the Property has since been used for equipment parking/storage.

This investigation was conducted following a work plan developed in accordance with the procedures outlined in the CEQR Technical Manual (March 2014 edition) and conditionally approved by the New York City Department of Environmental Protection (DEP) on October 29, 2018. FPM previously conducted a Phase II Investigation of this property; the results of this earlier Phase II investigation are evaluated together with the data obtained during the Supplemental Phase II Investigation to assess subsurface conditions and the nature and extent of contamination.

Soil Conditions

- Historic fill consisting of sand containing angular gravel, slag, brick, concrete, and/or asphalt is present to an approximate depth of 3 feet beneath nearly the entire property. These materials are typical of historic fill in the greater New York metro area and this fill was likely placed to facilitate development of the property in the early 1900s;

- Soil impacted by chlorinated solvents and some petroleum volatile and semivolatile organic compounds (VOCs and SVOCs) is present in the B3 drywell area. The impacts exceed the unrestricted use and protection of groundwater Soil Cleanup Objectives (SCOs), with some of the SVOC detections also exceeding the restricted residential and/or commercial use SCOs. The impacts were generally noted in the interval to about 4 feet below grade, with some exceedances also noted in the 4 to 6-foot interval at B3N and B3E. This impacted area appears to be a source for groundwater VOC impacts noted at GW-15 and GW-16 and for soil vapor impacts;

- Soil impacted primarily by petroleum-related VOCs and SVOCs is present in the B9/B9N/CB-4 drywell area. The impacts appear to coincide with paint/petroleum odors in the interval from 2 to 8 feet below grade in the borings. This impacted area appears to be a source for VOC impacts to groundwater and soil vapor. No impacts were identified in the samples from the B9A, B9E, B9S, or B9W borings, which indicates that the source area is limited;

- Some petroleum-related VOC and SVOC impacts were noted in the shallow interval of boring B16. These results are consistent with the odor and organic vapor readings and indicate that an apparently limited amount of petroleum impact is present in soil the vicinity of this boring. The petroleum-related VOC impacts have not affected groundwater quality at the nearby GW-16 well;

- Some limited impacts were noted in other soil borings. These impacts are not associated with visual indications of potential contamination and do not appear to be indicative of significant contamination; and

- Catch basins (CB-1, CB-2, CB-3, CB-4 and CB-5) and drywells (B3, B4, and B9) all exhibited exceedances of SCOs for SVOCs, metals, pesticides, and/or PCBs typical of urban stormwater runoff, with CB-4 and B4 also showing indications of petroleum-related VOCs and trichloroethene (TCE). These catch basins and drywells may also be sources for VOC impacts to groundwater and soil vapor.

Groundwater Conditions

- Groundwater flow is to the north-northeast, consistent with the distribution of VOC contaminants in groundwater;

- A plume of petroleum-related VOCs and chlorinated solvents is present in groundwater at GW-7, GW-10, GW-13, and GW-2, with lesser impacts noted at GW-1 and GW-8. These impacts appear to originate from source materials in the B9/B9N/CB-4 area. As the plume migrates, TCE is breaking down into daughter products. Chlorinated solvents were not found at levels exceeding New York State Department of Environmental Conservation (NYSDEC) Standards at sampling locations located crossgradient from the centerline of the plume, upgradient of the plume, or downgradient of the plume, indicating that the plume of VOC-impacted groundwater is narrow, well-defined, and limited to the Property;

- A smaller plume chloroform-impacted groundwater is present downgradient of the B3 drywell area where several VOCs, including TCE and breakdown products, were found in soil. The breakdown of TCE to chloroform in the groundwater a short distance downgradient of the apparent source area suggests that this area of groundwater impact is limited;

- SVOCs and several metals (totals) were found in nearly all of the groundwater samples. These detections likely resulted from high turbidity in the groundwater samples are not representative of actual groundwater conditions at the Property. Results from samples that were filtered to remove turbidity generally do not show elevated levels of any metals other than sodium, which was found in most of the samples, consistent with the Property's location in proximity to the Atlantic Ocean. Iron, which is often found at elevated levels in Long Island groundwater, was found above its Standard in one well and does not present a concern; and

- Pesticides and PCBs did not exceed the NYSDEC Standards in any of the groundwater samples.

Soil Vapor Conditions

- Five VOCs for which the New York State Department of Health (NYSDOH) provides guidance were detected in at least one of the soil vapor samples and may pose a concern for soil vapor intrusion (SVI). Specifically, the results at several locations could trigger a monitor or mitigate response, and the levels of TCE at four locations would trigger a mitigate response. All of these VOCs were detected in the source material at the B9/B9N/CB-4 and B3 areas and/or in the groundwater beneath the Property and the soil vapor detections likely originated from these onsite sources; and

- Elevated concentrations of several petroleum compounds were detected at SV-7. These detections also appear related to the impacted soil noted in the nearby B9/B9N/CB-4 area.

Remedial Measures

It is proposed to redevelop the Property, together with other parcels, with mixed commercial and restricted residential uses. The preliminary redevelopment plan shows that the Property is to be completely covered by a new residential building and associated covered parking and pavement. No vegetated areas are proposed, with the exception of a stormwater management planter to be located to the north of the building.

Redevelopment activities will include removal of the existing former building infrastructure (walls, pavement, drywells, etc.) from the Property. Excavation is anticipated to be conducted to 4 feet below grade to accommodate grade beams for the new slab-on-grade building. No basement or other subsurface infrastructure is proposed, other than building foundation elements. Public water will be provided to the Property and no use of the Property groundwater is contemplated.

Based on the nature and extent of contamination at the Property and the anticipated redevelopment, a Remedial Action Plan (RAP) should be prepared. The RAP should include an evaluation of potential exposures under the contemplated redevelopment scenario and remedial measures to address the identified contamination and potential exposures.

SECTION 1.0
INTRODUCTION AND PURPOSE

This Supplemental Phase II Environmental Site Assessment (ESA) Investigation Report has been prepared by FPM Group, Ltd. (FPM) for the property located at 51-17 Rockaway Beach Boulevard, Far Rockaway, Queens County, New York (Property), identified on the Queens Borough tax map as Block 15857 and Lot 1. This property is further identified as City Environmental Quality Review (CEQR) #18DCP124Q. This Report describes the procedures and results of the Supplemental Phase II ESA Investigation that was conducted to further evaluate the nature and extent of contamination associated with the Property. This investigation was conducted following a work plan that was developed in accordance with the procedures outlined in the CEQR Technical Manual (March 2014 edition) and conditionally approved by the New York City Department of Environmental Protection (DEP) on October 29, 2018 (copy in Appendix A).

FPM previously conducted a Phase II Investigation of this property, the procedures and results of which were documented in a March 28, 2018 report. The results of this earlier Phase II investigation are evaluated together with the data obtained during the Supplemental Phase II Investigation documented herein. Copies of pertinent portions of this older report are included in Appendix A for reference.

1.1 Property Location and Description

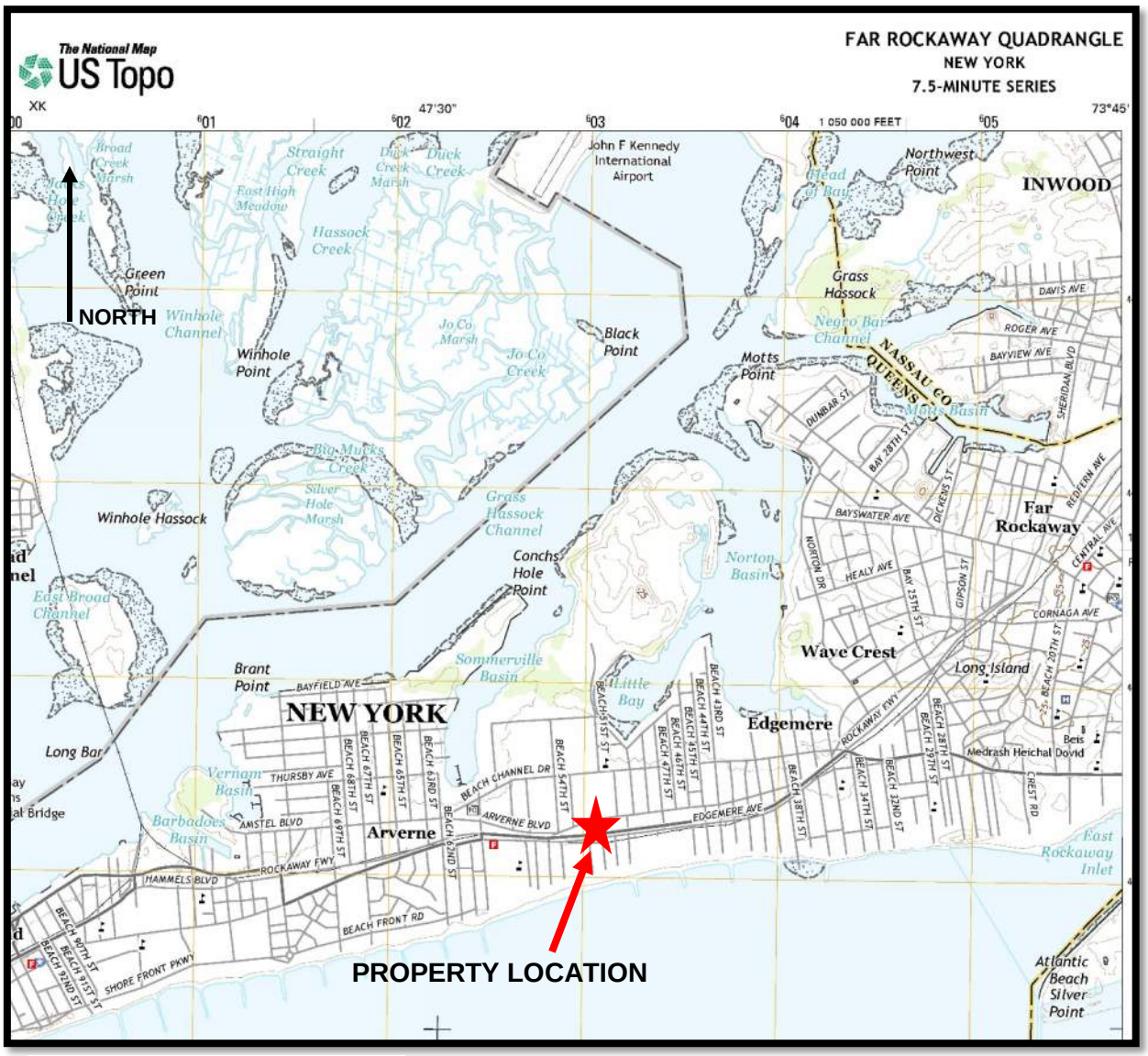
The Property is located in Far Rockaway, Queens County, New York and occupies approximately 17,775 square feet on the southeast corner of the intersection of Rockaway Beach Boulevard and Beach 52nd Street. The general location of the Property is presented in Figure 1.1.1. The Property is owned by Peninsula Rockaway Housing Fund Development Corp. and is proposed to be redeveloped, together with other parcels, with mixed commercial and restricted residential uses.

The surface topography of the Property vicinity was obtained from the USGS Far Rockaway, New York Quadrangle (2016), a portion of which is shown in Figure 1.1.1. The topographic elevation in the Property vicinity generally ranges from approximately 5 to 10 feet above mean sea level (MSL) and the ground surface is relatively flat.

The current surface elevations of the Property were obtained from a November 20, 2015 topographic survey by Rogers Surveying, PLLC, a portion of which is shown on Figure 1.1.2. This survey shows that the Property surface generally ranges from 4 to 6 feet above MSL and slopes gently to the southeast. The Property includes the remnants of a former 13,000-square-foot commercial building and associated paved areas, as shown on the survey. Some overgrown vegetation is present, which partially obscures the visibility of the former features.

1.2 Property Environmental Setting

The Property has been modified from its original configuration (former marsh with an elevation near sea level) by placement of historic fill and subsequent building and pavement construction. The historic fill was found to consist primarily of sand with variable amounts of gravel, slag, brick, and concrete fragments.



Source: US Geological Survey, 2016

SCALE: ONE MILE

FPM GROUP

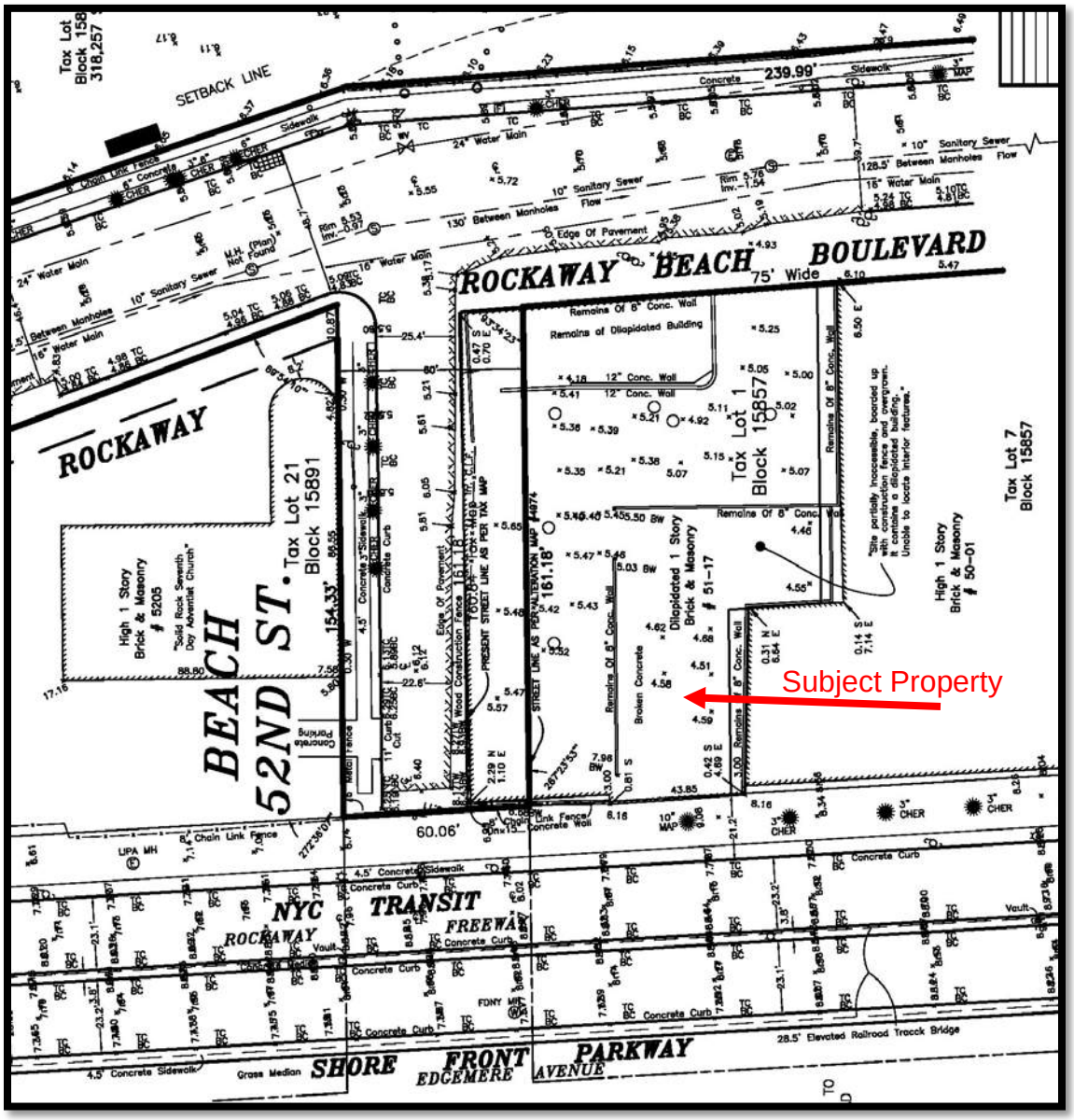
FIGURE 1.1.1

PROPERTY LOCATION

51-17 ROCKAWAY BEACH BOULEVARD
FAR ROCKAWAY, QUEENS, NEW YORK

Drawn by: SOD	Checked By: BC	Date: 8/23/2018

\\lisa11\Clients\PeninsulaRockaway-Arker\Far Rockaway\E Site\DEP Phase II\Fig111-topo.docx



Source: Rogers Surveying, PLLC, August 22, 2018

APPROX. SCALE: 50 FEET

NORTH

FPM GROUP

FIGURE 1.1.2

PROPERTY SURVEY

51-17 ROCKAWAY BEACH BOULEVARD
FAR ROCKAWAY, QUEENS, NEW YORK

Drawn by: SOD	Checked By: BC	Date: 8/28/2018

\\lisa11\Clients\PeninsulaRockaway-Arker\Far Rockaway\E Site\DEP Phase II\Fig112-survey.docx

Beneath the historic fill, the Property is underlain successively by sand with organic marsh deposits in places, and by Upper Glacial Formation sand, silt, and clay outwash deposits (USGS, 1963). The Gardiners Clay, consisting of clay with interbedded silt and sand, is present below the Upper Glacial Formation. The top of the Gardiners Clay is present at an approximate elevation of between -50 and -100 feet MSL in the Property vicinity and acts as an aquitard between the Upper Glacial Formation and the deeper Magothy Formation.

The depth to groundwater beneath the Property was estimated at approximately 4 feet, based on information obtained during the previous Phase II investigation performed at the Property. Additional depth to groundwater information was obtained during the Supplemental investigation, as discussed in Section 4.2. The regional groundwater flow direction in the property vicinity (USGS, 2009) was anticipated to be generally to the north. The Property-specific groundwater flow direction was confirmed during the Supplemental investigation, as discussed in Section 4.2.

There are no surface water bodies on or adjoining the Property. The closest surface water bodies are the Atlantic Ocean at Rockaway Beach (about 0.25 miles south), Conch Bay of Little Bay (about 0.3 miles northeast), and Sommerville Basin (about 0.4 miles west). These areas are separated from the Property by one or more multi-lane streets and/or the MTA Subway A Line.

As noted in the Supplemental investigation work plan, no public water or other supply wells were identified within one-half mile of the Property. As documented by the US Geological Survey (USGS, 1963), very little (if any) fresh groundwater is anticipated to be present in the Upper Glacial or Magothy Aquifers in the Property vicinity due to the Property's location close to the Atlantic Ocean and Jamaica Bay. Based on the urban nature of the surrounding area, the availability of public water via the New York City water supply system, and the saline nature of the groundwater in the underlying Upper Glacial and Magothy Aquifers, water supply wells are unlikely to have been installed in the Property vicinity.

1.3 Property History

Based on available historic records (Sanborn Fire Insurance maps, discussed in the January 2018 Phase I ESA Report), the Property was developed between 1912 and 1933 with a wagon shed and a cold storage facility for the Borden Farm Products Company. By 1951 the Property used by the Hogan Paint and Chemical Company. Between 1981 and 2006 the buildings were used for unspecified warehouse/industrial purposes. The above-grade portions of the buildings were demolished between 2009 and 2010 and the Property has been used for equipment parking/storage thereafter.

1.4 Adjacent Property Usage

The Property is bounded to the north by Rockaway Beach Boulevard, as shown on Figure 1.1.2. The property across Rockaway Beach Boulevard to the north is presently vacant and was most recently occupied by a former hospital building. This property is to be redeveloped with mixed restricted residential and commercial uses. The Property is bounded to the west by Beach 52nd Street. Further to the west are a church and an electrical substation. The Property is bounded to the east by commercial buildings. The MTA Subway A Line and the Rockaway Freeway bound the Property to the south. Vacant lots are present further to the south.

SECTION 2.0
SUMMARY OF PREVIOUS INVESTIGATIONS

The Property was investigated in 2018 during a Phase I Environmental Site Assessment (ESA) and a Phase II investigation, the results of which were summarized in the Supplemental investigation work plan. A brief summary of these investigations is provided below in support of the evaluation of the Supplemental investigation results.

Environmental data from the Property are evaluated relative to applicable New York State standards, criteria, and guidance (SCGs). The applicable SCGs include the 6NYCRR Part 375-6 Soil Cleanup Objectives (SCOs) for soil, the 6 NYCRR Part 703.5 Class GA Ambient Water Quality Standards (Standards) for groundwater, and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006, and May 2017 updated matrices). In particular, the soil data are compared to the SCOs for the planned use of the property.

Redevelopment of the property is planned and is anticipated to include restricted residential and commercial uses. Redevelopment is discussed below in Section 2.3.

2.1 2018 Phase I Environmental Site Assessment

The Property was initially investigated during a Phase I ESA performed by FPM and documented in a January 2018 report. The historic use of the Property was evaluated using Sanborn Fire Insurance maps, which noted that in 1951 the property was used by the Hogan Paint and Chemical Company. This former use was identified as a Recognized Environmental Condition (REC).

Between 1981 and 2006 the property was used for unspecified warehouse/industrial purposes, including use by Natural Science Industries, which was identified on the Integrated Compliance Information System (ICIS) and Facility Index System (FINDS) databases. The ICIS database contains integrated enforcement and compliance information identified by the EPA. The Natural Science Industries (EPA ID #110010709439) listing appears to be related to a Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) compliance issue dating to 1988. This listing was identified as a REC.

Three subsurface structures of unknown purpose were visually identified on the subject property. These subsurface structures, in the context of the former property uses, were identified as a REC.

The adjoining property to the north, across Rockaway Beach Boulevard, was identified as a site with petroleum-contaminated soil and chlorinated solvents in soil vapor. The potential for migration of these contaminants onto the Property was identified as a REC.

2.2 2018 Phase II Investigation

A Phase II investigation was conducted in 2018, with the procedures and results documented in a March 28, 2018 report. A copy of pertinent portions of this report is included in Appendix A. The sample locations are shown on Figure 2.2.1 and the summarized data are included on Tables 2.2.1, 2.2.2, and 2.2.3.

2.2.1 Geophysical Survey

A geophysical survey was conducted on the accessible portions of the Property to locate subsurface obstructions that may be present. Five suspected catch basins containing sediments were noted on the Property. Three catch basins on the north side of the Property were observed to be connected in sequence and the piping appeared to lead toward one of the suspected sewer pits on the northwest corner of the property. The pipe connected to the eastern-most catch basin also appeared to lead toward the east; however, the detected signal ended just before the property boundary.

Three shallow solid-bottom square pits were observed on the northwest corner of the property; these features may have formerly served as sewer connections or cleanouts.

Two drywells that appeared to discharge to the subsurface were observed; one is located on the northwest portion of the property and one is located on the west-central portion of the property. No inlet or outlet pipes were observed inside these structures.

2.2.2 Soil

Soil sampling methods included soil borings through the property surface (Locations B1, B2, and B5 through B10), soil borings through the drywells (B3 and B4), and sediment sampling in one catch basin (CB-2). Soils from just beneath the pavement at the property surface generally included historic fill composed of a gray/black fine to medium-grained sand containing angular gravel, slag, brick, and concrete to about 3 feet below grade. The historic fill was underlain by dark brown/gray-black fine to medium-grained sand with organics, gravel, and silt generally from 3 to 7 feet below grade. Soils from 7 feet below grade and deeper generally consisted of gray fine to medium grained sand. Groundwater was typically estimated at 4-5 feet below grade.

No photoionization detector (PID) responses, staining, odors, sheen, or other indications of potential contaminant releases were observed in the materials encountered in any of the borings, with the exception of boring B9. At boring B9, odors that appeared consistent with paint and petroleum were noted from 1 to 11 feet below grade; organic vapors were detected throughout this interval with a maximum PID response of 1,240 parts per million (ppm) detected at 5 feet below grade. Organic vapor concentrations decreased with depth and no significant PID response was noted below 11 feet.

The samples were tested and the analytical results compared to the NYSDEC Part 375 and CP-51 unrestricted use, restricted residential use, and commercial use SCOs, as shown in Table 2.2.1. The following observations were noted:

- Several petroleum-related VOCs and one chlorinated solvent (trichloroethylene, or TCE) were detected in samples B4 and B9 (depths of 5 feet and 9 feet) at concentrations exceeding the NYSDEC unrestricted use SCOs. Two petroleum-related VOCs in the B9 sample from 5 feet also exceeded the restricted residential use SCOs. VOCs were not detected in any of the other samples at levels above the NYSDEC SCOs;

0' 20' 40' 80'

APPROXIMATE SCALE

LEGEND:

- SOIL BORING LOCATION
- GROUNDWATER SAMPLE LOCATION
- SOIL VAPOR SAMPLE LOCATION

FPM GROUP

FIGURE 2.2.1
PREVIOUS INVESTIGATION LOCATIONS

51-17 ROCKWAY BEACH BOULEVARD
FAR ROCKWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 8/27/18

Z:\PENINSULA ROCKAWAY\DEP\PREV INVESTIGATION.dwg, 9/11/2018 9:40:50 AM, DWG To PDF.pc3

TABLE 2.2.1
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD
FAR ROCKAWAY, NEW YORK

Sample No.	B1	B2	B3	B4	B5	B7	B8	B9			B10	CB-3	6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCRR Part 375 and CP-51 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 and CP-51 Commercial Use Soil Cleanup Objectives
Sample Type	Soil Boring	Soil Boring	Drywell	Drywell	Soil Boring	Soil Boring	Soil Boring	Soil Boring			Soil Boring	Catch Basin			
Sample Depth (feet)	1-3	1-3	2.5-5.5	2-5	1-3	1-3	1-3	2	5	9	1-3	0-2			
Sample Date	2/28/18														
TCL Volatile Organic Compounds in micrograms per kilogram															
1,2,4-Trimethylbenzene	ND	ND	ND	480 J	8.8	ND	ND	ND	ND	1,100	4.4 J	NS	3,600	52,000	190,000
1,3,5-Trimethylbenzene	ND	ND	ND	ND	4.4 J	ND	ND	ND	ND	480 J	ND	NS	8,400	52,000	190,000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	NS	1,800	13,000	130,000
Acetone	15 CCV-E, SCAL-E	ND	ND	ND	26 CCV-E, SCAL-E	28 CCV-E, SCAL-E	ND	16 CCV-E, SCAL-E	ND	ND	35 CCV-E, SCAL-E	NS	50	100,000	500,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	7.7	ND	ND	ND	NS	760	2,400	22,000
Chloroform	4.6 J	7.9	ND	ND	ND	ND	ND	ND	**2,200 J**	ND	ND	NS	370	49,000	350,000
cis-1,2-Dichlorothylene	19	42	ND	ND	ND	49	ND	ND	ND	ND	ND	NS	250	100,00	500,000
Cyclohexane	ND	9.2	ND	21,000	ND	ND	ND	4.0 J	ND	ND	ND	NS	-	-	-
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	21 SCAL-E	**24,000 SCAL-E**	ND	ND	NS	1,000	41,000	390,000
Isopropylbenzene	ND	ND	ND	11,000	ND	ND	ND	16	10,000	ND	ND	NS	-	-	-
Methyl Ethyl Ketone	5.7 J	ND	ND	ND	ND	ND	ND	4.1 J,CCV-E	ND	ND	12	NS	120	100,000	500,000
Methylcyclohexane	ND	26	ND	210,000	ND	4.4 J	ND	8.0	ND	ND	ND	NS	-	-	-
Methylene chloride	ND	14 SCAL-E,B	ND	**860 SCAL-E,J**	ND	ND	ND	ND	**29,000 SCAL-E**	**640 J, SCAL-E**	ND	NS	50	100,000	500,000
n-Butylbenzene	ND	ND	ND	26,000	ND	ND	ND	ND	ND	ND	ND	NS	-	-	-
n-Propylbenzene	ND	ND	ND	**30,000**	ND	ND	ND	22	**21,000**	ND	ND	NS	3,900	100,000	500,000
o-Xylene	ND	ND	ND	ND	ND	ND	ND	94 SCAL-E	**110,000 SCAL-E**	ND	ND	NS	260	100,000	500,000
p- & m-Xylenes	ND	ND	ND	ND	ND	ND	ND	120 SCAL-E	**150,000 SCAL-E**	ND	ND	NS	260	100,000	500,000
p-Isopropyltoluene	ND	ND	ND	3,300	ND	ND	ND	18	18,000	ND	ND	NS	-	-	-
sec-Butylbenzene	ND	ND	ND	10,000	ND	ND	ND	14	8,100	ND	ND	NS	11,000	100,000	500,000
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	6,400 SCAL-E	ND	ND	NS	-	-	-
tert-Butylbenzene	ND	ND	ND	2,200	ND	ND	ND	ND	ND	ND	ND	NS	5,900	100,000	500,000
Toluene	ND	8.4	ND	ND	ND	ND	5.5 J	13	**24,000**	ND	ND	NS	700	100,000	500,000
Trichloroethylene	12	78	330 J	**630 J**	6.4 J	72	ND	ND	**9,300**	ND	ND	NS	470	21,000	200,000
Vinyl Chloride	ND	ND	ND	ND	ND	19	ND	ND	ND	ND	ND	NS	20	900	13,000
TCL Semivolatile Organic Compounds in micrograms per kilogram															
1,1-Biphenyl	ND	ND	ND	773	ND	ND	ND	194	16,400	NS	ND	ND	-	-	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	**2,080**	ND	ND	NS	ND	ND	1,800	13,000	130,000
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	566,000	NS	ND	ND	-	-	-
2-Methylnaphthalene	ND	ND	140	13,900	ND	53.6 J	152	2,770	241,000	NS	306	538	-	-	-
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	342	290,000	NS	419	ND	-	-	-
3- & 4-Methylphenols	ND	ND	ND	ND	ND	ND	ND	1,190	244,000	NS	1,270	225	-	-	-
Acenaphthene	ND	ND	677	4,800	ND	ND	516	ND	5,630	NS	ND	1,660	20,000	100,000	500,000
Acenaphthylene	ND	ND	269	604 J	ND	ND	350	98.7	1,600	NS	ND	651	100,000	100,000	500,000
Anthracene	ND	ND	1,620	5,040	ND	91.0 J	1,570	86.1 J	1,860	NS	129	4,340	100,000	100,000	500,000
Benzo[a]anthracene	ND	ND	**4,830**	**11,800**	ND	359	**4,290**	243	**5,250**	NS	268	**10,300**	1,000	1,000	5,600
Benzo[a]pyrene	ND	ND	**4,600**	**10,400**	ND	470	**4,470**	336	**4,160**	NS	ND	**5,990**	1,000	1,000	1,000
Benzo[b]fluoranthene	ND	ND	**4,030**	**12,800**	ND	412	**4,450**	323	**5,030**	NS	ND	**9,260**	1,000	1,000	5,600
Benzo[g,h,i]perylene	ND	ND	2,330	6,440	ND	368	2,950	490	4,190	NS	179	6,420	100,000	100,000	500,000
Benzo[k]fluoranthene	ND	ND	**3,440**	**8,770**	ND	381	**2,580**	349	**5,490**	NS	ND	**8,840**	800	3,900	56,000
Benzyl butyl phthalate	ND	ND	1,520	ND	ND	ND	ND	128	ND	NS	ND	ND	-	-	-
Bis[2-ethylhexyl]phthalate	ND	ND	2,190	9,850	ND	ND	ND	ND	156,000	NS	ND	2,970	-	-	-
Carbazole	ND	ND	784	762	ND	ND	836	46.7 J	1,420	NS	ND	2,340	-	-	-
Chrysene	ND	ND	**4,770**	**12,400**	ND	369	**4,020**	298	**6,690**	NS	262	**9,320**	1,000	3,900	56,000
Dibenzo[a,h]anthracene	ND	ND	**1,100**	**3,290**	ND	54.4 J	**1,400**	134	**1,610**	NS	ND	**2,220**	330	330	560
Dibenzofuran	ND	ND	390	ND	ND	ND	298	54.9 J	3,390	NS	ND	1,130	-	-	-
Di-n-butyl phthalate	ND	ND	ND	14,200	ND	ND	95.6 J	51.2 J	1,670	NS	ND	1,220	-	-	-
Di-n-octylphthalate	ND	ND	192	ND	ND	ND	ND	ND	ND	NS	ND	ND	-	-	-
Fluoranthene	ND	ND	11,300	32,200	ND	508	9,950	476	14,200	NS	547	24,600	100,000	100,000	500,000
Fluorene	ND	ND	651	5,120	ND	ND	472	ND	4,650	NS	73.2 J	1,600	30,000	100,000	500,000
Indeno[1,2,3-cd]pyrene	ND	ND	**2,290**	**6,310**	ND	306	**2,690**	347	**3,670**	NS	151	**5,690**	500	500	5,600
Naphthalene	ND	ND	248	10,700	ND	ND	214	3,410	**139,000**	NS	634	977	12,000	100,000	500,000
Nitrobenzene	ND	ND	ND	4,440	ND	ND	ND	ND	ND	NS	ND	ND	-	15,000	69,000
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	**4,540**	NS	ND	ND	800	6,700	6,700
Phenanthrene	ND	ND	7,230	30,300	ND	202	6,040	299	15,100	NS	486	18,400	100,000	100,000	500,000
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	**26,600**	NS	ND	ND	330	100,000	500,000
Pyrene	ND	ND	8,730	24,300	ND	583	7,540	485	13,500	NS	523	19,400	100,000	100,000	500,000
Part 375 Pesticides/Herbicides in milligrams per kilogram															
4,4'-DDE	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	ND	**0.0219**	0.0033	8.9	62
4,4'-DDT	NS	NS	NS	NS	NS	NS	0.00271	NS	NS	NS	ND	**0.0176**	0.0033	7.9	47
alpha-Chlordane	NS	NS	NS	NS	NS	NS	0.00584	NS	NS	NS	ND	0.0497	0.094	4.2	24
Dieldrin	NS	NS	NS	NS	NS	NS	**0.0116**	NS	NS	NS	ND	ND	0.005	0.2	1.4
TAL Metals in milligrams per kilogram															
Aluminum	7,800	7,950	266	3,040	2,460	1,920	1,790	3,820	2,310	NS	1,730	ND	-	-	-
Antimony	ND	ND	ND	38.0	ND	ND	ND	0.634	6.12	NS	ND	ND	-	-	-
Arsenic	1.76	1.59	ND	12.9	6.80	4.49	8.01	3.53	5.66	NS	12.3	1.39	13	16	16
Barium	32.5	31.6	26.4	**484**	62.2	53.0	52.9	65.0	276	NS	69.9	ND	350	400	400
Beryllium	ND	ND	ND	ND	ND	ND	0.268	ND	ND	NS	0.430	0.202	7.2	14	590
Cadmium	ND	0.330	ND	**15.0**	ND	ND	0.435	1.45	**4.98**	NS	ND	ND	2.5	4.3	9.3
Calcium	4,170	4,570	1,350	7,050	2,930	6,240	10,900	50,600	6,930	NS	2,300	ND	-	-	-
Chromium	8.51	10.1	3.20	**688**	8.72	4.19	7.57	24.0	**162**	NS	4.77	ND	30	180	1,500
Cobalt	9.46	9.08	0.789	29.9	3.85	4.05	5.88	4.04	4.00	NS	4.03	ND	-	-	-
Copper	**62.1**	**51.1**	8.01	**200**	22.4	15.6	21.3	**68.3**	**279**	NS	25.7	ND	50	270	270
Iron	16,600	15,100	1,930	177,000	6,550	5,030	6,060	8,990	7,840	NS	7,170	ND	-	-	-
Lead	17.8	17.3	16.7	**1,420**	9.80	6.73	47.3	**78.3**	**1,210**	NS	35.3	ND	63	400	1,000
Magnesium	3,290	3,450	139	2,030	276	767	1,190	19,600	10,100	NS	244	ND	-	-	-
Manganese	138	95.2	11.6	689	57.9	105	48.0	128	50.5	NS	85.5	ND	1,600	2,000	10,000
Mercury	0.0582	ND	ND	**4.69**	0.0402	ND	0.0362	**0.676**	0.0992	NS	**1.41**	0.820	0.18	0.81	2.80
Nickel	19.2	20.2	1.87	**107**	9.64	9.09	12.7	12.8	28.8	NS	8.95	4.61	30	310	310
Potassium	990	1,110	47.3	96.4	334	320	225	168	220	NS	143	ND	-	-	-
Selenium	ND	ND	ND	ND	ND	ND	ND	**6.30**	**4.37**	NS	ND	ND	3.9	180	1,500
Silver	ND	ND	ND	**9.44**	ND	ND	ND	ND	1.62	NS	ND	0.614	2	180	1,500
Sodium	691 B	753 B	69.9 B	106 B	129 B	118 B	135 B	31.6 B	780 B	NS	101 B	ND	-	-	-
Thallium	ND	ND	ND	6.72	ND	ND	ND	ND	ND	NS	ND	4.26	-	-	-
Vanadium	48.7	55.3	3.06	32.7	12.1	9.48	7.61	14.1	82.0	NS	7.80	ND	-	-	-
Zinc	46.6	55.5	31.1	**5,630**	47.0	22.6	50.4	**944**	**1,050**	NS	94.6	ND	109	10,000	10,000

Notes:
Only analytes detected in one or more samples are included herein.
J = Estimated concentration below the Reporting Limit but exceeding the Method Detection Limit.
ND = Not detected at or above the method detection limit.
- = Not established
Bold yellow values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives
Bold orange values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives
Bold red values exceed NYSDEC Commercial Use Soil Cleanup Objectives
SCAL-E = The reported value is estimated due to its behavior during initial calibration.
CCV-E = The reported value is estimated due to its behavior during continued calibration.
B = Analyte is found in an associated analysis batch blank.

TABLE 2.2.2
GROUNDWATER CHEMICAL ANALYTICAL DATA
51-17 ROCKAWAY BEACH BOULEVARD
FAR ROCKAWAY, NEW YORK

Analyte	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	NYSDEC Class GA Ambient Water Quality Standards
	2/28/2018								
Volatile Organic Compounds in micrograms per liter									
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	23	ND	5
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	16	ND	5
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	**3,100**	3.3	5
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	**1,300**	4.9	5
2-Butanone	2.5	2.9	1.2	0.70 J	ND	2.0 J	ND	1.3	50
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	6.0 J	ND	-
Acetone	12 ICV-E, SCAL-E	34 ICV-E, SCAL-E	11 ICV-E, SCAL-E	5.5 ICV-E, SCAL-E	16 ICV-E, SCAL-E	23 ICV-E, SCAL-E	27 J, ICV-E, CCV-E	11 ICV-E, SCAL-E	50
Benzene	ND	ND	ND	ND	ND	ND	**42**	ND	0.7
Carbon disulfide	0.32 J	ND	0.44 J	ND	ND	ND	5.8 J	ND	60
Chloroform	3.6	3.9	ND	ND	ND	ND	**120**	ND	7
cis-1,2-Dichloroethylene	**7.4**	**12**	ND	0.58 J	ND	ND	ND	ND	5
Cyclohexane	ND	0.50 J	ND	ND	ND	ND	ND	ND	-
Ethylbenzene	ND	ND	ND	ND	ND	ND	**400**	0.48 J	5
Isopropylbenzene	ND	ND	ND	ND	ND	ND	**66**	ND	5
Methylcyclohexane	ND	1.2	ND	0.78 J	ND	ND	ND	ND	-
Methylene chloride	ND	ND	ND	ND	ND	ND	**800 CCV-E, SCAL-E**	ND	5
n-Butylbenzene	ND	ND	ND	ND	ND	ND	**22**	ND	5
n-Propylbenzene	ND	ND	ND	ND	ND	ND	**100**	ND	5
o-Xylene	ND	ND	ND	ND	ND	ND	**2,100**	**5.4**	5
p- & m-Xylenes	ND	ND	ND	ND	ND	ND	**2,800**	2.2	5
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	**110**	ND	5
tert-Butyl alcohol (TBA)	1.4 CCV-E, J	1.2 CCV-E, J	1.3 CCV-E, J	ND	ND	2.7 CCV-E, J	ND	ND	-
Toluene	ND	3.9	ND	ND	ND	ND	**550**	0.58 J	5
trans-1,2-Dichloroethylene	ND	0.60 J	ND	ND	ND	ND	ND	ND	5
Trichloroethylene	4.8	**6.8**	ND	ND	ND	ND	**180**	ND	5
Vinyl chloride	ND	**4.4**	ND	ND	ND	ND	ND	ND	2

Notes:

Only analytes detected in one or more samples are included herein. See laboratory report for a complete list of analytes.
CCV-E, ICV-E, Scale-E = Estimated concentration due to behavior during calibration.
J = Estimated concentration below the Reporting Limit but exceeding the Method Detection Limit.
ND = Not detected at or above the Method Detection Limit.
NYSDEC = New York State Department of Environmental Conservation
- = Not established.
Bold shaded values exceed NYSDEC Class GA Ambient Water Quality Standards.

FPM

TABLE 2.2.3
SOIL VAPOR SAMPLING RESULTS
51-17 BEACH CHANNEL DRIVE, FAR ROCKAWAY, NEW YORK

Sample No.	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6	SV-7	Indoor Air Background Levels, Residential**	Indoor Air Background Levels, Commercial*
Sample Date	2/28/18								
Volatile Organic Compounds in ug/m^3									
1,1-Dichloroethane	ND	ND	0.979	ND	ND	ND	18.8	<0.25 - <0.25	<0.4 - <0.8
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	**29.7**	<0.25 - 0.7	<0.9 - <1.6
1,2,4-Trimethylbenzene	16.8	14.3	18.2	22.2	17.1	19.2	1,250	<0.25 - 6.3	1.7 - 13.7
1,3,5-Trimethylbenzene	6.00	5.26	5.21	6.39	5.75	6.19	1,840	0.3 - 6.5	<1.3 - 4.6
1,3-Butadiene	1.49	3.65	80.3	47.3	ND	0.553	ND	-	<2.3 - <7.5
1,4-Dichlorobenzene	1.36	3.54	ND	ND	ND	ND	ND	<0.25 - 2.6	<0.8 - 12.5
2-Hexanone	ND	ND	1.25	1.26	2.04	1.74	ND	-	-
2,2,4-Trimethylpentane	ND	ND	ND	ND	1.19	ND	ND	-	-
4-Ethyltoluene	4.56	3.80	4.53	6.29	4.43	4.72	482	-	<1.5 - 5.9
4-Methyl-2-pentanone	ND	ND	ND	5.82	ND	ND	ND	-	<1.2 - 8.1
Acetone	68.2	117	79.8	53.2	71.5	41.6	220	9.9 - 140	32.4 - 120.2
Benzene	8.15	4.41	43.8	124	0.744	0.783	64.9	1.1 - 29	2.1 - 12.5
Carbon disulfide	7.82	9.53	7.94	2.99	12.5	14.4	32.4	-	<0.8 - 6.4
Carbon Tetrachloride	1.49	ND	4.40	ND	**12.5**	ND	**32.9**	<0.25 - 1.1	<0.8 - 0.7
cis-1,2-Dichloroethene	**22.2**	4.64	**21.3**	ND	1.13	ND	ND	<0.25 - 1.2	<0.8 - <2.0
Chloroform	6.06	1.32	8.89	ND	3.90	2.59	136	<0.25 - 4.6	<0.4 - 1.4
Chloromethane	0.522	0.502	0.558	ND	ND	0.580	ND	<0.25 - 5.2	2.1 - 4.4
Cyclohexane	3.42	4.41	3.48	3.86	3.48	5.65	97.4	<0.25 - 19	-
Ethyl Acetate	2.61	3.56	ND	ND	ND	ND	ND	-	<1.0 - 9.5
Ethyl Alcohol	74.4	113	ND	ND	ND	ND	ND	27 - 3,000	-
Ethylbenzene	8.86	7.30	6.56	8.60	4.95	4.86	1,210	0.4 - 13	<1.6 - 7.6
Freon 11	ND	1.27	1.35	ND	1.52	1.14	ND	1.1 - 30	<3.7 - 54.0
Freon 12	1.94	2.01	2.00	1.87	2.19	1.94	ND	<0.25 - 26	4.8 - 32.9
Heptane	77.9	51.6	19.0	43.0	1.35	13.4	343	1 - 33	-
Hexane	198	32.2	18.4	16.5	1.09	1.99	214	0.6 - 35	1.6 - 15.2
Iso-Propyl alcohol	ND	7.92	1.80	1.26	ND	ND	ND	-	-
m&p-xylene	29.6	29.3	26.1	32.5	23.3	22.3	7,640	0.5 - 21	4.1 - 28.5
Methyl Ethyl Ketone	45.1	52.2	14.6	29.5	13.2	14.7	82.6	1.4 - 39	3.3 - 13.5
Methylene chloride	ND	ND	ND	ND	ND	ND	**577**	0.3 - 45	<1.7 - 16.0
o-Xylene	12.0	11.4	10.9	12.5	9.51	9.25	4,950	0.4 - 13	<2.4 - 11.2
Styrene	2.13	1.91	1.83	2.33	1.37	1.33	66.4	<0.25 - 2.3	<1.6 - 4.3
tert-Butyl Alcohol	3.70	4.70	ND	1.95	ND	ND	ND	-	
Tetrachloroethene	6.21	4.48	4.04	3.48	2.87	2.79	ND	<0.25 - 4.1	<1.9 - 25.4
Tetrahydrofuran	10.0	10.6	2.82	4.19	1.68	1.70	ND	<0.25 - 9.4	-
Toluene	27.7	43.0	29.1	70.8	8.67	8.67	1,610	3.5 - 110	10.7 - 70.8
Trichloroethene	**173.0**	**93.0**	**303**	5.43	5.80	3.87	**554**	<0.25 - 0.8	<1.2 - 6.5

Notes:

All samples analyzed using Method TO-15.
Only compounds detected in one or more samples are reported herein. See lab report for complete data.
ug/m^3 = micrograms per cubic meter.
Shaded compounds are those for which the NYSDOH has provided guidance.
Yellow- shaded **bold** results indicate a monitor or mitigate response.
Pink-shaded **bold** results indicate a mitigate response.
ND = Not detected.
* = US EPA BASE Study 2001; 25th to 95th percentiles.
** = NYSDOH Study 2003; 25th to 95th percentiles.

- Several SVOCs were detected in samples B3, B4, B8, B9 (5 feet), and CB-3 at concentrations exceeding the NYSDEC unrestricted use SCOs and, in several cases, the restricted residential or commercial use SCOs. The highest concentrations of SVOCs and metals were identified in soil below the two drywells (B3 and B4) and in sediment within the catch basin (CB-3);
- One pesticide (dieldrin) was detected in the B8 sample at a concentration exceeding the NYSDEC unrestricted use SCO, and two pesticides (4,4'-DDE and 4,4'-DDT) were detectedin the CB-3 sediment sample at concentrations exceeding the NYSDEC unrestricted use SCOs; and
- One or more metals, including copper, mercury, lead, cadmium, and/or others, were detected in samples B1, B2, B4, B8, B9 (depths of 2 feet and 5 feet), and B10 at concentrations exceeding the NYSDEC unrestricted use SCOs and, in several cases, the restricted residential or commercial use SCOs.

Based on these data it was concluded that historic fill is present in the shallow subsurface throughout the Property to a depth of about 3 feet and is generally impacted by SVOCs, metals, and/or pesticides at levels that are typical of historic fill. Several SVOC and/or metals detections exceed the restricted residential or commercial use SCOs, with the greatest impacts noted in the drywells and catch basin. These more elevated levels may reflect the concentration of impacted materials via collection and infiltration of stormwater runoff.

VOCs, including petroleum-related VOCs and the chlorinated solvent TCE, were identified at two locations on the Property (drywell B4 and soil boring B9, near the western side of the property) in exceedance of the NYSDEC's unrestricted use SCOs. Petroleum-related xylenes detections exceed the restricted residential use SCOs at the B9 location at a depth of 5 feet. These impacts are delineated vertically to less than about 11 feet below grade at B9. The observations and test results are indicative of a release of petroleum and chlorinated solvents at this location, perhaps in conjunction with the former use of the property by a paint and chemical company.

2.2.3 Groundwater

Groundwater sampling was conducted at the GW-1 through GW-9 locations, as shown on Figure 2.2.1. At each location, groundwater was noted to be present at about 5 feet below grade no visible indications of potential contamination were noted, with the exception of GW-7 where a paint/petroleum odor was noted.

The samples were tested and the following observations were noted:

- Thirteen VOCs, including petroleum-related VOCs and TCE, were detected in the GW-7 sample at concentrations above the NYSDEC Standards, with several detections noted to be elevated. The GW-7 sample was collected in immediate proximity to the source material at B9 and these results indicate that the source material is resulting in groundwater contamination at the Property;
- One chlorinated VOC (cis-1,2-dichloroethylene, or cis-1,2-DCE) was detected at GW-1 and three chlorinated VOCs (cis-1,2-DCE, TCE, and vinyl chloride, or VC) were detected at GW-2 at concentrations slightly above the NYSDEC Standards. The GW-1 and GW-2 locations are on the northeastern portion of the property. VC and cis-1,2-DCE are breakdown products from TCE and their detection in these two locations suggests that the groundwater flow direction is likely to the northeast from the TCE-impacted source material at B9 and that TCE is breaking down as it migrates in groundwater;

- One petroleum-related VOC (o-xylene) was detected at a level slightly above its NYSDEC Standard at GW-8.This location is about 20 feet south-southwest of the B9/GW-7 location; the absence of significant groundwater impacts in this direction further indicates that the groundwater flow direction appears to be to the northeast; and
- No impacts exceeding the NYSDEC Standards were detected at the GW-3 to GW-6 locations. This suggests that the plume of VOC-impacted groundwater originating from the B9/GW-7 area is narrow and well-defined.

2.2.4 Soil Vapor

Soil vapor samples SV-1 through SV-7 were collected throughout the Property from beneath the concrete slab of the former buildings; the locations are shown on Figure 2.2.1. Each sample was collected and tested in accordance with NYSDOH protocols. The samples were evaluated in accordance with the October 2006 NYSDOH Soil Vapor Intrusion Guidance document and matrices updated in May 2017. Our review of these data indicates the following:

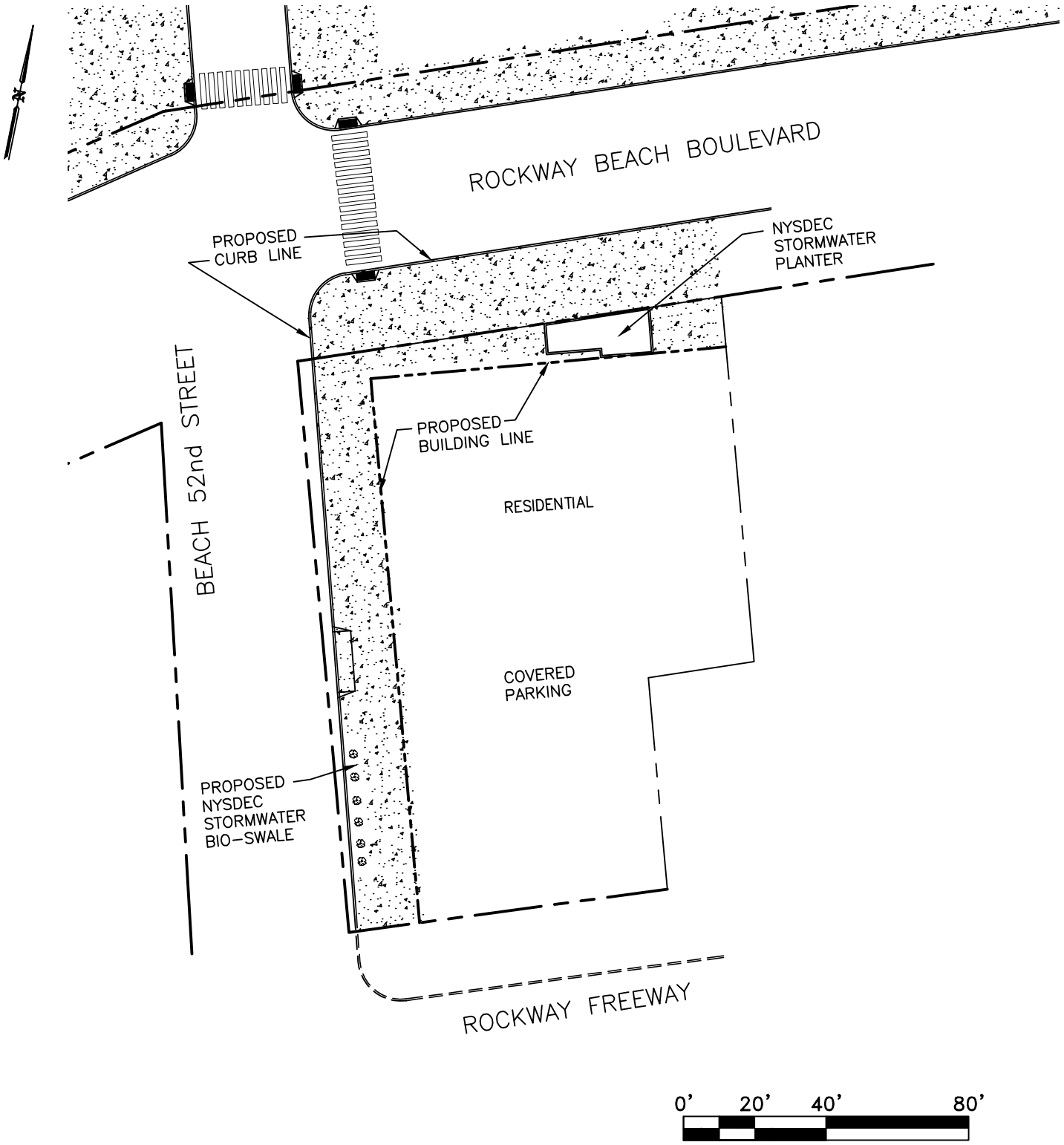
- Five VOCs for which the NYSDOH provides guidance, including carbon tetrachloride (CT), cis-1,2- DCE, TCE, 1,1-dichloroethene (1,1-DCE), and methylene chloride were detected in at least one of the soil vapor samples and may pose a concern for soil vapor intrusion (SVI). Based on a comparison to the NYSDOH guidance, the results for 1,1-DCE at SV-7, CT at SV-5 and SV-7, cis-1,2-DCE at SV-1 and SV-3, and methylene chloride at SV-7 could trigger a monitor or mitigate response, and the levels of TCE at SV-1, SV-2, SV-3, and SV-7 would trigger a mitigate response. All of these VOCs were detected in the source material at B9 and/or in the groundwater beneath the Property and, therefore, the soil vapor detections likely originated from this onsite source; and
- Elevated concentrations of several petroleum compounds were detected at SV-7. These detections also appear related to the impacted soil noted in nearby soil boring B9.

2.3 Anticipated Redevelopment

It is proposed to redevelop the Property, together with other parcels, with mixed commercial and restricted residential uses. A preliminary redevelopment plan is presented in Figure 2.3.1 and shows that the Property is to be completely covered by a new residential building and associated covered parking and pavement. No vegetated areas are proposed, with the exception of a stormwater management planter to be located to the north of the building.

Redevelopment activities will include removal of the existing former building infrastructure (walls, pavement, drywells, etc.) from the Property. Excavation is anticipated to be conducted to 4 feet below grade to accommodate grade beams for the new slab-on-grade building. No basement or other subsurface infrastructure is proposed, other than building foundation elements.

The scope of the Supplemental Phase II ESA investigation was developed to provide additional information concerning the nature and extent of contaminants present onsite. In particular, sampling of the Property's surface soil, subsurface soils, and groundwater was conducted to provide additional information concerning soil and groundwater quality. The scope of work was formulated considering the existing data, the anticipated redevelopment, and the DEP's August 16, 2018 data requests.



FPM GROUP

FIGURE 2.3.1
PROPOSED REDEVELOPMENT PLAN

51-17 ROCKWAY BEACH BOULEVARD
FAR ROCKWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 2/20/19

SECTION 3.0
SUPPLMENTAL PHASE II ESA INVESTIGATION PROCEDURES

The Supplemental Phase II ESA investigation was conducted to evaluate the nature and extent of contamination at the Property, with a focus on the requests in the DEP's August 16, 2018 correspondence and considering the proposed redevelopment plan. The investigation included further evaluations of suspect areas, including the apparent source area at B9, the B4 drywell, and the additional catch basins and drywells. Additional soil and groundwater assessments were also performed throughout the property. This scope of work was in accordance with the conditionally-approved work plan, including the conditions noted in the DEP's October 29, 2018 correspondence.

FPM conducted the Supplemental Phase II Investigation on behalf of the Property owner, Peninsula Rockaway Housing Fund Development Corp. All investigation work was overseen by a Qualified Environmental Professional (QEP).

All field work was performed using a site-specific Health and Safety Plan (HASP), a copy of which was included in the Supplemental Phase II ESA investigation work plan. FPM implemented the HASP during all intrusive activities at the property.

A Quality Assurance Project Plan (QAPP) was also implemented during this investigation. All field QA/QC, laboratory analyses, and data evaluation was performed following the QAPP.

3.1 Supplemental Investigation Scope of Work

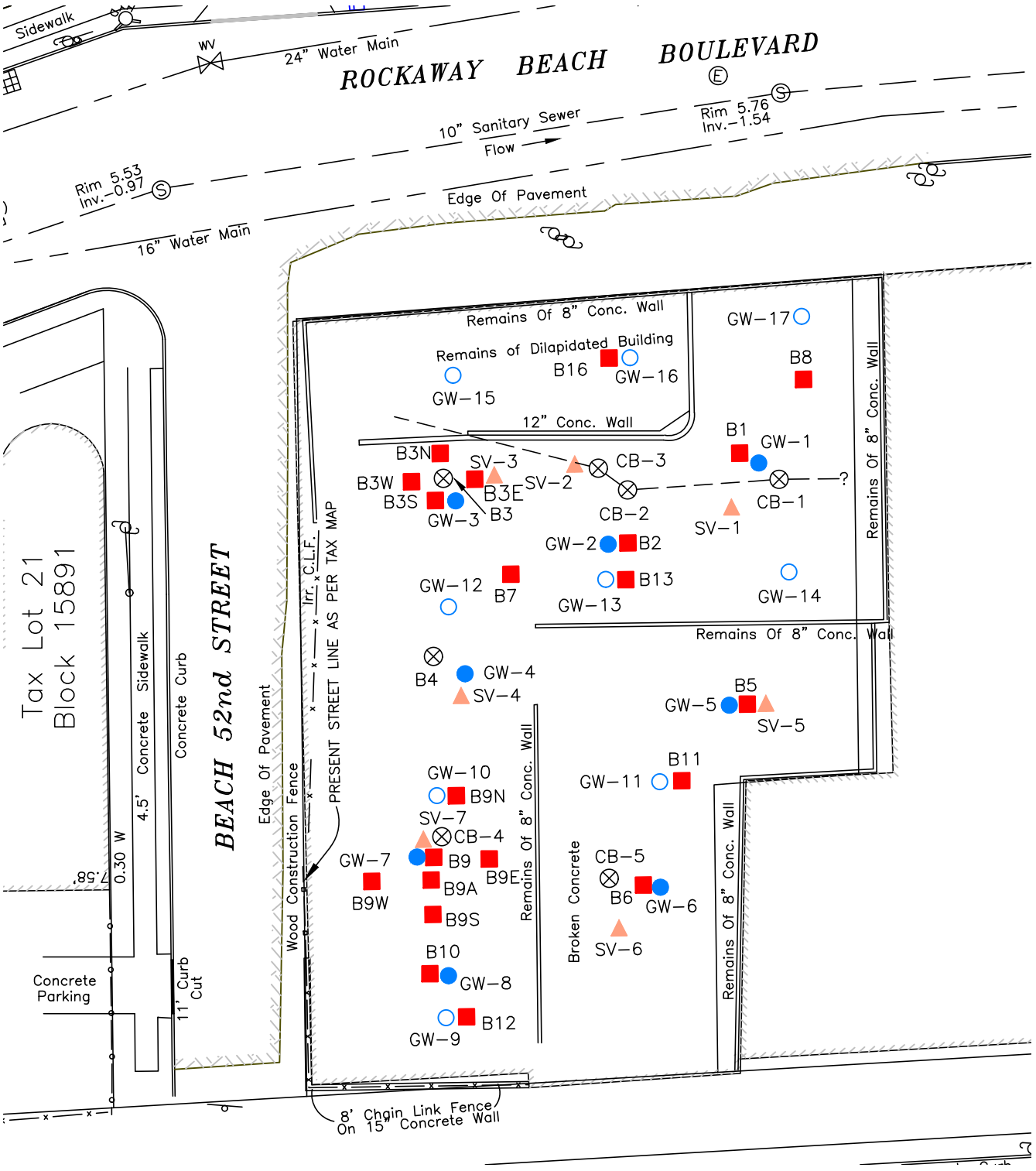
The Supplemental Phase II ESA Investigation sampling was conducted to further investigate and characterize the nature and extent of contamination that may be present at the Property, and included conducting sufficient sampling to fully characterize the onsite soil and groundwater conditions in relation to the proposed redevelopment. Soil vapor sampling was previously conducted throughout the Property and provided sufficient information to evaluate the potential for SVI. Therefore, no additional soil vapor sampling was conducted.

The Supplemental Phase II ESA sampling locations are shown on Figure 3.1.1, together with the previous sampling locations and other Property features. The scope of work included the following components:

- Additional soil sampling in the vicinity of the B9 location and B3 drywell to characterize the nature and extent of contamination previously identified at these locations;

- Sediment sampling in the remaining subsurface structures (catch basins) that were not previously sampled;

- Soil sampling from the upper two feet of soil throughout the Property to characterize shallow soil conditions, soil sampling from 2 to 4 feet to characterize soil to the maximum proposed excavation depth, and soil sampling from 4 to 6 feet below grade to characterize soil in the two-foot interval below the proposed maximum excavation depth. Where groundwater was encountered in this interval; and



LEGEND:

- ⊗ CATCH BASIN/DRY WELL
- SUB-GRADE PIPING
- ■ SOIL BORING LOCATION
- ● GROUNDWATER SAMPLE LOCATION
- ○ GROUNDWATER MONITORING WELL
- ▲ SOIL VAPOR SAMPLE LOCATION

0' 15 30' 60'

APPROXIMATE SCALE

FPM GROUP

FIGURE 3.1.1
SAMPLE LOCATIONS
51-17 ROCKWAY BEACH BOULEVARD
FAR ROCKWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 2/14/19

Z:\PENINSULA ROCKAWAY\DEP\SAMPLE LOCATIONS.dwg, 2/20/2019 10:25:19 AM, DWG To PDF.pc3

- A network of 9 groundwater monitoring wells (GW-9 through GW-17) was installed onsite (shown as open blue circles on Figure 3.1.1); the network of wells was designed to include 1 well on the anticipated upgradient side of the Property (south), 3 wells on the anticipated downgradient side of the Property (north), and 5 wells in the more central portion of the Property. Using these wells, the Site-specific groundwater flow direction was determined and groundwater sampling was performed to further evaluate onsite groundwater conditions and the potential for Site-related groundwater contamination to extend offsite.

3.2 Sampling and Testing Procedures

The procedures for each type of sampling shown on Figure 3.1.1 are described below. QA/QC procedures and results are presented in Section 3.3 and the sample results are discussed in Section 4.

Prior to intrusive work the One Call service was contacted to mark the utilities on the public streets adjoining the Site. The markings were reviewed by the QEP and drilling personnel to evaluate the potential for subsurface utilities in the work areas. No subsurface utilities were identified at any of the targeted locations and no utilities were encountered during the work.

➢ Soil and Sediment Sampling

A soil boring was performed at each of the 13 targeted locations utilizing direct-push sampling equipment. The soil borings were each performed through the existing surface materials (concrete slab, pavement, etc.) and into the underlying soil. Visibly-impacted materials were encountered at several locations and these borings were extended through the visibly-impacted material and into underlying materials that exhibited little to no impact. The soil samples from each boring were obtained continuously, visually examined, screened by the QEP with a calibrated photoionization detector (PID), and classified using the Unified Soil Classification System (USCS). The soil observations were recorded on boring logs (copies included in Appendix B) and the boring locations were identified relative to fixed features on the Property plan. The completed borings were backfilled with soil cuttings and their surface locations were marked with surveyor's flags for future reference.

Sediment samples were obtained from each of the four identified subsurface structures (CB-1, CB-2, CB-4 and CB-5 catch basins) that were not previously sampled. The sediment was sampled using a decontaminated stainless-steel hand auger and the samples were visually inspected by the QEP and screened for organic vapors with a calibrated PID. The sediment observations were recorded in the QEP's field log and the structure locations were identified relative to fixed property features.

The soil and sediment samples collected were submitted for laboratory analysis, as described below. The samples retained for VOC analysis were collected using Method 5035A preservation procedures. Upon completion of sampling, the sample containers were sealed, labeled, managed, transported, and tracked as described below.

➢ Groundwater Monitoring Well Installation and Sampling

Monitoring wells were installed at each of the nine targeted locations (GW-9 through GW-17) by Aarco Environmental, an experienced well installation contractor. An FPM QEP observed each well installation and prepared a well installation log to document the well construction; copies of

the well installation logs are included in Appendix B. The monitoring well locations were identified relative to fixed property features and plotted in a property plan.

Each well includes a two-inch diameter 0.01-inch machine-slotted PVC screen approximately 7 feet long installed to a depth of approximately 5 feet into the water table. The annulus was backfilled with well gravel to the top of the screen, with an overlying one-foot bentonite seal. The top of each well casing was capped with an expansion-fit locking well cap and the casings are each protected with a bolt-down flush-mounted manhole cover set in concrete.

Following installation, the wells were developed by pumping until the parameters pH, temperature, and conductivity varied by less than 10 percent between removals of successive casing volumes of groundwater. Due to the presence of very fine-grained materials (silt and organics) in the saturated zone, the turbidity of the produced groundwater could not be reduced to clarity (less than 50 NTU). The FPM QEP documented the well development procedures; copies of the well development forms are included in Appendix B.

Following well installation, a survey was performed in which the relative elevation of the top of the PVC casing for each well was determined to the nearest 0.01 foot. The static water level for each of the wells was measured and used in conjunction with the surveyed well casing relative elevations to calculate the Property-specific groundwater flow direction, as discussed in Section 4.2.

Groundwater sampling was performed several weeks after the wells were installed to allow for groundwater conditions in proximity to the wells to stabilize. At each well the depth to the static water level and depth of the well was measured by the QEP with an interface probe. The potential presence of light or dense non-aqueous-phase liquid (LNAPLor DNAPL) was assessed using the interface probe results. Then a decontaminated low-flow submersible pump was used to purge each well until the parameters pH, temperature, and conductivity varied by less than 10 percent between removals of successive casing volumes of groundwater. Following the removal of each well volume, field parameters including pH, turbidity, specific conductivity, and temperature were monitored. When all stability parameters varied by less than 10 percent between the removal of successive well volumes, the well was sampled. It was noted that the turbidity of the produced water could not be reduced to less than 50 NTU during the purging process. Well sampling forms documenting the well purging and sampling procedures were completed and copies are included in Appendix B.

Following purging, groundwater sampling was performed. Samples for all analyses were obtained using dedicated disposable polyethylene bailers suspended from dedicated cotton or polypropylene lines. The retrieved samples were decanted into laboratory-supplied sample containers. The aliquot of each sample that was to be tested for dissolved metals was transmitted to the lab in an unpreserved container and filtered in the lab prior to preservation and analysis. Upon completion of sampling, the sample containers were sealed, labeled, managed, transported, and tracked as described below.

- Sample Management and Analyses

Each sample container was labeled using a ball-point pen, and the labeled containers were placed into coolers with iceto depress the sample temperature. A chain of custody form was completed and kept with each of the coolers to document the sequence of sample possession. At the end

of each day, the filled coolers were transported to FPM's office and then picked up by the laboratory courier for delivery to the analytical laboratory.

The analytical laboratory for all soil and groundwater samples was Alpha Analytical of Westborough, Massachusetts, which is NYSDOH ELAP-certified for the analyses that were performed.

All of the soil and groundwater samples were analyzed for TCL VOCs using EPA Method 8260C; TCL SVOCs using Method 8270D, TAL metals (total and dissolved) using Method 6010D, mercury (total and dissolved) using Method 7471B, PCBs using Method 8082A, and pesticides using Method 8081B. As noted above, a separate aliquot of each groundwater sample was obtained, filtered to remove turbidity, and analyzed for TAL metals (dissolved) using Method 6010C and mercury using Method 7471B. The analytical methods used were as per NYS Analytical Services Protocol (ASP).

- Data Evaluation

Following receipt of all sample results, data tables were prepared and the data were evaluated in relation to applicable regulatory criteria. The soil and sediment data were evaluated with respect to the NYSDEC SCOs for unrestricted use (Table 375-6(a)) and for protection of groundwater (Table 375-6(b)). As the planned use of the Property will be commercial and/or multi-family residential, the soil data were also compared to the NYSDEC SCOs for commercial and restricted residential uses (Table 375-6(b)). Groundwater results were compared to the NYSDEC Class GA Ambient Water Quality Standards.

3.3 Quality Assurance/Quality Control Procedures and Results

The Supplemental Phase II ESA Investigation was conducted in accordance with the procedures in the approved QAPP for this Property.

- Field Screening Procedures

Field screening was performed during all sampling activities and included monitoring for organic vapors in soil cuttings as they were generated and in the air in the work zone using a Photovac MicroTIP PID, and visual observations of soil and groundwater characteristics. All readings and observations were performed by the FPM QEP and recorded in his field notebook or on the appropriate field forms. The field screening results were reviewed together with the sample data during the data evaluation process.

- Equipment Decontamination Procedures

All non-disposable downhole equipment (i.e., direct-push rods, hand auger, etc.) used during sampling activities was decontaminated by washing in a potable water and Alconox solution and rinsing in potable water prior to use at each location. All sampling equipment was either dedicated disposable equipment or was decontaminated prior to use at each location. The decontamination procedures utilized for all non-disposable sampling equipment were as per the QAPP.

➢ QA/QC Samples

QA/QC samples were collected and utilized to evaluate the potential for field or laboratory contamination and to evaluate the laboratory's analytical precision and accuracy. The QA/QC samples collected included equipment (field) blanks, trip blanks (for VOCs), and duplicates.

Decontamination procedures were evaluated by the use of equipment blank samples, which consisted of aliquots of laboratory-supplied water that were poured over or through the dedicated or decontaminated sampling equipment and then submitted to the laboratory for analysis. An equipment blank sample was prepared for each day that soil or groundwater sampling was conducted at the Site and was analyzed for the same analytes as the primary environmental samples collected that day.

The analytical results from the equipment blank samples are included in the laboratory reports in Appendix C. These results were reviewed to evaluate the potential for cross-contamination from field procedures to have affected the laboratory results. The results of this review are summarized as follows:

- The equipment blank sample collected during the January 4, 2019 soil sampling event did not show any detections of pesticides or PCBs. Low estimated concentrations of one VOC and one SVOC were noted in the equipment blank; these detections were sufficiently low such that the associated data for the soil samples would not have been affected at significant levels. Low and generally estimated concentrations of several metals, including primarily sodium, calcium, and potassium, were noted in the equipment blank sample. These detections do not present a concern for significant cross-contamination of the associated soil sample results.

- The equipment blank sample collected during the January 17, 2019 soil sampling event did not show any detections of VOCs or PCBs. A low estimated concentration of one SVOC, two pesticides, and one metal were noted in the equipment blank; these detections were sufficiently low such that the associated data for the soil samples would not have been affected at significant levels. These detections do not present a concern for significant cross-contamination of the associated soil sample results.

- The equipment blank sample collected during the February 8, 2019 groundwater sampling event did not show any detections of VOCs, pesticides, or PCBs. Low and generally estimated concentrations of one SVOC and several metals were noted in the equipment blank; these detections were sufficiently low such that the associated data for the groundwater samples would not have been affected at significant levels. These detections do not present a concern for significant cross-contamination of the associated groundwater sample results.

Trip blank samples were utilized to evaluate the potential for VOC cross-contamination between samples in the same cooler. Trip blank samples consisted of laboratory-provided containers filled with laboratory water that are sealed in sample containers at the laboratory and transported to and in the field with the other sample containers. A trip blank was shipped with each group of soil and groundwater samples that were tested for VOCs and was managed in the field and analyzed in the laboratory in the same manner as the primary environmental samples.

The analytical results from the trip blank samples are included in the laboratory reports in Appendix C. These results were reviewed to evaluate the potential for cross-contamination between samples to have affected the laboratory results. The results of this review are summarized as follows:

- The trip blank sample used during the January 4, 2019 soil sampling event did not show any detections of VOCs. Therefore, there does not appear to be a potential for cross-contamination between the soil samples collected during this event.

- The trip blank sample used during the January 17, 2019 soil sampling event did not show any detections of VOCs. Therefore, there does not appear to be a potential for cross-contamination between the soil samples collected during this event.

- The trip blank sample used during the February 8, 2019 groundwater sampling event did not show any detections of VOCs. Therefore, there does not appear to be a potential for cross-contamination between the groundwater samples collected during this event.

Blind duplicate samples were obtained at a frequency of one per every 20 environmental samples and were used to attest to the precision of the laboratory. A blind duplicate consists of a separate aliquot of sample collected at the same time, in the same manner, and analyzed for the same parameters as the primary environmental sample. The blind duplicate sample results are compared to those of the primary environmental sample to evaluate laboratory analytical precision.

The analytical results from the blind duplicate samples are presented on the soil and groundwater data tables in Section 4 together with the data from the associated primary environmental samples. These results were reviewed to evaluate the precision of the laboratory results. The results of this review are summarized as follows:

- The results from primary environmental soil sample B3N(4-6) and duplicate sample B3N(4-6)D are very similar, indicating that the associated laboratory results are anticipated to be reasonably precise.

- The results from primary environmental soil sample B9N(4-6) and duplicate sample B9N(4-6)D are very similar, indicating that the associated laboratory results are anticipated to be reasonably precise.

- The results from primary environmental sediment sample CB-4 and duplicate sample CB-4D are very similar, indicating that the associated laboratory results are anticipated to be reasonably precise.

- The results from primary environmental groundwater sample GW-17 and duplicate sample GW-17D are very similar, indicating that the associated laboratory results for the groundwater samples are anticipated to be reasonably precise.

➢ Chain-of-Custody Procedures

For each day of sampling, chain-of-custody (COC) sheets were completed and submitted to the laboratory with the samples collected that day. A copy of each COC sheet was retained by the FPM QEP for sample tracking purposes. Each COC sheet included the project name, the

sampler's signature, the sampling locations and intervals, and the analytical parameters requested. The COC sheets were used during the data evaluation process to verify that all of the collected samples were analyzed as directed and that all of the analytical results were provided by the laboratory. No issues were identified during the COC review.

➢ Data Usability Evaluations

All chemical analytical results were evaluated using the sample data packages, sample data summary packages, and case narratives provided by the analytical laboratory. The data evaluation was performed for each laboratory report to verify that the analytical results are of sufficient quality to be relied upon to assess the potential presence of contaminants in the groundwater and soil samples. The results of the data usability evaluation for each laboratory report are as follows:

- For laboratory report L1900818 (soil samples collected January 4, 2019), method blanks (MBs) were generally non-detect for all constituents and laboratory control sample (LCS) results were generally within acceptance ranges. Some low-level exceedances of acceptance criteria were noted, but not at levels that would significantly affect the associated data. Some samples required dilution due to the sample matrix; elevated detection limits are noted for these samples. Surrogate recoveries were outside of acceptance criteria for one sample for VOCs and one sample for SVOCs. Re-analysis of these samples produced similar results and both sets of analyses are reported. These minor issues do not materially affect the analytical results for the primary environmental samples and the lab results are of sufficient quality to be used for their intended purpose.

- For laboratory report L1902518 (soil samples collected January 17, 2019), MBs were non-detect for nearly all constituents and LCS results were generally within acceptance ranges. Some low-level exceedances of LCS acceptance criteria were noted, but not at levels that would significantly affect the associated data. Some samples required dilution due to the sample matrix; elevated detection limits are noted for these samples. Surrogate recoveries were outside of acceptance criteria for several samples for SVOCs, one sample for PCBs, and several samples for pesticides. Re-analysis produced similar results and, where available, both sets of analyses are reported. These minor issues do not materially affect the analytical results for the primary environmental samples and the lab results are of sufficient quality to be used for their intended purpose.

- For laboratory report L1905396 (groundwater samples collected February 8, 2019), MBs were non-detect for nearly all constituents and LCS results were generally within acceptance ranges. Some low-level exceedances of LCS acceptance criteria were noted, but not at levels that would significantly affect the associated data. Some samples required dilution for SVOC analyses due to the sample matrix; elevated detection limits are noted for these samples. The matrix spike recoveries were outside of acceptance criteria for several samples due to elevated concentrations of select metals in the parent samples. The matrix spike recovery for mercury was outside of acceptance criteria, but a post-digestion spike was performed and was within acceptance criteria. These minor issues do not materially affect the analytical results for the primary environmental samples and the lab results are of sufficient quality to be used for their intended purpose.

SECTION 4.0
SUPPLMENTAL PHASE II ESA INVESTIGATION RESULTS

The results of the Supplemental Phase II ESA Investigation are presented below and are reviewed together with the existing environmental data discussed in Section 2 to evaluate the nature and extent of contamination at the Property. This evaluation considers the proposed redevelopment of the Property with restricted residential and commercial uses.

4.1 Soil Conditions

Soil Observations

The soil boring logs presented in Appendix B document that historic fill is present at nearly all locations from beneath the pavement at the property surface to about 3 feet below grade. Historic fill was not identified in the B9N, B9S, or B9W borings. The historic fill is generally composed of a gray/black to brown fine to medium-grained sand containing angular gravel, slag, brick, concrete, and/or asphalt. The historic fill is underlain by dark brown/gray-black fine to medium-grained sand with organics, gravel, and silt generally from 3 to 7 feet below grade. Soils from 7 feet below grade and deeper generally consisted of gray fine to medium grained sand with gravel. Groundwater was typically encountered at about 4 feet below grade. This information is consistent with the prior boring log data for the Property, as discussed in Section 2.

No PID responses, staining, odors, sheen, or other indications of potential contaminant releases were observed in the materials encountered in any of the borings, with the following exceptions:

- Organic vapors were recorded in the interval from about 2 to 6 feet below grade in the four borings (B3N, B3E, B3S and B3W) surrounding the B3 drywell location. No odors, staining or other visible indications suggestive of potential contamination were noted in these materials;

- Organic vapors and a petroleum/paint odor were recorded in the interval generally ranging from 2 to 8 feet below grade in the five borings (B9A, B9N, B9E, B9S, and B9W) surrounding the former B9 location. As discussed in Section 2, at boring B9 odors that appeared consistent with paint and petroleum had been noted from 1 to 11 feet below grade; organic vapors were detected throughout this interval with a maximum PID response of 1,240 ppm detected at 5 feet below grade. Organic vapor concentrations decreased with depth and no significant PID response was noted below 11 feet. For the five borings surrounding former boring B9 (B9A, B9N, B9E, B9S, and B9W) indications of contamination were noted but generally to a lesser extent. At the B9N location, the odors and PID readings increased downward to 4 feet below grade and then decreased at greater depths. The greatest amounts of odor and organic vapors were noted in boring B9N at about 4 feet below grade, where the PID indicated 665 ppm of organic vapors. Lower indications of potential contamination noted in the other borings. The impacts noted at B9N were less than the impacts previously noted at B9; and

- A slight petroleum odor was noted in the historic fill interval in boring B16 and organic vapor readings were noted between 2 and 5 feet below grade, with the highest reading (45.6 ppm) at 2 feet below grade.

The four sampled subsurface catch basins (CB-1, CB-2, CB-4 and CB-5) were found to be solid-bottom structures. CB-1, CB-2 and CB-4 were approximately 3 feet deep and CB-5 was approximately 1 foot deep. The sediments in these structures generally consisted of fine to coarse

sand with fragments of brick, concrete and asphalt. No odors, staining or other indications of potential contamination were noted in any of these samples, with the exception of CB-4, where a strong paint/petroleum odor and elevated PID readings (greater than 2,000 ppm) were noted. CB-4 is located in the area of boring B9 where similar indications of impacts were noted.

Soil Chemical Analytical Results

The soil and sediment samples were tested and the analytical results compared to the NYSDEC Part 375 and CP-51 unrestricted use, restricted residential use, commercial use and protection of groundwater SCOs, as shown in Table 4.1.1. The following observations were noted:

- In the borings in the B3 drywell area (borings B3N, B3E, B3S and B3W), several VOCs, including TCE, cis-1,2-DCE, methylene chloride, toluene, and acetone, were noted to be present in the historic fill generally at depths of up to 4 feet below grade at levels exceeding the NYSDEC unrestricted use and/or protection of groundwater SCOs. None of these detections exceeded either the restricted residential or commercial use SCOs. Several SVOCs were found primarily in the historic fill to 2 feet below grade at B3N, B3E and B3S at levels that exceeded the restricted residential use, commercial use, and/or protection of groundwater SCOs. Some of these SVOCs were also found in the native soil at 4 to 6 feet below grade at B3N and B3E at levels that exceeded the restricted residential use SCOs. The exceedances were all for polycyclic aromatic hydrocarbons (PAHs) and are typically associated with petroleum-impacted materials. No PCBs were detected in the B3 area borings and none of the detected pesticides exceeded any of the SCOs. One metal detection (zinc in historic fill at 2 to 4 feet below grade in B3W) exceeded its unrestricted use SCO; none of the other metal detections exceeded any SCOs. These results are consistent with the observations of soil conditions in the B3 area, which included organic vapors in the interval from about 2 to 6 feet below grade.

- For the borings in the B9 drywell area (borings B9A, B9N, B9E, B9S and B9W), several petroleum-related VOCs, including toluene, ethylbenzene, xylenes, isopropylbenzene, naphthalene, and trimethylbenzenes were noted to be present in all of the soil samples from boring B9N at levels exceeding the NYSDEC unrestricted use, protection of groundwater, restricted residential use and/or commercial use SCOs. No exceedances of SCOs were noted for VOCs in any of the other borings from the B9 area and no chlorinated VOCs were noted to exceed the SCOs in these samples. Several PAH SVOCs were also found in all of the samples from boring B9N at levels that exceeded multiple SCOs. No SVOCs exceeded the SCOs in any of the other soil samples from the B9 area and none of the PCB, pesticide or metals detections in these other borings exceeded any SCOs. PCBs, one pesticide, and two metals (lead and zinc) were detected in samples from the B9N boring at levels exceeding SCOs. These results are consistent with the observations of soil conditions in the B9 area, which included organic vapors and paint/petroleum odors in the interval from about 2 to 8 feet below grade.

- At boring B10 the VOC acetone slightly exceeded its unrestricted use and protection of groundwater SCO in the 4 to 6-foot interval and zinc exceeded its unrestricted use SCO in the 0 to 2-foot interval. No other exceedances were noted in the samples from this boring and the materials in this boring did not exhibit any visual indications of potential impacts;

TABLE 4.1.1
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B3N			B3N DUPLICATE	B3E			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Native	Fill	Fill/Native	Native				
Sample Date	1/17/19										
TCL Volatile Organic Compounds in micrograms per kilogram											
Methylene chloride	**440**	**290 J**	ND	ND	ND	**600**	ND	50	100,000	500,000	50
1,1-Dichloroethane	ND	ND	ND	ND	ND	17 J	ND	270	26,000	240,00	270
Chloroform	ND	270	1.3 J	2.0 J	0.78 J	**400**	23 J	370	49,000	350,000	370
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	760	2,400	22,000	760
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Tetrachloroethene	ND	19 J	ND	ND	ND	19 J	ND	1,300	19,000	150,000	1,300
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	21 J	ND	20	3,100	30,000	20
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	680	100,000	500,000	680
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	600
Benzene	ND	26 J	ND	0.56 J	0.31 J	20 J	ND	60	4,800	44,000	60
Toluene	ND	**1,900**	1.6 J	4.5	0.77 J	420	ND	700	100,000	500,000	700
Ethylbenzene	ND	15 J	ND	ND	ND	ND	ND	1,000	41,000	390,000	1,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Vinyl chloride	ND	ND	ND	ND	ND	160	ND	20	900	13,000	20
Chloroethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
trans-1,2-Dichloroethene	ND	52 J	ND	ND	ND	80 J	ND	190	100,000	500,000	190
Trichloroethene	**910**	**10,000**	8.8	30	28	**7,300**	370	470	21,000	200,000	470
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	2,400	49,000	280,000	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1,800	13,000	130,000	1,800
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	930	100,000	500,000	930
p/m-Xylene	ND	82 J	ND	ND	ND	51 J	ND	-	-	-	-
o-Xylene	ND	66 J	ND	ND	ND	24 J	ND	-	-	-	-
Xylenes, Total	ND	150 J	ND	ND	ND	75 J	ND	260	100,000	500,000	1,600
cis-1,2-Dichloroethene	**940**	**950**	1.7 J	5.3	0.79 J	**5,100**	210	250	100,000	500,000	250
1,2-Dichloroethene, Total	940	1,000 J	1.7 J	5.3	0.79 J	5,200 J	210	-	-	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Styrene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetone	ND	ND	40	**86**	16	ND	ND	50	100,000	500,000	50
Carbon disulfide	ND	ND	16 J	41	ND	ND	ND	-	-	-	2,700
2-Butanone	ND	ND	ND	5.1 J	ND	ND	ND	120	100,000	500,000	300
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	-	-	-	300
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	12,000	100,000.00	500,000.00	12,000
sec-Butylbenzene	ND	34 J	ND	ND	ND	ND	ND	11,000	100,000	500,000	11,000
tert-Butylbenzene	ND	160	0.23 J	0.38 J	ND	ND	ND	5,900	100,000	500,000	5,900
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Isopropylbenzene	ND	26 J	ND	ND	ND	ND	ND	2,300	-	-	-
p-Isopropyltoluene	ND	100	ND	ND	ND	10 J	ND	10,000	-	-	-
Naphthalene	740	87 J	19	41	1.6 J	65 J	680	12,000	100,000	500,000	12,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	3,900	100,000	500,000	3,900
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3,5-Trimethylbenzene	ND	370	ND	0.49 J	ND	ND	ND	8,400	52,000	190,000	8,400
1,2,4-Trimethylbenzene	ND	220	ND	1.2 J	0.54 J	ND	ND	3,600	52,000	190,000	3,600
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	100	13,000	130,000	100
p-Diethylbenzene	ND	1,100	ND	1.3 J	ND	ND	ND	-	-	-	-
p-Ethyltoluene	ND	140	ND	ND	ND	ND	ND	-	-	-	-
1,2,4,5-Tetramethylbenzene	ND	240	ND	0.61 J	ND	ND	ND	-	-	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

FPM

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B3N			B3N DUPLICATE	B3E			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Native	Fill	Fill/Native	Native				
Sample Date	1/17/19										
TCL Semivolatile Organic Compounds in micrograms per kilogram											
Acenaphthene	**24,000**	ND	940	54 J	9,100	ND	2,000	20,000	100,000	500,000	98,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	330	1,200	6,000	1,400
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1,000	100,000	500,000	1,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	2,400	49,000	280000	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	1,800	13,000	130,000	1,800
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	-	-	-	1,000
Fluoranthene	94,000	ND	3,800	260 J	49,000	850 J	7,500	100,000	100,000	500,000	1,000,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Naphthalene	**19,000**	ND	720	ND	6,700	ND	1,200	12,000	100,000	500,000	12,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	-	15,000	69,000	17,000
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	-	-	-	435,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	-	-	-	8,100
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	-	-	-	120,000
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	-	-	-	27,000
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzo(a)anthracene	**34,000**	ND	**1,300**	94 J	**14,000**	650 J	**2,800**	1,000	1,000	5,600	1,000
Benzo(a)pyrene	**32,000**	ND	1,000	ND	**12,000**	ND	**2,500**	1,000	1,000	1,000	22,000
Benzo(b)fluoranthene	**37,000**	ND	**1,300**	100 J	**18,000**	ND	**3,000**	1,000	1,000	5,600	1,700
Benzo(k)fluoranthene	**13,000**	ND	390	ND	**3,700**	ND	**1,100**	800	3,900	56,000	1,700
Chrysene	**29,000**	ND	990	80 J	**11,000**	560 J	**2,500**	1,000	3,900	56,000	1,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000	107,000
Anthracene	36,000	ND	1,500	ND	13,000	ND	3,000	100,000	100,000	500,000	1,000,000
Benzo(ghi)perylene	18,000	ND	590	ND	8,300	ND	1,200	100,000	100,000	500,000	1,000,000
Fluorene	23,000	ND	920	51 J	9,800	ND	2,200	30,000	100,000	500,000	386,000
Phenanthrene	**110,000**	ND	4,600	270 J	65,000	590 J	9,400	100,000	100,000	500,000	1,000,000
Dibenzo(a,h)anthracene	**3,800**	ND	130 J	ND	**1,700**	ND	330	330	330	560	1,000,000
Indeno(1,2,3-cd)pyrene	**19,000**	ND	**640**	ND	**9,100**	ND	**1,400**	500	500	5,600	8,200
Pyrene	77,000	ND	3,000	200 J	41,000	890 J	5,700	100,000	100,000	500,000	1,000,000
Biphenyl	3,000	ND	120 J	ND	1,400	ND	210 J	-	-	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	-	-	-	220
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibenzofuran	18,000	ND	720	ND	**7,400**	ND	1,500	7,000	59,000	350,000	-
2-Methylnaphthalene	9,700	ND	390 J	ND	4,300	ND	700	-	-	-	36,400
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dimethylphenol	300 J	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	-	-	-	
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	800	6,700	6,700	800
Phenol	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000	-
3-Methylphenol/4-Methylphenol	320 J	ND	ND	ND	130 J	ND	ND	330	100,000	500,000	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Carbazole	14,000	ND	580	ND	5,600	ND	1,400	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

FPM

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B3N			B3N DUPLICATE	B3E			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Native	Fill	Fill/Native	Native				
Metals in milligrams per kilogram											
Aluminum, Total	3,030	1,350	377	471	1,310	3,830	1,410	-	-	-	-
Antimony, Total	ND	ND	ND	ND	ND	2.23 J	1.60 J	-	-	-	-
Arsenic, Total	1.30	2.44	1.69 J	1.55 J	1.57	0.721 J	0.613 J	13	16	16	16
Barium, Total	23.4	34.2	13.4	13.2	7.22	21.2	11.2	350	400	400	820
Beryllium, Total	0.131 J	0.107 J	ND	ND	0.550	ND	0.088 J	7.2	72	590	47
Cadmium, Total	0.105 J	0.190 J	ND	ND	ND	ND	ND	2.5	4.3	9.3	7.5
Calcium, Total	38,300	3,130	2,410	652	9,370	2,290	10,300	-	-	-	-
Chromium, Total	12.4	4.61	4.48	5.86	6.48	8.03	4.84	30	180	1,500	-
Cobalt, Total	2.90	2.46	0.988 J	1.44 J	0.833 J	6.02	1.72 J	-	-	-	-
Copper, Total	10.9	22.6	1.84	1.09 J	1.11	31.2	5.64	50	270	270	1,720
Iron, Total	6,440	5,500	2,150	2,360	4,890	9,640	3,200	-	-	-	-
Lead, Total	5.18	14.5	8.95	9.11 J	3.60 J	8.17	5.69	63	400	1,000	450
Magnesium, Total	9,210	745	255	128	327	2,430	2,440	-	-	-	-
Manganese, Total	112	48.0	23.1	25.8	46.0	72.8	40.0	1,600	2,000	10,000	2,000
Mercury, Total	ND	ND	ND	ND	ND	0.085	ND	0.18	0.81	2.8	0.73
Nickel, Total	5.46	5.61	0.900 J	1.06 J	1.44 J	8.92	2.16 J	30	310	310	130
Potassium, Total	477	116 J	59.6 J	152 J	262	613	185 J	-	-	-	-
Selenium, Total	ND	0.272 J	ND	ND	ND	ND	ND	3.9	180	1,500	4
Silver, Total	ND	ND	ND	ND	ND	ND	ND	2	180	1,500	8.3
Sodium, Total	176	61.4 J	25.6 J	54.0 J	51.8 J	226	83.0 J	-	-	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Vanadium, Total	14.0	12.2	4.45	6.35	3.70	27.4	5.27	-	-	-	-
Zinc, Total	18.7	43.3	4.25 J	1.60 J	16.0	27.1	12.4	109	10,000	10,000	2,480
Pesticides in micrograms per kilogram											
Delta-BHC	0.568 JIP	ND	ND	ND	ND	ND	ND	40	100,000	500,000	250
Lindane	ND	ND	ND	ND	ND	ND	ND	100	1,300	9,200	100
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	20	480	3,400	20
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	36	360	3,000	90
Heptachlor	2.68 IP	ND	ND	ND	0.768 JP	ND	ND	42	2,100	15,000	380
Aldrin	ND	ND	ND	ND	ND	ND	ND	5	97	680	190
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	-	-	-	20
Endrin	ND	ND	ND	ND	ND	ND	ND	14	11,000	89,000	60
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	ND	5	200	1,400	100
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	3.3	8,900	62,000	17,000
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	3.3	13,000	92,000	14,000
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	3.3	7,900	47,000	136,000
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan II	4.63 IP	ND	ND	ND	0.626 JIP	ND	ND	2,400	24,000	200,000	102,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	1,000,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	-	-	-	900,000
Toxaphene	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-Chlordane	ND	ND	1.73 J	ND	ND	ND	ND	94	4,200	24,000	2,900
trans-Chlordane	ND	ND	4.48	ND	0.892 JIP	ND	1.17 JP	-	-	-	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Polychlorinated Biphenyls in micrograms per kilogram											
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200

Notes:

ND = Not detected.

J = Estimated concentration below the RL but above the MDL.

I = Lower value reported due to obvious interference.

P = The RPD between the results exceeds the method-specified criteria.

Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B3S			B3W			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native				
Sample Date	1/17/19									
TCL Volatile Organic Compounds in micrograms per kilogram										
Methylene chloride	ND	ND	ND	ND	ND	5.0 J	50	100,000	500,000	50
1,1-Dichloroethane	ND	ND	ND	ND	ND	0.27 J	270	26,000	240,00	270
Chloroform	1.2 J	0.84 J	0.83 J	ND	13 J	2.4 J	370	49,000	350,000	370
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	760	2,400	22,000	760
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	1,300	19,000	150,000	1,300
Chlorobenzene	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	20	3,100	30,000	20
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	680	100,000	500,000	680
Bromodichloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromoform	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	-	-	-	600
Benzene	ND	2.0	ND	ND	51	1.1	60	4,800	44,000	60
Toluene	2.2	11	ND	ND	410	1.1	700	100,000	500,000	700
Ethylbenzene	0.21 J	4.2	ND	ND	22 J	1.2 J	1,000	41,000	390,000	1,000
Chloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromomethane	0.77 J	ND	1.6 J	ND	ND	ND	-	-	-	-
Vinyl chloride	0.55 J	ND	ND	ND	ND	ND	20	900	13,000	20
Chloroethane	ND	ND	ND	ND	ND	ND	-	-	-	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
trans-1,2-Dichloroethene	0.23 J	ND	ND	ND	24 J	0.34 J	190	100,000	500,000	190
Trichloroethene	27	16	0.19 J	2.0	**1,000**	56	470	21,000	200,000	470
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	2,400	49,000	280,000	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,800	13,000	130,000	1,800
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	930	100,000	500,000	930
p/m-Xylene	0.70 J	64	ND	ND	140	6.5	-	-	-	-
o-Xylene	0.43 J	6.9	ND	ND	26 J	4.2	-	-	-	-
Xylenes, Total	1.1 J	71	ND	ND	170 J	11	260	100,000	500,000	1,600
cis-1,2-Dichloroethene	7.6	7.3	ND	0.26 J	**1,000**	16	250	100,000	500,000	250
1,2-Dichloroethene, Total	7.8 J	7.3	ND	0.26 J	1,000 J	16 J	-	-	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Styrene	ND	ND	ND	ND	ND	ND	-	-	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetone	24	**180**	32	19	ND	34	50	100,000	500,000	50
Carbon disulfide	ND	ND	8.8 J	ND	ND	ND	-	-	-	2,700
2-Butanone	ND	27 J	ND	ND	ND	ND	120	100,000	500,000	300
Vinyl acetate	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	300
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Butylbenzene	ND	ND	ND	ND	13 J	ND	12,000	100,000.00	500,000	12,000
sec-Butylbenzene	ND	0.79 J	ND	0.18 J	15 J	ND	11,000	100,000	500,000	11,000
tert-Butylbenzene	0.52 J	5.3 J	ND	0.16 J	50 J	0.29 J	5,900	100,000	500,000	5,900
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	-	-	-	-
Isopropylbenzene	ND	4.4	ND	ND	22 J	0.39 J	2,300	-	-	-
p-Isopropyltoluene	0.74 J	1.6 J	ND	0.15 J	11 J	0.23 J	10,000	-	-	-
Naphthalene	0.88 J	ND	ND	2.5 J	ND	6.2 J	12,000	100,000	500,000	12,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Propylbenzene	ND	1.8 J	ND	ND	20 J	0.44 J	3,900	100,000	500,000	3,900
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3,5-Trimethylbenzene	0.74 J	8.6	ND	0.77 J	35 J	2.2 J	8,400	52,000	190,000	8,400
1,2,4-Trimethylbenzene	0.58 J	16	ND	1.1 J	50 J	3.3 J	3,600	52,000	190,000	3,600
1,4-Dioxane	ND	ND	ND	ND	ND	ND	100	13,000	130,000	100
p-Diethylbenzene	2.3 J	4.4 J	ND	1.3 J	25 J	1.5 J	-	-	-	-
p-Ethyltoluene	0.62 J	4.3 J	ND	0.75 J	44 J	2.9 J	-	-	-	-
1,2,4,5-Tetramethylbenzene	0.44 J	2.2 J	ND	0.33 J	56 J	ND	-	-	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B3S			B3W			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native				
Sample Date	1/17/19									
TCL Semivolatile Organic Compounds in micrograms per kilogram										
Acenaphthene	ND	ND	ND	140	ND	ND	20,000	100,000	500,000	98,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	330	-	-	1,400
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,000	-	-	1,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	2,400	-	-	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,800	-	-	1,800
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	-	-	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	-	-	-	1,000
Fluoranthene	4,000 J	ND	65 J	800	ND	110 J	100,000	100,000	500,000	1,000,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Isophorone	ND	ND	ND	ND	ND	ND	-	-	-	-
Naphthalene	ND	ND	ND	170 J	ND	ND	12,000	100,000	500,000	12,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	-	-	-	17,000
NDPA/DPA	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	-	-	-	435,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-	-
Di-n-butylphthalate	ND	ND	160 J	ND	ND	ND	-	-	-	8,100
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	-	-	-	120,000
Diethyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-	27,000
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzo(a)anthracene	**2,800 J**	ND	35 J	280	ND	58 J	1,000	1,000	5,600	1,000
Benzo(a)pyrene	**3,900 J**	ND	ND	270	ND	ND	1,000	1,000	1,000	22,000
Benzo(b)fluoranthene	4,500 J	ND	51 J	300	ND	99 J	1,000	1,000	5,600	1,700
Benzo(k)fluoranthene	**1,800 J**	ND	ND	120	ND	ND	800	3,900	56,000	1,700
Chrysene	**2,600 J**	ND	31 J	240	ND	55 J	1,000	3,900	56,000	1,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000	107,000
Anthracene	ND	ND	ND	230	ND	ND	100,000	100,000	500,000	1,000,000
Benzo(ghi)perylene	2,900 J	ND	29 J	160	ND	60 J	100,000	100,000	500,000	1,000,000
Fluorene	ND	ND	ND	120 J	ND	ND	30,000	100,000	500,000	386,000
Phenanthrene	1,500 J	ND	48 J	760	ND	110 J	100,000	100,000	500,000	1,000,000
Dibenzo(a,h)anthracene	ND	ND	ND	36 J	ND	ND	330	330	560	1,000,000
Indeno(1,2,3-cd)pyrene	**2,700 J**	ND	30 J	170	ND	61 J	500	500	5,600	8,200
Pyrene	4,000 J	ND	60 J	690	ND	90 J	100,000	100,000	500,000	1,000,000
Biphenyl	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	-	-	-	220
2-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibenzofuran	ND	ND	ND	130 J	ND	ND	7,000	-	-	-
2-Methylnaphthalene	ND	ND	ND	84 J	ND	ND	-	-	-	36,400
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	-	-	-	
4-Nitrophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	-	-	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	800	6,700	6,700	800
Phenol	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
2-Methylphenol	ND	ND	ND	ND	ND	ND	330	-	-	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	330	-	-	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	-	-	-	-
Carbazole	ND	ND	ND	98 J	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B3S			B3W			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native				
Sample Date	1/17/19									
Metals in milligrams per kilogram										
Aluminum, Total	2,870	4,210	237	2,120	4,400	1,810	-	-	-	-
Antimony, Total	0.342 J	ND	ND	0.326 J	0.721 J	ND	-	-	-	-
Arsenic, Total	3.04	1.79 J	0.391 J	1.32	4.28	0.805 J	13	16	16	16
Barium, Total	33.2	15.7	2.02	29.2	31.8	21.1	350	400	400	820
Beryllium, Total	0.114 J	0.125 J	ND	0.167 J	0.094 J	0.115 J	7.2	72	590	47
Cadmium, Total	ND	ND	ND	ND	ND	ND	2.5	4.3	9.3	7.5
Calcium, Total	27,100	5,050	140	12,800	3,890	15,900	-	-	-	-
Chromium, Total	5.61	12.4	1.26	6.58	7.60	8.79	30	180	1,500	-
Cobalt, Total	2.37	1.81 J	0.223 J	1.95	4.62	1.66 J	-	-	-	-
Copper, Total	6.05	3.77	ND	4.82	28.5	4.37	50	270	270	1,720
Iron, Total	6,750	4,610	864	5,550	8,010	4,170	-	-	-	-
Lead, Total	12.1	6.64 J	0.866 J	17.3	20.1	8.90	63	400	1,000	450
Magnesium, Total	3,090	1,530	82.3	987	1,550	2,930	-	-	-	-
Manganese, Total	116	53.5	5.45	84.9	46.1	77.0	1,600	2,000	10,000	2,000
Mercury, Total	ND	ND	ND	ND	ND	ND	0.18	0.81	2.8	0.73
Nickel, Total	4.56	5.77	0.335 J	4.26	8.89	3.17 J	30	310	310	130
Potassium, Total	450	870	65.1 J	411	491	276 J	-	-	-	-
Selenium, Total	ND	ND	ND	ND	0.365 J	ND	3.9	180	1,500	4
Silver, Total	ND	ND	ND	ND	ND	ND	2	180	1,500	8.3
Sodium, Total	102 J	207 J	24.2 J	70.9 J	204	108 J	-	-	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
Vanadium, Total	10.1	19.0	1.09	7.28	23.0	6.85	-	-	-	-
Zinc, Total	32.9	17.5	1.70 J	34.8	**116**	19.2	109	10,000	10,000	2,480
Pesticides in micrograms per kilogram										
Delta-BHC	ND	ND	ND	ND	ND	2.15 J	40	100,000	500,000	250
Lindane	ND	ND	ND	ND	ND	ND	100	1,300	9,200	100
Alpha-BHC	ND	ND	ND	ND	ND	ND	20	480	3,400	20
Beta-BHC	ND	ND	ND	ND	ND	ND	36	360	3,000	90
Heptachlor	ND	ND	ND	ND	ND	ND	42	2,100	15,000	380
Aldrin	ND	ND	ND	ND	ND	ND	5	97	680	190
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	-	-	-	20
Endrin	ND	ND	ND	ND	ND	ND	14	11,000	89,000	60
Endrin aldehyde	ND	ND	ND	ND	ND	ND	-	-	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	-	-	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	5	200	1,400	100
4,4'-DDE	ND	ND	0.735 JP	ND	ND	ND	3.3	8,900	62,000	17,000
4,4'-DDD	ND	ND	ND	ND	ND	ND	3.3	13,000	92,000	14,000
4,4'-DDT	ND	ND	ND	ND	ND	ND	3.3	7,900	47,000	136,000
Endosulfan I	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan II	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	1,000,000
Methoxychlor	ND	ND	ND	ND	ND	ND	-	-	-	900,000
Toxaphene	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	94	4,200	24,000	2,900
trans-Chlordane	ND	ND	ND	ND	ND	ND	-	-	-	-
Chlordane	ND	ND	ND	ND	ND	ND	-	-	-	-
Polychlorinated Biphenyls in micrograms per kilogram										
Aroclor 1016	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1221	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1232	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1242	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1248	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1254	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1260	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1262	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1268	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200

Notes:

ND = Not detected.

J = Estimated concentration below the RL but above the MDL.

Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B9A			B9N			B9N DUPLICATE	B9E			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Native	Native	Native	Native	Fill	Fill/Native	Native				
Sample Date	1/4/19			1/17/19										
TCL Volatile Organic Compounds in micrograms per kilogram														
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000	500,000	50
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000	240,00	270
Chloroform	ND	ND	ND	ND	ND	ND	ND	0.18 J	0.31 J	ND	370	49,000	350,000	370
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400	22,000	760
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	19,000	150,000	1,300
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100	30,000	20
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000	500,000	680
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	600
Benzene	ND	ND	ND	ND	ND	ND	ND	0.44 J	0.96	ND	60	4,800	44,000	60
Toluene	1.4	ND	ND	**2,300 J**	**4,200**	**710 J**	ND	3.1	6.0	ND	700	100,000	500,000	700
Ethylbenzene	ND	ND	ND	**2,500**	**26,000**	**5,800**	**2,900**	0.29 J	0.45 J	ND	1,000	41,000	390,000	1,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900	13,000	20
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000	500,000	190
Trichloroethene	0.90	ND	0.21 J	ND	ND	ND	ND	1.6	3.5	ND	470	21,000	200,000	470
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000	280,000	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	0.42 J	ND	0.61 J	1,800	13,000	130,000	1,800
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000	500,000	930
p/m-Xylene	0.94 J	ND	ND	13,000	170,000	19,000	18,000	1.7 J	2.80	ND	-	-	-	-
o-Xylene	ND	ND	ND	9,000	110,000	10,000	12,000	ND	0.60 J	ND	-	-	-	-
Xylenes, Total	0.94 J	ND	ND	**22,000**	**280,000**	**29,000**	**30,000**	1.7 J	3.4 J	ND	260	100,000	500,000	1,600
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	0.35 J	0.62 J	ND	250	100,000	500,000	250
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	0.35 J	0.62 J	ND	-	-	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Styrene	ND	ND	ND	ND	1,300 J	ND	ND	ND	ND	ND	-	-	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetone	10 J	6.4 J	11	ND	ND	ND	ND	34	27	41	50	100,000	500,000	50
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	2,700
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120	100,000	500,000	300
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	300
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Butylbenzene	ND	ND	ND	4,000	**32,000**	1,400	3,400	ND	ND	ND	12,000	100,000.00	500,000	12,000
sec-Butylbenzene	ND	ND	ND	7,100	**58,000**	2,900	6,700	ND	0.24 J	ND	11,000	100,000	500,000	11,000
tert-Butylbenzene	ND	ND	ND	910 J	ND	ND	550 J	ND	ND	ND	5,900	100,000	500,000	5,900
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Isopropylbenzene	ND	ND	ND	**2,800**	**34,000**	**2,400**	**3,300**	ND	ND	ND	2,300	-	-	-
p-Isopropyltoluene	ND	ND	ND	14,000	66,000	3,600	8,200	ND	0.20 J	ND	10,000	-	-	-
Naphthalene	ND	ND	ND	**26,000**	**210,000**	**21,000**	**26,000**	ND	ND	3.1 J	12,000	100,000	500,000	12,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Propylbenzene	ND	ND	ND	**5,300**	**69,000**	**4,200**	**6,500**	ND	ND	ND	3,900	100,000	500,000	3,900
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3,5-Trimethylbenzene	0.32 J	ND	ND	**160,000**	**1,000,000**	**58,000**	**110,000**	ND	1.9 J	ND	8,400	52,000	190,000	8,400
1,2,4-Trimethylbenzene	0.56 J	ND	ND	**290,000**	**1,800,000**	**130,000**	**230,000**	0.35 J	1.6 J	2.4 J	3,600	52,000	190,000	3,600
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000	130,000	100
p-Diethylbenzene	ND	ND	ND	100,000	340,000	17,000	42,000	ND	2.20	ND	-	-	-	-
p-Ethyltoluene	ND	ND	ND	79,000	640,000	34,000	67,000	ND	0.42 J	ND	-	-	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	20,000	71,000	3,600	8,700	ND	0.30 J	0.32 J	-	-	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B9A			B9N			B9N DUPLICATE	B9E			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Native	Native	Native	Native	Fill	Fill/Native	Native				
Sample Date	1/4/19			1/17/19										
TCL Semivolatile Organic Compounds in micrograms per kilogram														
Acenaphthene	ND	ND	ND	4,300	1,100 J	220 J	180 J	ND	ND	ND	20,000	100,000	500,000	98,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	1,200	6,000	1,400
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	100,000	500,000	1,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000	280000	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	13,000	130,000	1,800
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	1,000
Fluoranthene	39 J	ND	48 J	20,000	3,600	1,000	890	22 J	69 J	ND	100,000	100,000	500,000	1,000,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Naphthalene	91 J	ND	ND	**52,000**	**80,000**	10,000	10,000	ND	ND	ND	12,000	100,000	500,000	12,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	15,000	69,000	17,000
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	435,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	8,100
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	120,000
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	27,000
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzo(a)anthracene	29 J	ND	ND	**9,100**	**1,700 J**	480	430	ND	50 J	ND	1,000	1,000	5,600	1,000
Benzo(a)pyrene	ND	ND	ND	**7,100**	**1,100 J**	400	360	ND	49 J	ND	1,000	1,000	1,000	22,000
Benzo(b)fluoranthene	41 J	ND	ND	**9,600**	**1,500 J**	520	480	ND	61 J	ND	1,000	1,000	5,600	1,700
Benzo(k)fluoranthene	ND	ND	ND	**2,400 J**	ND	160 J	130 J	ND	ND	ND	800	3,900	56,000	1,700
Chrysene	48 J	ND	ND	**8,100**	**1,400 J**	440	380	21 J	51 J	ND	1,000	3,900	56,000	1,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000	107,000
Anthracene	ND	ND	ND	7,100	1,400 J	350	310	ND	ND	ND	100,000	100,000	500,000	1,000,000
Benzo(ghi)perylene	25 J	ND	ND	4,100	670 J	250 J	210 J	ND	46 J	ND	100,000	100,000	500,000	1,000,000
Fluorene	ND	ND	ND	4,800	1,600 J	290 J	260 J	ND	ND	ND	30,000	100,000	500,000	386,000
Phenanthrene	42 J	ND	63 J	21,000	4,500	1,100	960	ND	37 J	ND	100,000	100,000	500,000	1,000,000
Dibenzo(a,h)anthracene	ND	ND	ND	**1,200 J**	ND	64 J	55 J	ND	ND	ND	330	330	560	1,000,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	**4,500**	**720 J**	250 J	220 J	ND	39 J	ND	500	500	5,600	8,200
Pyrene	41 J	ND	33 J	21,000	3,700	1,100	980	25 J	73 J	ND	100,000	100,000	500,000	1,000,000
Biphenyl	ND	56 J	ND	3,300 J	3,700 J	550 J	480 J	ND	ND	ND	-	-	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	220
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibenzofuran	ND	ND	ND	2,900 J	710 J	120 J	100 J	ND	ND	ND	7,000	59,000	350,000	-
2-Methylnaphthalene	ND	ND	ND	28,000	**44,000**	6,000	5,500	ND	ND	ND	-	-	-	36,400
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetophenone	30 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dimethylphenol	ND	ND	ND	8,600	6,900	12,000	7,600	ND	ND	ND	-	-	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700	6,700	800
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
2-Methylphenol	46 J	ND	ND	ND	ND	**880**	**680**	ND	ND	ND	330	100,000	500,000	-
3-Methylphenol/4-Methylphenol	190 J	ND	ND	**8,700**	**5,300 J**	**3,500**	**2,600**	ND	ND	ND	330	100,000	500,000	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Carbazole	ND	ND	ND	1,900 J	ND	ND	ND	ND	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B9A			B9N			B9N DUPLICATE	B9E			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Native	Native	Native	Native	Fill	Fill/Native	Native				
Sample Date	1/4/19			1/17/19										
Metals in milligrams per kilogram														
Aluminum, Total	419	124	202	1,700	203	405	881	791	684	384	-	-	-	-
Antimony, Total	ND	ND	ND	0.432 J	ND	ND	ND	ND	ND	ND	-	-	-	-
Arsenic, Total	1.70	0.387 J	0.546 J	2.22	1.90	1.15	1.12	1.83	1.03	1.17 J	13	16	16	16
Barium, Total	9.17	2.13	3.82	20.0	5.24	5.18	7.76	10.6	10.5	3.5	350	400	400	820
Beryllium, Total	ND	ND	ND	0.165 J	ND	ND	0.039 J	0.048 J	0.037 J	ND	7.2	72	590	47
Cadmium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.5	4.3	9.3	7.5
Calcium, Total	534	87.4	223	1,090	88.4	1,080	2,710	1,570	2,620	193	-	-	-	-
Chromium, Total	2.73	1.22	4.44	7.34	4.20	3.23	4.63	3.73	4.38	2.07	30	180	1,500	-
Cobalt, Total	0.699 J	0.189 J	0.386 J	2.22	2.87	1.20 J	1.48 J	1.22 J	0.748 J	0.377 J	-	-	-	-
Copper, Total	6.60	ND	0.508 J	29.9	1.21	1.37	2.53	7.40	3.16	ND	50	270	270	1,720
Iron, Total	950	310	724	2,350	796	1,280	1,680	9,670	1,560	1,200	-	-	-	-
Lead, Total	13.0	1.05 J	1.77 J	**83.4**	3.70 J	3.46 J	5.03	8.52	8.16	1.22 J	63	400	1,000	450
Magnesium, Total	78.8	37.6	59.0	291	51	157	443	348	361	166	-	-	-	-
Manganese, Total	7.13	4.23	10.0	10.5	12.4	11.9	19.3	46.2	40.8	8.23	1,600	2,000	10,000	2,000
Mercury, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.18	0.81	2.8	0.73
Nickel, Total	1.69 J	ND	0.377 J	6.17	1.87 J	1.23 J	2.09 J	2.57	1.22 J	0.489 J	30	310	310	130
Potassium, Total	54.6 J	21.6 J	33.4 J	81.0 J	26.7 J	71.3 J	151 J	63.8 J	118 J	109 J	-	-	-	-
Selenium, Total	ND	ND	ND	0.731 J	ND	ND	ND	ND	ND	ND	3.9	180	1,500	4
Silver, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	180	1,500	8.3
Sodium, Total	61.1 J	64.6 J	77.3 J	80.0 J	39.2	158 J	219	28.3 J	40.2 J	237 J	-	-	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Vanadium, Total	3.68	1.24	2.32	11.5	4.94	2.91	4.90	3.61	3.81	2.19	-	-	-	-
Zinc, Total	14.1	0.604 J	5.04	**208**	**178**	**125**	**122**	38	24	1.82 J	109	10,000	10,000	2,480
Pesticides in micrograms per kilogram														
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000	500,000	250
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300	9,200	100
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480	3,400	20
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360	3,000	90
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100	15,000	380
Aldrin	ND	ND	ND	ND	ND	1.59 JIP	1.08 JIP	ND	ND	ND	5	97	680	190
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	20
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000	89,000	60
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	200	1,400	100
4,4'-DDE	ND	ND	ND	**11.2 IP**	ND	**6.24**	**5.12**	ND	ND	ND	3.3	8,900	62,000	17,000
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	13,000	92,000	14,000
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	7,900	47,000	136,000
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	1,000,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	900,000
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	94	4,200	24,000	2,900
trans-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Polychlorinated Biphenyls in micrograms per kilogram														
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	13.8 J	ND	100	1,000	1,000	3,200
Aroclor 1260	ND	ND	ND	**1,070**	ND	75.3	**146**	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1262	ND	ND	ND	ND	**519**	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200

Notes:

ND = Not detected.
J = Estimated concentration
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B9S			B9W			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6				
Sample Type	Native	Native	Native	Native	Native	Native				
Sample Date	1/17/19			1/4/19						
TCL Volatile Organic Compounds in micrograms per kilogram										
Methylene chloride	ND	ND	ND	ND	ND	ND	50	100,000	500,000	50
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	270	26,000	240,00	270
Chloroform	0.99 J	ND	ND	ND	ND	ND	370	49,000	350,000	370
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	760	2,400	22,000	760
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	1,300	19,000	150,000	1,300
Chlorobenzene	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	20	3,100	30,000	20
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	680	100,000	500,000	680
Bromodichloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromoform	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	-	-	-	600
Benzene	ND	ND	ND	ND	ND	ND	60	4,800	44,000	60
Toluene	0.87 J	ND	ND	ND	ND	ND	700	100,000	500,000	700
Ethylbenzene	ND	ND	0.14 J	ND	ND	ND	1,000	41,000	390,000	1,000
Chloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromomethane	1 J	ND	ND	ND	ND	ND	-	-	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	20	900	13,000	20
Chloroethane	ND	ND	ND	ND	ND	ND	-	-	-	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	190	100,000	500,000	190
Trichloroethene	0.75 J	ND	ND	ND	ND	ND	470	21,000	200,000	470
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	2,400	49,000	280,000	2,400
1,4-Dichlorobenzene	0.56 J	0.43 J	ND	ND	ND	ND	1,800	13,000	130,000	1,800
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	930	100,000	500,000	930
p/m-Xylene	ND	ND	ND	ND	ND	ND	-	-	-	-
o-Xylene	ND	ND	ND	ND	ND	ND	-	-	-	-
Xylenes, Total	ND	ND	ND	ND	ND	ND	260	100,000	500,000	1,600
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	250	100,000	500,000	250
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Styrene	ND	ND	ND	ND	ND	ND	-	-	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetone	20	14	11	ND	8.3 J	10	50	100,000	500,000	50
Carbon disulfide	ND	ND	ND	ND	ND	ND	-	-	-	2,700
2-Butanone	ND	ND	ND	ND	ND	ND	120	100,000	500,000	300
Vinyl acetate	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	-	-	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-	300
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	12,000	100,000.00	500,000	12,000
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	11,000	100,000	500,000	11,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	5,900	100,000	500,000	5,900
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	-	-	-	-
Isopropylbenzene	ND	ND	ND	ND	ND	ND	2,300	-	-	-
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	10,000	-	-	-
Naphthalene	ND	ND	ND	ND	ND	ND	12,000	100,000	500,000	12,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	3,900	100,000	500,000	3,900
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	8,400	52,000	190,000	8,400
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	3,600	52,000	190,000	3,600
1,4-Dioxane	ND	ND	ND	ND	ND	ND	100	13,000	130,000	100
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Ethyltoluene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.

FPM

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B9S			B9W			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	2-4	0-2	2-4	2-4				
Sample Type	Native	Native	Native	Native	Native	Native				
Sample Date	1/17/19			1/4/19						
TCL Semivolatile Organic Compounds in micrograms per kilogram										
Acenaphthene	ND	ND	ND	ND	ND	ND	20,000	100,000	500,000	98,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	330	1,200	6,000	1,400
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,000	100,000	500,000	1,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	2,400	49,000	280000	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,800	13,000	130,000	1,800
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	-	-	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	-	-	-	1,000
Fluoranthene	56 J	ND	ND	110 J	ND	ND	100,000	100,000	500,000	1,000,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	-	-	-	-
Isophorone	ND	ND	ND	ND	ND	ND	-	-	-	-
Naphthalene	78 J	ND	ND	47 J	ND	ND	12,000	100,000	500,000	12,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	-	15,000	69,000	17,000
NDPA/DPA	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	-	-	-	435,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	-	-	-	8,100
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	-	-	-	120,000
Diethyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-	27,000
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzo(a)anthracene	68 J	ND	ND	83 J	ND	ND	1,000	1,000	5,600	1,000
Benzo(a)pyrene	ND	ND	ND	63 J	ND	ND	1,000	1,000	1,000	22,000
Benzo(b)fluoranthene	79 J	ND	ND	99 J	ND	ND	1,000	1,000	5,600	1,700
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	800	3,900	56,000	1,700
Chrysene	130	ND	ND	130	ND	ND	1,000	3,900	56,000	1,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000	107,000
Anthracene	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000	1,000,000
Benzo(ghi)perylene	37 J	ND	ND	59 J	ND	ND	100,000	100,000	500,000	1,000,000
Fluorene	ND	ND	ND	ND	ND	ND	30,000	100,000	500,000	386,000
Phenanthrene	99 J	ND	ND	140	ND	ND	100,000	100,000	500,000	1,000,000
Dibenzo(a,h)anthracene	ND	ND	ND	24 J	ND	ND	330	330	560	1,000,000
Indeno(1,2,3-cd)pyrene	ND	ND	ND	53 J	ND	ND	500	500	5,600	8,200
Pyrene	65 J	ND	ND	110 J	ND	ND	100,000	100,000	500,000	1,000,000
Biphenyl	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	-	-	-	220
2-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibenzofuran	ND	ND	ND	ND	ND	ND	7,000	59,000	350,000	-
2-Methylnaphthalene	55 J	ND	ND	60 J	ND	ND	-	-	-	36,400
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetophenone	37 J	ND	ND	ND	ND	ND	-	-	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	-	-	-	
4-Nitrophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	-	-	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	800	6,700	6,700	800
Phenol	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
2-Methylphenol	ND	ND	ND	ND	ND	ND	330	100,000	500,000	-
3-Methylphenol/4-Methylphenol	54 J	ND	ND	120 J	ND	ND	330	100,000	500,000	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	-	-	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	-	-	-	-
Carbazole	ND	ND	ND	ND	ND	ND	-	-	-	-

Notes:

ND = Not detected.

J = Estimated concentration below the RL but above the MDL.

FPM

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B9S			B9W			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6				
Sample Type	Native	Native	Native	Native	Native	Native				
Sample Date	1/17/19			1/4/19						
Metals in milligrams per kilogram										
Aluminum, Total	1,090	156	184	597	155	174	-	-	-	-
Antimony, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
Arsenic, Total	7.46	0.447 J	ND	1.60	0.371 J	0.421 J	13	16	16	16
Barium, Total	32.5	3.70	3.11	12.5	4.65	4.13	350	400	400	820
Beryllium, Total	0.325 J	ND	ND	ND	ND	ND	7.2	72	590	47
Cadmium, Total	ND	ND	ND	0.137 J	ND	ND	2.5	4.3	9.3	7.5
Calcium, Total	2,460	116	279	1,260	133	160	-	-	-	-
Chromium, Total	6.33	1.94	2.71	3.73	1.84	2.63	30	180	1,500	-
Cobalt, Total	2.26	0.311 J	0.241 J	0.685 J	0.276 J	0.297 J	-	-	-	-
Copper, Total	20.5	ND	0.309 J	14.4	0.247	ND	50	270	270	1,720
Iron, Total	3,200	501	536	1,120	508	574	-	-	-	-
Lead, Total	29.0	2.30 J	1.86 J	61.6	1.74 J	1.68 J	63	400	1,000	450
Magnesium, Total	220	60.1	68.8	225	47.3	61.4	-	-	-	-
Manganese, Total	20.0	6.70	6.73	10.6	7.08	8.70	1,600	2,000	10,000	2,000
Mercury, Total	0.091 J	ND	ND	0.047 J	ND	ND	0.18	0.81	2.8	0.73
Nickel, Total	5.29	0.253 J	0.290 J	4.36	ND	ND	30	310	310	130
Potassium, Total	115 J	39.9 J	52.4 J	68.7 J	30.6 J	31.8 J	-	-	-	-
Selenium, Total	ND	ND	ND	0.519 J	ND	ND	3.9	180	1,500	4
Silver, Total	ND	ND	ND	ND	ND	ND	2	180	1,500	8.3
Sodium, Total	97.2 J	120 J	155 J	98.2 J	74.2 J	112 J	-	-	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
Vanadium, Total	6.33	1.86	1.59	3.79	2.12	1.99	-	-	-	-
Zinc, Total	30.6	3.77 J	3.98 J	54.5	9.48	6.12	109	10,000	10,000	2,480
Pesticides in micrograms per kilogram										
Delta-BHC	ND	ND	ND	ND	ND	ND	40	100,000	500,000	250
Lindane	ND	ND	ND	ND	ND	ND	100	1,300	9,200	100
Alpha-BHC	ND	ND	ND	ND	ND	ND	20	480	3,400	20
Beta-BHC	ND	ND	ND	ND	ND	ND	36	360	3,000	90
Heptachlor	ND	ND	ND	ND	ND	ND	42	2,100	15,000	380
Aldrin	ND	ND	ND	ND	ND	ND	5	97	680	190
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	-	-	-	20
Endrin	ND	ND	ND	ND	ND	ND	14	11,000	89,000	60
Endrin aldehyde	ND	ND	ND	ND	ND	ND	-	-	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	-	-	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	5	200	1,400	100
4,4'-DDE	ND	ND	ND	ND	ND	ND	3.3	8,900	62,000	17,000
4,4'-DDD	ND	ND	ND	ND	ND	ND	3.3	13,000	92,000	14,000
4,4'-DDT	ND	ND	ND	ND	ND	ND	3.3	7,900	47,000	136,000
Endosulfan I	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan II	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	1,000,000
Methoxychlor	ND	ND	ND	ND	ND	ND	-	-	-	900,000
Toxaphene	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	94	4,200	24,000	2,900
trans-Chlordane	ND	ND	ND	ND	ND	ND	-	-	-	-
Chlordane	ND	ND	ND	ND	ND	ND	-	-	-	-
Polychlorinated Biphenyls in micrograms per kilogram										
Aroclor 1016	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1221	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1232	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1242	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1248	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1254	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1260	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1262	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1268	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200

Notes:

ND = Not detected.
J = Estimated concentration
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B10			B11			B12			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6	0-2	2-4	4-6				
Sampe Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native	Fill	Fill/Native	Native				
Sample Date	1/17/19			1/4/19			1/17/19						
TCL Volatile Organic Compounds in micrograms per kilogram													
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000	500,000	50
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000	240,00	270
Chloroform	ND	ND	ND	0.91 J	0.20 J	2.4	ND	ND	ND	370	49,000	350,000	370
Carbon tetrachloride	ND	ND	ND	0.57 J	ND	0.58 J	ND	ND	ND	760	2,400	22,000	760
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	19,000	150,000	1,300
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100	30,000	20
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000	500,000	680
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	600
Benzene	29 J	ND	ND	ND	ND	ND	ND	ND	ND	60	4,800	44,000	60
Toluene	520	ND	0.73 J	ND	0.79 J	ND	ND	ND	ND	700	100,000	500,000	700
Ethylbenzene	110	31 J	ND	ND	ND	ND	ND	ND	ND	1,000	41,000	390,000	1,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900	13,000	20
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000	330
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000	500,000	190
Trichloroethene	ND	ND	ND	0.59	0.53 J	0.84	ND	ND	ND	470	21,000	200,000	470
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000	280,000	2,400
1,4-Dichlorobenzene	39 J	30 J	0.21 J	ND	ND	ND	ND	0.68 J	1.2 J	1,800	13,000	130,000	1,800
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000	500,000	930
p/m-Xylene	690	150	0.64 J	ND	ND	ND	ND	ND	ND	-	-	-	-
o-Xylene	120	23 J	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Xylenes, Total	810	170 J	0.64 J	ND	ND	ND	ND	ND	ND	260	100,000	500,000	1,600
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	250	100,000	500,000	250
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Acetone	ND	ND	**54**	9.1 J	26	33	**100**	20	6.8 J	50	100,000	500,000	50
Carbon disulfide	ND	ND	ND	ND	9.7 J	ND	ND	ND	ND	-	-	-	2,700
2-Butanone	ND	ND	3.5 J	ND	ND	ND	14 J	ND	ND	120	100,000	500,000	300
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	300
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Butylbenzene	ND	24 J	ND	ND	ND	ND	ND	0.27 J	ND	12,000	100,000.00	500,000	12,000
sec-Butylbenzene	ND	33 J	ND	ND	0.18 J	ND	ND	0.57 J	ND	11,000	100,000	500,000	11,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000	500,000	5,900
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Isopropylbenzene	ND	18 J	ND	ND	ND	ND	ND	ND	ND	2,300	-	-	-
p-Isopropyltoluene	18 J	15 J	ND	ND	ND	ND	ND	ND	ND	10,000	-	-	-
Naphthalene	ND	120 J	ND	ND	ND	ND	ND	17	ND	12,000	100,000	500,000	12,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
n-Propylbenzene	ND	42 J	ND	ND	ND	ND	ND	ND	ND	3,900	100,000	500,000	3,900
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,3,5-Trimethylbenzene	110 J	81 J	ND	ND	ND	ND	ND	ND	ND	8,400	52,000	190,000	8,400
1,2,4-Trimethylbenzene	140 J	270	ND	ND	ND	ND	ND	5.8	ND	3,600	52,000	190,000	3,600
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000	130,000	100
p-Diethylbenzene	84 J	38 J	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
p-Ethyltoluene	58 J	54 J	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
1,2,4,5-Tetramethylbenzene	17 J	26 J	ND	ND	ND	ND	ND	1.2 J	ND	-	-	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B10			B11			B12			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6	0-2	2-4	4-6			
Sampe Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native	Fill	Fill/Native	Native			
Sample Date	1/17/19			1/4/19			1/17/19					
TCL Semivolatile Organic Compounds in micrograms per kilogram												
Acenaphthene	22 J	ND	ND	ND	ND	ND	ND	ND	ND	20,000	100,000	500,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	1,200	6,000
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	100,000	500,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000	280000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	59 J	ND	ND	1,800	13,000	130,000
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Fluoranthene	440	ND	280 J	ND	120	ND	66 J	ND	ND	100,000	100,000	500,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Naphthalene	120 J	34 J	ND	ND	ND	ND	88 J	ND	ND	12,000	100,000	500,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	15,000	69,000
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Di-n-butylphthalate	180 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Benzo(a)anthracene	260	ND	ND	ND	49 J	ND	67 J	ND	ND	1,000	1,000	5,600
Benzo(a)pyrene	200	ND	ND	ND	ND	ND	ND	ND	ND	1,000	1,000	1,000
Benzo(b)fluoranthene	260	ND	ND	ND	50 J	ND	95 J	ND	ND	1,000	1,000	5,600
Benzo(k)fluoranthene	93 J	ND	ND	ND	ND	ND	ND	ND	ND	800	3,900	56,000
Chrysene	250	ND	ND	ND	42 J	22 J	160	ND	ND	1,000	3,900	56,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000
Anthracene	83 J	ND	ND	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000
Benzo(ghi)perylene	130 J	ND	230 J	ND	28 J	ND	52 J	ND	ND	100,000	100,000	500,000
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	30,000	100,000	500,000
Phenanthrene	400	ND	ND	ND	110 J	ND	170	ND	ND	100,000	100,000	500,000
Dibenzo(a,h)anthracene	37 J	ND	ND	ND	ND	ND	ND	ND	ND	330	330	560
Indeno(1,2,3-cd)pyrene	140 J	ND	ND	ND	ND	ND	ND	ND	ND	500	500	5,600
Pyrene	370	ND	330 J	ND	94 J	24 J	93 J	ND	ND	100,000	100,000	500,000
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Dibenzofuran	39 J	ND	ND	ND	ND	ND	ND	ND	ND	7,000	59,000	350,000
2-Methylnaphthalene	63 J	ND	ND	ND	ND	ND	85 J	ND	ND	-	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Acetophenone	560	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700	6,700
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000
3-Methylphenol/4-Methylphenol	50 J	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000	500,000
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
Carbazole	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B10			B11			B12			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6	0-2	2-4	4-6				
Sampe Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native	Fill	Fill/Native	Native				
Sample Date	1/17/19			1/4/19			1/17/19						
Metals in milligrams per kilogram													
Aluminum, Total	1,720	242	806	3,090	456	1,730	909	151	162	-	-	-	-
Antimony, Total	ND	ND	ND	ND	ND	ND	2.68 J	ND	ND	-	-	-	-
Arsenic, Total	2.54	1.31	1.14	0.317 J	0.241 J	2.34	5.12	0.399 J	0.371 J	13	16	16	16
Barium, Total	39.9	6.42	11.2	20.2	4.83	30.1	25.2	2.26	2.69	350	400	400	820
Beryllium, Total	0.268 J	ND	0.035 J	ND	ND	ND	0.166 J	ND	ND	7.2	72	590	47
Cadmium, Total	0.308 J	ND	ND	0.520 J	ND	0.239 J	ND	ND	ND	2.5	4.3	9.3	7.5
Calcium, Total	1,800	206	5,890	1,640	1,800	9,460	1,340	123	142	-	-	-	-
Chromium, Total	6.30	3.34	4.40	8.37	3.51	9.55	7.33	1.52	1.56	30	180	1,500	-
Cobalt, Total	2.11	0.584 J	0.782 J	3.88	0.55	2.00	2.04 J	0.171 J	0.181 J	-	-	-	-
Copper, Total	24.2	0.938 J	4.63	40.8	2.80	13.9	16.4	0.323 J	ND	50	270	270	1,720
Iron, Total	4,900	1,170	1,650	7,300	1,150	3,810	2,820	498	449	-	-	-	-
Lead, Total	79.0	5.20	10.7	43.9	3.92 J	12.8	43.6	1.28 J	2.26 J	63	400	1,000	450
Magnesium, Total	381	70.2	466	1,550	167	703	180	57.8	66.1	-	-	-	-
Manganese, Total	15.7	12.0	17.8	43.5	11.8	36.9	13.7	3.94	4.76	1,600	2,000	10,000	2,000
Mercury, Total	ND	ND	0.027 J	0.063 J	ND	0.018 J	0.048 J	ND	ND	0.18	0.81	2.8	0.73
Nickel, Total	6.32	0.794 J	1.65 J	6.05	0.835 J	4.09	4.13	ND	ND	30	310	310	130
Potassium, Total	80.3 J	37.2 J	65.1	589	84.4	253	97.5 J	44.5 J	47.6 J	-	-	-	-
Selenium, Total	ND	ND	ND	0.256 J	ND	ND	ND	ND	ND	3.9	180	1,500	4
Silver, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	180	1,500	8.3
Sodium, Total	66.1 J	31.1 J	68.0 J	268	94.6 J	175 J	115 J	108 J	172 J	-	-	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Vanadium, Total	7.16	4.25	3.92	29.4	2.86	8.79	6.01	1.23	1.39	-	-	-	-
Zinc, Total	**169**	36.3	43.1	134	15.7	39.5	35.4	3.12 J	3.73 J	109	10,000	10,000	2,480
Pesticides in micrograms per kilogram													
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000	500,000	250
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300	9,200	100
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480	3,400	20
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360	3,000	90
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100	15,000	380
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97	680	190
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	20
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000	89,000	60
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	200	1,400	100
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	8,900	62,000	17,000
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	13,000	92,000	14,000
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	7,900	47,000	136,000
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	1,000,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	900,000
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-Chlordane	ND	ND	ND	ND	0.84 JP	ND	ND	ND	ND	94	4,200	24,000	2,900
trans-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Polychlorinated Biphenyls in micrograms per kilogram													
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1254	ND	ND	6.6 JP	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200

Notes:

ND = Not detected.
J = Estimated concentration
P = the RPD between the results for the two columns exceeds the method-specific criteria.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B13			B16			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6			
Sample Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native			
Sample Date	1/4/19			1/17/19					
TCL Volatile Organic Compounds in micrograms per kilogram									
Methylene chloride	ND	ND	ND	ND	ND	ND	50	100,000	500,000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	270	26,000	240,00
Chloroform	0.5 J	ND	ND	ND	44 J	0.2 J	370	49,000	350,000
Carbon tetrachloride	ND	ND	ND	33 J	ND	ND	760	2,400	22,000
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	-	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	-	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	1,300	19,000	150,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	20	3,100	30,000
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	680	100,000	500,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	-	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	-	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	-	-	-
Bromoform	ND	ND	ND	ND	ND	ND	-	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	-	-	-
Benzene	ND	ND	ND	33 J	ND	ND	60	4,800	44,000
Toluene	2.6	ND	1.8	190	ND	ND	700	100,000	500,000
Ethylbenzene	ND	ND	0.19 J	64 J	17 J	0.38 J	1,000	41,000	390,000
Chloromethane	ND	ND	ND	ND	ND	ND	-	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	-	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	20	900	13,000
Chloroethane	ND	ND	ND	ND	ND	ND	-	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	330	100,000	500,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	190	100,000	500,000
Trichloroethene	36	0.62	9.5	83	330	0.3 J	470	21,000	200,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,100	100,000	500,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	2,400	49,000	280,000
1,4-Dichlorobenzene	0.23 J	0.28 J	0.24 J	390	60 J	1.3 J	1,800	13,000	130,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	930	100,000	500,000
p/m-Xylene	ND	ND	0.68 J	320	81 J	2.1 J	-	-	-
o-Xylene	ND	ND	ND	130	47 J	1.3	-	-	-
Xylenes, Total	ND	ND	0.68 J	**450**	130 J	3.4 J	260	100,000	500,000
cis-1,2-Dichloroethene	8.4	ND	1.8	ND	89	ND	250	100,000	500,000
1,2-Dichloroethene, Total	8.4	ND	1.8	ND	89	ND	-	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	-	-	-
Styrene	ND	ND	ND	ND	ND	ND	-	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	-	-	-
Acetone	20	26	33	ND	ND	6.5 J	50	100,000	500,000
Carbon disulfide	ND	ND	ND	ND	ND	ND	-	-	-
2-Butanone	ND	ND	3 J	ND	ND	ND	120	100,000	500,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	-	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	-	-	-
1,2,3-Trichloropropane	ND	ND	ND	63 J	ND	ND	-	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	-	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	-	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	-	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	-	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	-	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	-	-	-
n-Butylbenzene	ND	ND	ND	86 J	ND	0.35 J	12,000	100,000.00	500,000
sec-Butylbenzene	ND	ND	ND	130	17 J	0.75 J	11,000	100,000	500,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	5,900	100,000	500,000
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	-	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	-	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	-	-	-
Isopropylbenzene	ND	ND	ND	44 J	13 J	0.31 J	2,300	-	-
p-Isopropyltoluene	ND	ND	ND	190	18 J	0.74 J	10,000	-	-
Naphthalene	ND	ND	13	1,200	64 J	1.9 J	12,000	100,000	500,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	-	-	-
n-Propylbenzene	ND	ND	ND	120	24 J	0.69 J	3,900	100,000	500,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-
1,3,5-Trimethylbenzene	ND	ND	ND	1,900	300	13	8,400	52,000	190,000
1,2,4-Trimethylbenzene	ND	ND	ND	**4,000**	580	26	3,600	52,000	190,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	100	13,000	130,000
p-Diethylbenzene	ND	ND	ND	1,100	86 J	4.5	-	-	-
p-Ethyltoluene	ND	ND	ND	1,200	200	7.3	-	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	230	15 J	0.68 J	-	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	-	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B13			B16			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6			
Sample Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native			
Sample Date	1/4/19			1/17/19					
TCL Semivolatile Organic Compounds in micrograms per kilogram									
Acenaphthene	ND	ND	76 J	100 J	ND	ND	20,000	100,000	500,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	330	1,200	6,000
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	-	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,000	100,000	500,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	2,400	49,000	280000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1,800	13,000	130,000
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	-	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	-	-	-
Fluoranthene	840 J	150 J	350	2,100	ND	57 J	100,000	100,000	500,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	-	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	-	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	-	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	-	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	-	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	-	-	-
Isophorone	ND	ND	ND	ND	ND	ND	-	-	-
Naphthalene	ND	ND	60 J	90 J	ND	ND	12,000	100,000	500,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	-	15,000	69,000
NDPA/DPA	ND	ND	ND	ND	ND	ND	-	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	-	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	-	-	-
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	-	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	-	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	-	-	-
Benzo(a)anthracene	540 J	100 J	150	**1,100**	ND	27 J	1,000	1,000	5,600
Benzo(a)pyrene	ND	ND	120 J	**1,100**	ND	ND	1,000	1,000	1,000
Benzo(b)fluoranthene	580 J	86 J	130 J	**1,300**	ND	ND	1,000	1,000	5,600
Benzo(k)fluoranthene	ND	ND	50 J	460	ND	ND	800	3,900	56,000
Chrysene	810 J	110 J	130 J	890	ND	23 J	1,000	3,900	56,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	100,000	100,000	500,000
Anthracene	ND	ND	130 J	330	ND	ND	100,000	100,000	500,000
Benzo(ghi)perylene	460 J	ND	73 J	840	ND	ND	100,000	100,000	500,000
Fluorene	ND	ND	71 J	83 J	ND	ND	30,000	100,000	500,000
Phenanthrene	530 J	ND	440	1,200	ND	47 J	100,000	100,000	500,000
Dibenzo(a,h)anthracene	ND	ND	ND	160	ND	ND	330	330	560
Indeno(1,2,3-cd)pyrene	340 J	ND	70 J	**800**	ND	ND	500	500	5,600
Pyrene	930 J	150 J	320	1,900	190 J	55 J	100,000	100,000	500,000
Biphenyl	ND	ND	ND	ND	ND	ND	-	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	-	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	-	-	-
Dibenzofuran	ND	ND	48 J	55 J	ND	ND	7,000	59,000	350,000
2-Methylnaphthalene	ND	ND	29 J	39 J	ND	ND	-	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	-	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	-	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	-	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	-	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	-	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	-	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	-	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	-	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	800	6,700	6,700
Phenol	ND	ND	ND	ND	ND	ND	330	100,000	500,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	330	100,000	500,000
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	330	100,000	500,000
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	-	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	-	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	-	-	-
Carbazole	ND	ND	48 J	95 J	ND	ND	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	B13			B16			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	2-4	4-6	0-2	2-4	4-6				
Sample Type	Fill	Fill/Native	Native	Fill	Fill/Native	Native				
Sample Date	1/4/19			1/17/19						
Metals in milligrams per kilogram										
Aluminum, Total	5,570	144	1,740	1,960	5,770	366	-	-	-	-
Antimony, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
Arsenic, Total	0.254 J	0.289 J	0.885 J	1.43	1.55	0.324 J	13	16	16	16
Barium, Total	25.0	1.76	10.6	16.0	25.9	2.10	350	400	400	820
Beryllium, Total	ND	ND	ND	0.117 J	ND	ND	7.2	72	590	47
Cadmium, Total	0.509 J	ND	0.128 J	ND	ND	ND	2.5	4.3	9.3	7.5
Calcium, Total	2,590	86.4	8,780	4,020	3,350	1,220	-	-	-	-
Chromium, Total	7.55	2.07	7.53	4.62	6.08	1.35	30	180	1,500	-
Cobalt, Total	7.58	0.241 J	1.61 J	2.40	8.84	0.491 J	-	-	-	-
Copper, Total	39.5	ND	5.31	6.31	**58.5**	2.14	50	270	270	1,720
Iron, Total	14,900	379	3,210	5,860	14,200	776	-	-	-	-
Lead, Total	7.50	2.74 J	5.88	6.49	12.2	2.95 J	63	400	1,000	450
Magnesium, Total	2,600	25.9	909	851	3,170	654	-	-	-	-
Manganese, Total	83.4	7.74	42.6	82.8	94.7	7.67	1,600	2,000	10,000	2,000
Mercury, Total	ND	ND	ND	ND	ND	ND	0.18	0.81	2.8	0.73
Nickel, Total	13.0	ND	3.09	6.64	12.0	0.677 J	30	310	310	130
Potassium, Total	942	36.5 J	236 J	419	878	77.5 J	-	-	-	-
Selenium, Total	ND	ND	0.416 J	ND	0.515 J	ND	3.9	180	1,500	4
Silver, Total	ND	ND	ND	ND	ND	ND	2	180	1,500	8.3
Sodium, Total	432	14.1 J	175 J	33.8 J	464	34.1 J	-	-	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	-	-	-	-
Vanadium, Total	49.8	1.86	7.58	5.99	59.2	1.89	-	-	-	-
Zinc, Total	36.2	ND	15.5	18.4	47.9	7.60	109	10,000	10,000	2,480
Pesticides in micrograms per kilogram										
Delta-BHC	ND	ND	ND	ND	ND	ND	40	100,000	500,000	250
Lindane	ND	ND	ND	ND	ND	ND	100	1,300	9,200	100
Alpha-BHC	ND	ND	ND	ND	ND	ND	20	480	3,400	20
Beta-BHC	ND	ND	ND	ND	ND	ND	36	360	3,000	90
Heptachlor	ND	ND	ND	ND	ND	ND	42	2,100	15,000	380
Aldrin	ND	ND	ND	ND	ND	ND	5	97	680	190
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	-	-	-	20
Endrin	ND	ND	ND	ND	ND	ND	14	11,000	89,000	60
Endrin aldehyde	ND	ND	ND	ND	ND	ND	-	-	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	-	-	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	5	200	1,400	100
4,4'-DDE	ND	ND	ND	ND	ND	ND	3.3	8,900	62,000	17,000
4,4'-DDD	ND	ND	ND	ND	ND	ND	3.3	13,000	92,000	14,000
4,4'-DDT	ND	ND	ND	ND	ND	ND	3.3	7,900	47,000	136,000
Endosulfan I	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan II	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	2,400	24,000	200,000	1,000,000
Methoxychlor	ND	ND	ND	ND	ND	ND	-	-	-	900,000
Toxaphene	ND	ND	ND	ND	ND	ND	-	-	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	94	4,200	24,000	2,900
trans-Chlordane	ND	ND	ND	ND	ND	ND	-	-	-	-
Chlordane	ND	ND	ND	ND	ND	ND	-	-	-	-
Polychlorinated Biphenyls in micrograms per kilogram										
Aroclor 1016	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1221	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1232	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1242	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1248	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1254	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1260	ND	ND	ND	8.15 J	ND	ND	100	1,000	1,000	3,200
Aroclor 1262	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1268	ND	ND	ND	ND	ND	ND	100	1,000	1,000	3,200

Notes:

ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	CB-1	CB-2	CB-4	CB-4 DUPLICATE	CB-5	6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	0-2	0-2	0-2	0-2				
Sample Type	Sediment	Sediment	Sediment	Sediment	Sediment				
Sample Date	1/17/19								
TCL Volatile Organic Compounds in micrograms per kilogram									
Methylene chloride	ND	ND	ND	ND	ND	50	100,000	500,000	50
1,1-Dichloroethane	ND	ND	ND	ND	ND	270	26,000	240,00	270
Chloroform	ND	1.4 J	ND	ND	ND	370	49,000	350,000	370
Carbon tetrachloride	ND	ND	ND	ND	ND	760	2,400	22,000	760
1,2-Dichloropropane	ND	ND	ND	ND	ND	-	-	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	-	-	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	-	-	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	1,300	19,000	150,000	1,300
Chlorobenzene	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
Trichlorofluoromethane	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	20	3,100	30,000	20
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	680	100,000	500,000	680
Bromodichloromethane	ND	ND	ND	ND	ND	-	-	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	-	-	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	-	-	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	-	-	-	-
Bromoform	ND	ND	ND	ND	ND	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	-	-	-	600
Benzene	ND	0.17 J	ND	ND	ND	60	4,800	44,000	60
Toluene	56 J	0.93 J	**80,000**	**52,000**	ND	700	100,000	500,000	700
Ethylbenzene	ND	ND	**110,000**	**70,000**	0.64 J	1,000	41,000	390,000	1,000
Chloromethane	ND	ND	ND	ND	ND	-	-	-	-
Bromomethane	ND	ND	ND	ND	ND	-	-	-	-
Vinyl chloride	ND	2.3	ND	ND	ND	20	900	13,000	20
Chloroethane	ND	ND	ND	ND	ND	-	-	-	
1,1-Dichloroethene	ND	ND	ND	ND	ND	330	100,000	500,000	330
trans-1,2-Dichloroethene	ND	1.8	ND	ND	ND	190	100,000	500,000	190
Trichloroethene	69	6.6	**36,000**	**27,000**	ND	470	21,000	200,000	470
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	1,100	100,000	500,000	1,100
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	2,400	49,000	280,000	2,400
1,4-Dichlorobenzene	280	4.5	ND	ND	ND	1,800	13,000	130,000	1,800
Methyl tert butyl ether	ND	ND	ND	ND	ND	930	100,000	500,000	930
p/m-Xylene	ND	1.2 J	1,000,000	620,000	5.4	-	-	-	-
o-Xylene	ND	ND	760,000	450,000	4.4	-	-	-	-
Xylenes, Total	ND	1.2 J	**1,800,000**	**1,100,000**	9.8	260	100,000	500,000	1,600
cis-1,2-Dichloroethene	25 J	5.2	ND	ND	ND	250	100,000	500,000	250
1,2-Dichloroethene, Total	25 J	7.0	ND	ND	ND	-	-	-	-
Dibromomethane	ND	ND	ND	ND	ND	-	-	-	-
Styrene	ND	ND	35,000	18,000	ND	-	-	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	-	-	-	-
Acetone	ND	**97**	ND	ND	13	50	100,000	500,000	50
Carbon disulfide	ND	8.7 J	ND	ND	ND	-	-	-	2,700
2-Butanone	ND	15	ND	ND	ND	120	100,000	500,000	300
Vinyl acetate	ND	ND	ND	ND	ND	-	-	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	-	-	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	-	-	-	-
2-Hexanone	ND	ND	ND	ND	ND	-	-	-	-
Bromochloromethane	ND	ND	ND	ND	ND	-	-	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	-	-	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	-	-	-	300
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	-	-	-	-
Bromobenzene	ND	ND	ND	ND	ND	-	-	-	-
n-Butylbenzene	ND	ND	**22,000**	**13,000**	0.54 J	12,000	100,000.00	500,000	12,000
sec-Butylbenzene	ND	0.31 J	**47,000**	**28,000**	1.1 J	11,000	100,000	500,000	11,000
tert-Butylbenzene	ND	0.58 J	5,200 J	3,000	ND	5,900	100,000	500,000	5,900
o-Chlorotoluene	ND	ND	ND	ND	ND	-	-	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	-	-	-	-
Isopropylbenzene	ND	ND	**48,000**	**28,000**	0.55 J	2,300	-	-	-
p-Isopropyltoluene	ND	0.19 J	**46,000**	**27,000**	1.1 J	10,000	-	-	-
Naphthalene	900	3.3 J	**490,000**	**380,000**	11	12,000	100,000	500,000	12,000
Acrylonitrile	ND	ND	ND	ND	ND	-	-	-	-
n-Propylbenzene	ND	ND	**100,000**	**63,000**	1.2 J	3,900	100,000	500,000	3,900
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	-	-	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	-	-	-	-
1,3,5-Trimethylbenzene	ND	0.36 J	**1,300,000**	**780,000**	22	8,400	52,000	190,000	8,400
1,2,4-Trimethylbenzene	ND	0.81 J	**3,400,000**	**2,000,000**	46	3,600	52,000	190,000	3,600
1,4-Dioxane	ND	ND	ND	ND	ND	100	13,000	130,000	100
p-Diethylbenzene	ND	0.68 J	260,000	160,000	7.9	-	-	-	-
p-Ethyltoluene	ND	0.58 J	970,000	570,000	11	-	-	-	-
1,2,4,5-Tetramethylbenzene	ND	0.32 J	49,000	31,000	1.5 J	-	-	-	-
Ethyl ether	ND	ND	ND	ND	ND	-	-	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	CB-1	CB-2	CB-4	CB-4 DUPLICATE	CB-5	6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	0-2	0-2	0-2	0-2				
Sample Type	Sediment	Sediment	Sediment	Sediment	Sediment				
Sample Date	1/17/19								
TCL Semivolatile Organic Compounds in micrograms per kilogram									
Acenaphthene	8,600	2,500	**30,000**	6,600	12,000	20,000	100,000	500,000	98,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	330	1,200	6,000	1,400
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	-	-	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	-	-	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	1,000	100,000	500,000	1,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	2,400	49,000	280000	2,400
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	1,800	13,000	130,000	1,800
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	-	-	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	-	-	-	1,000
Fluoranthene	74,000	32,000	**190,000**	41,000	**150,000**	100,000	100,000	500,000	1,000,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	-	-	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	-	-	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	-	-	-	-
Hexachloroethane	ND	ND	ND	ND	ND	-	-	-	-
Isophorone	ND	ND	ND	ND	ND	-	-	-	-
Naphthalene	6,600	1,100 J	**130,000**	**120,000**	4,200	12,000	100,000	500,000	12,000
Nitrobenzene	ND	ND	ND	ND	ND	-	15,000	69,000	17,000
NDPA/DPA	ND	ND	ND	ND	ND	-	-	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	-	-	-	-
Bis(2-ethylhexyl)phthalate	2600	1,500 J	140,000	84,000	8,000	-	-	-	435,000
Butyl benzyl phthalate	ND	ND	ND	ND	ND	-	-	-	-
Di-n-butylphthalate	500 J	1,500 J	3,800 J	2,000 J	5,600	-	-	-	8,100
Di-n-octylphthalate	ND	ND	6,300 J	ND	ND	-	-	-	120,000
Diethyl phthalate	ND	ND	ND	ND	ND	-	-	-	27,000
Dimethyl phthalate	ND	ND	ND	ND	ND	-	-	-	-
Benzo(a)anthracene	**35,000**	**15,000**	**80,000**	**21,000**	**64,000**	1,000	1,000	5,600	1,000
Benzo(a)pyrene	**32,000**	**12,000**	**81,000**	**18,000**	**68,000**	1,000	1,000	1,000	22,000
Benzo(b)fluoranthene	**43,000**	**15,000**	**100,000**	**25,000**	**100,000**	1,000	1,000	5,600	1,700
Benzo(k)fluoranthene	**11,000**	**6,300**	**38,000**	**6,800**	**29,000**	800	3,900	56,000	1,700
Chrysene	**31,000**	**12,000**	**80,000**	**19,000**	**66,000**	1,000	3,900	56,000	1,000
Acenaphthylene	1,700 J	870 J	4,800 J	ND	2,600	100,000	100,000	500,000	107,000
Anthracene	17,000	6,200	39,000	8,500	20,000	100,000	100,000	500,000	1,000,000
Benzo(ghi)perylene	19,000	7,000	47,000	12,000	44,000	100,000	100,000	500,000	1,000,000
Fluorene	8,400	2,700	25,000	6,400	8,000	30,000	100,000	500,000	386,000
Phenanthrene	61,000	21,000	**160,000**	40,000	91,000	100,000	100,000	500,000	1,000,000
Dibenzo(a,h)anthracene	**5,200**	**2,000**	**13,000**	**2,800 J**	**11,000**	330	330	560	1,000,000
Indeno(1,2,3-cd)pyrene	**21,000**	**7,800**	**51,000**	**12,000**	**48,000**	500	500	5,600	8,200
Pyrene	62,000	27,000	**150,000**	36,000	**130,000**	100,000	100,000	500,000	1,000,000
Biphenyl	700	ND	4,000 J	ND	620 J	-	-	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	-	-	-	220
2-Nitroaniline	ND	ND	ND	ND	ND	-	-	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	-	-	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	-	-	-	-
Dibenzofuran	5,300	1,500 J	**14,000**	3,600 J	5,000	7,000	59,000	350,000	-
2-Methylnaphthalene	2,300 J	530 J	**41,000**	**48,000**	1,600 J	-	-	-	36,400
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	-	-	-	-
Acetophenone	ND	ND	ND	ND	420 J	-	-	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	-	-	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	-	-	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dimethylphenol	ND	ND	420,000	420,000	ND	-	-	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	-	-	-	
4-Nitrophenol	ND	ND	ND	ND	ND	-	-	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	-	-	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	-	-	-	-
Pentachlorophenol	ND	ND	**4,900 J**	ND	ND	800	6,700	6,700	800
Phenol	ND	ND	**1,700 J**	ND	ND	330	100,000	500,000	330
2-Methylphenol	ND	ND	**25,000**	**19,000**	ND	330	100,000	500,000	-
3-Methylphenol/4-Methylphenol	ND	ND	**110,000**	**86,000**	ND	330	100,000	500,000	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	-	-	-	-
Benzoic Acid	ND	ND	ND	ND	ND	-	-	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	-	-	-	-
Carbazole	8,800	2,800	21,000	4,300 J	14,000	-	-	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

TABLE 4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Sample No.	CB-1	CB-2	CB-4	CB-4 DUPLICATE	CB-5	6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives	6 NYCRR Part 375 Commercial Use Soil Cleanup Objectives	6 NYCRR Part 375/CP-51 Protection of Groundwater
Sample Depth (feet)	0-2	0-2	0-2	0-2	0-2				
Sample Type	Sediment	Sediment	Sediment	Sediment	Sediment				
Sample Date	1/17/19								
Metals in milligrams per kilogram									
Aluminum, Total	3,990	2,860	1,490	1,520	11,000	-	-	-	-
Antimony, Total	5.94	3.73 J	9.13	9.59	9.79	-	-	-	-
Arsenic, Total	5.04	5.82	3.79	5.03	**13.6**	13	16	16	16
Barium, Total	**435**	103	**373**	**572**	**724**	350	400	400	820
Beryllium, Total	0.315 J	0.248 J	0.081 J	0.145 J	0.658	7.2	72	590	47
Cadmium, Total	**3.90**	1.83	**4.31**	**7.15**	**6.31**	2.5	4.3	9.3	7.5
Calcium, Total	23,300	5,140	5,620	21,100	32,700	-	-	-	-
Chromium, Total	**45.0**	**38.2**	**326**	**554**	**73.0**	30	180	1,500	-
Cobalt, Total	5.88	5.08	3.60	3.99	11.5	-	-	-	-
Copper, Total	**136**	**98.4**	**177**	**168**	**299**	50	270	270	1,720
Iron, Total	31,100	25,700	20,800	30,300	67,300	-	-	-	-
Lead, Total	**359**	**197**	**1,280**	**984**	**685**	63	400	1,000	450
Magnesium, Total	7,040	2,360	4,310	51,400	7,440	-	-	-	-
Manganese, Total	316	118	99.0	170.0	774	1,600	2,000	10,000	2,000
Mercury, Total	**2.07**	**0.357**	**1.35**	**0.581**	**1.34**	0.18	0.81	2.8	0.73
Nickel, Total	24.5	**120**	17.2	16.3	**67.4**	30	310	310	130
Potassium, Total	362	292	136 J	142 J	736	-	-	-	-
Selenium, Total	1.77 J	0.974	0.993 J	2.27 J	3.08	3.9	180	1,500	4
Silver, Total	ND	ND	0.416 J	0.423 J	ND	2	180	1,500	8.3
Sodium, Total	220	188	188 J	219 J	702	-	-	-	-
Thallium, Total	ND	ND	ND	ND	0.420 J	-	-	-	-
Vanadium, Total	23.3	18.3	39.3	57.9	24.5	-	-	-	-
Zinc, Total	**1,050**	**552**	**1,050**	**1,550**	**1,670**	109	10,000	10,000	2,480
Pesticides in micrograms per kilogram									
Delta-BHC	ND	ND	ND	ND	ND	40	100,000	500,000	250
Lindane	ND	ND	ND	ND	ND	100	1,300	9,200	100
Alpha-BHC	ND	ND	ND	ND	ND	20	480	3,400	20
Beta-BHC	ND	ND	ND	ND	ND	36	360	3,000	90
Heptachlor	ND	ND	ND	ND	ND	42	2,100	15,000	380
Aldrin	ND	ND	ND	ND	ND	5	97	680	190
Heptachlor epoxide	ND	ND	ND	ND	ND	-	-	-	20
Endrin	ND	ND	ND	ND	ND	14	11,000	89,000	60
Endrin aldehyde	ND	ND	ND	ND	ND	-	-	-	-
Endrin ketone	ND	ND	ND	ND	ND	-	-	-	-
Dieldrin	4.03 IP	**10.7 IP**	ND	ND	ND	5	200	1,400	100
4,4'-DDE	**9.83 IP**	**9.49**	**801 IP**	**358 IP**	**34.2**	3.3	8,900	62,000	17,000
4,4'-DDD	ND	ND	**193**	**217 IP**	ND	3.3	13,000	92,000	14,000
4,4'-DDT	ND	ND	ND	ND	ND	3.3	7,900	47,000	136,000
Endosulfan I	ND	ND	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan II	1.93 JIP	1.72 IP	ND	ND	ND	2,400	24,000	200,000	102,000
Endosulfan sulfate	ND	ND	ND	ND	ND	2,400	24,000	200,000	1,000,000
Methoxychlor	ND	ND	ND	ND	ND	-	-	-	900,000
Toxaphene	ND	ND	ND	ND	ND	-	-	-	-
cis-Chlordane	ND	ND	ND	ND	ND	94	4,200	24,000	2,900
trans-Chlordane	ND	ND	ND	ND	ND	-	-	-	-
Chlordane	ND	ND	ND	ND	ND	-	-	-	-
Polychlorinated Biphenyls in micrograms per kilogram									
Aroclor 1016	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1221	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1232	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1242	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1248	ND	ND	**2,720**	**2,440**	**734**	100	1,000	1,000	3,200
Aroclor 1254	**128**	**196**	**2,500**	**2,790**	**949**	100	1,000	1,000	3,200
Aroclor 1260	85.5	**259**	**2,170**	**4,620**	**2,400**	100	1,000	1,000	3,200
Aroclor 1262	ND	ND	ND	ND	ND	100	1,000	1,000	3,200
Aroclor 1268	ND	ND	ND	ND	ND	100	1,000	1,000	3,200

Notes:

ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
I = Lower value reported due to obvious interference.
P = The RPD between the results exceeds the method-specified criteria.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.
Bold pink-shaded values exceed NYSDEC Commercial Use Cleanup Objectives.
Bold boxed values exceed NYSDEC Part 375/CP-51 Protection of Groundwater.

FPM

- No exceedances of SCOs were noted in any of the samples from boring B11 or B13, which is consistent with the visual observations;

- At boring B12 the VOC acetone slightly exceeded its unrestricted use and protection of groundwater SCO in the 0 to 2-foot interval. No other exceedances were noted in the samples from this boring and the materials in this boring did not exhibit any visual indications of potential impacts;

- At boring B16 the petroleum-related VOCs xylenes and 1,2,4-trimethylbenzene were noted to exceed the unrestricted use SCO in the 0 to 2-foot interval. Several PAH SVOCs were also noted to exceed SCOs in this interval and copper exceeded its unrestricted use SCO in the 2 to 4-foot interval. These results are consistent with the odor and organic vapor readings in this boring; and

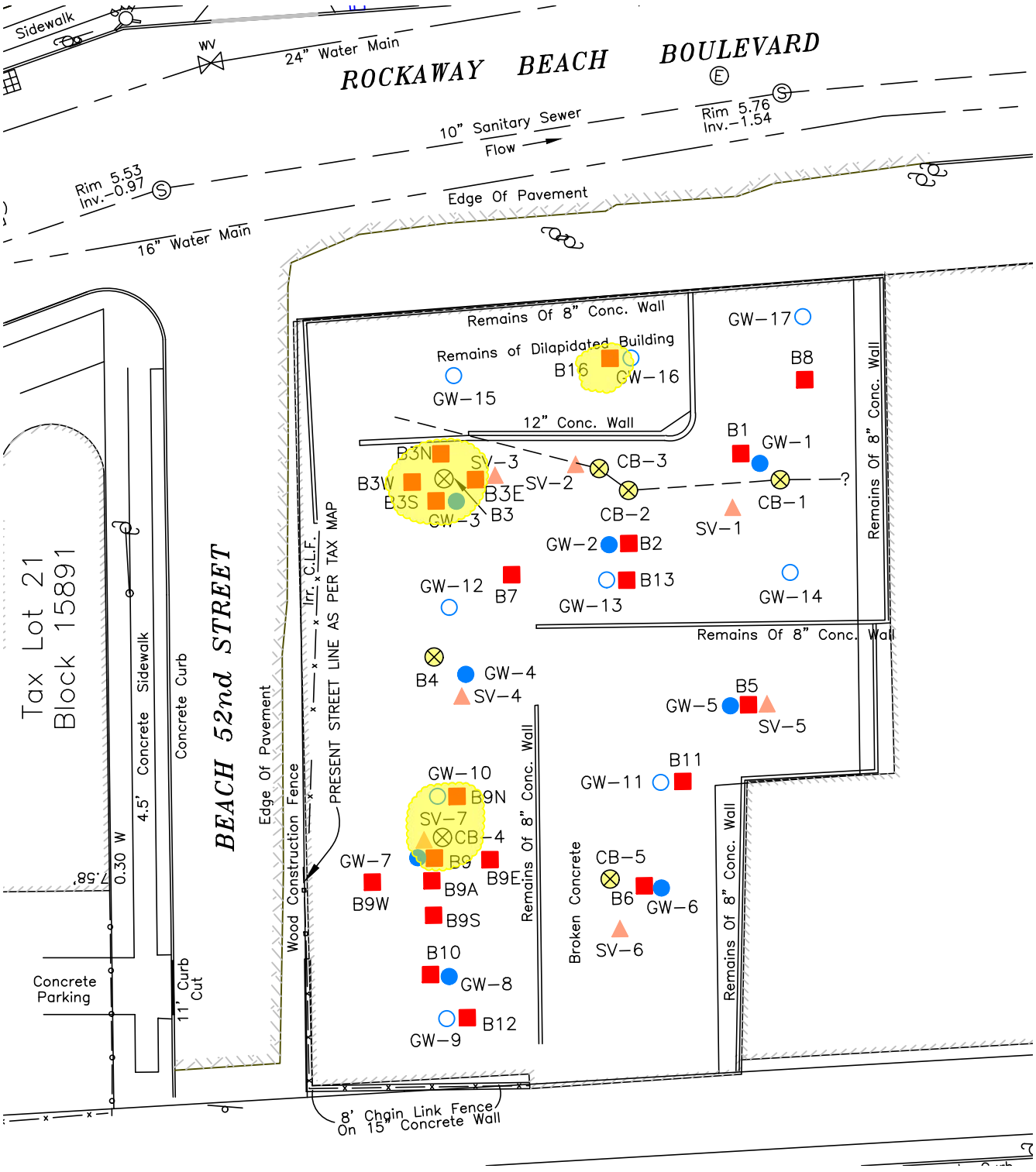
- The sediment in catch basin CB-4 contained several petroleum-related VOCs and TCE at levels that exceed unrestricted use, restricted residential use, commercial use and/or protection of groundwater SCOs. One VOC (acetone) in CB-2 exceeded its unrestricted use and protection of groundwater SCO. The sediment in all four catch basins contained PAH SVOCs, metals, pesticides, and PCBs at levels that exceeded SCOs, with the levels in CB-4 generally noted to be the most elevated. The exceedances in CB-1, CB-2 and CB-5 are typical of impacts associated with accumulations of urban stormwater runoff. The exceedances in CB-4 are more typical of petroleum and chlorinated solvent impacts and are consistent with the soil results in the nearby B9 and B9N borings.

The Supplemental Phase II Investigation soil data are generally consistent with the previous soil sample results from the Property. As discussed in Section 2.2.2, several petroleum-related VOCs and one chlorinated solvent (TCE) were previously detected in boring B9 (depth of 9 feet) at concentrations exceeding the NYSDEC unrestricted use SCOs. Two petroleum-related VOCs in the B9 sample from 5 feet also exceeded the restricted residential use SCOs. Similar impacts were found in nearby catch basin CB-4 and boring B9N during the Supplemental Investigation. These impacts appear to be limited to this area as none of the samples from nearby borings B9W, B9A, B9S or B9E exhibited any exceedances of SCOs for VOCs.

Drywell B3 was previously sampled and found to contain elevated levels of SVOCs. Soil sampling performed around the drywell during the Supplemental Investigation (borings B3N, B3E, B3S and B3W) showed SVOCs and/or some chlorinated solvent and petroleum VOCs at levels exceeding the SCOs.

Catch basins CB-1, CB-2, CB-4 and CB-5 all exhibited exceedances of SCOs for PAH SVOCs, metals, pesticides and PCBs typical of urban stormwater runoff, with CB-4 also showing indications of petroleum-related VOCs and TCE. Previous sampling at drywell structures on the Property (B3, B4, and CB-3) showed similar stormwater-related impacts, with B4 also showing petroleum VOC and TCE impacts.

Collectively, the soil data indicate that soil impacted by chlorinated solvents and petroleum is present at boring B9, catch basin CB-4, and in the surrounding area. The impact appears to be greatest at the B9, B9N and CB-4 locations and decreases laterally to the east, south, and west. The approximate lateral extent of this impact is illustrated on Figure 4.1.1. The impact appears to be greatest at a depth of five feet below grade, coincident with the approximate depth of the



LEGEND:

- CATCH BASIN/DRY WELL
- SUB-GRADE PIPING
- SOIL BORING LOCATION
- GROUNDWATER SAMPLE LOCATION
- GROUNDWATER MONITORING WELL
- SOIL VAPOR SAMPLE LOCATION
- SIGNIFICANTLY IMPACTED SOIL

0' 15 30' 60'

APPROXIMATE SCALE

FPM GROUP

FIGURE 4.1.1
SIGNIFICANTLY IMPACTED SOIL AREAS
51-17 ROCKWAY BEACH BOULEVARD
FAR ROCKWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 2/20/19

Z:\PENINSULA ROCKAWAY\DEP\IMPACTED SOIL AREA.dwg, 2/21/2019 9:56:33 AM, DWG To PDF.pc3

water table, and decreases downward. Very little impact appears to be present by 8 feet below grade and the soil at this depth generally does not exceed NYSDEC SCOs.

Soil impacted by chlorinated solvents and PAH SVOCs is also present in a limited area centered on drywell B3. This impact is present to about 4 feet below grade and is present in limited areas below this depth.

Sediment impacted by PAH SVOCs, metals, pesticides and/or PCBs typical of urban stormwater runoff is present in all of the catch basins and drywells. Petroleum-related VOCs and chlorinated solvents are also present in drywell B3 and catch basin CB-4.

4.2 Groundwater Conditions

Groundwater Flow Direction

The relative elevation of the top of the PVC casing for each well was integrated with depth-to-groundwater measurements obtained on February 15, 2019 to determine the relative elevation of the water table surface at each well; the resulting data are shown on Table 4.2.1. These relative elevations were then used to calculate the Property-specific groundwater flow direction, as shown on Figure 4.2.1. The groundwater flow direction was determined to be to the north-northeast, which is consistent with groundwater quality data, as discussed below.

Groundwater Chemical Analytical Results

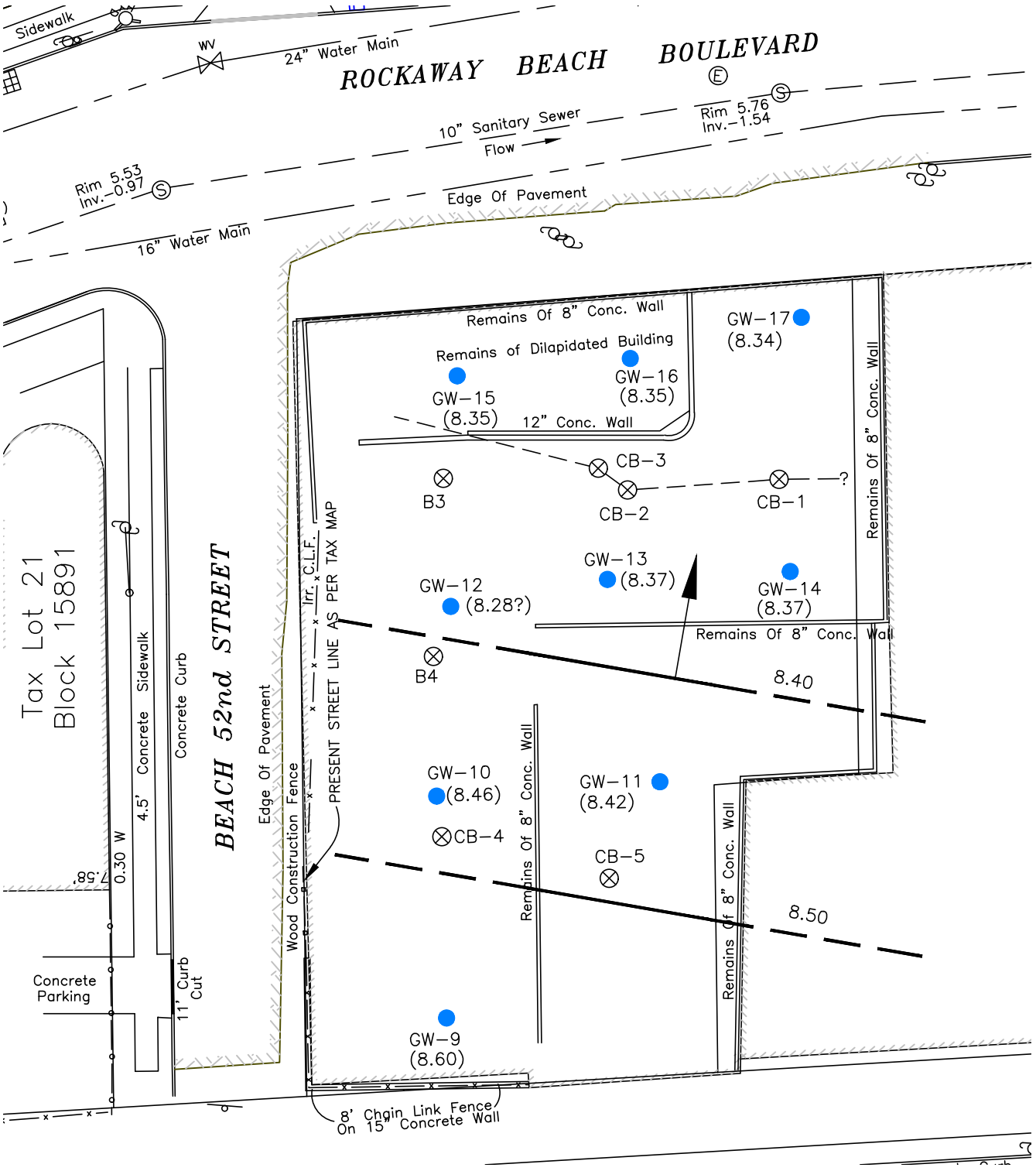
Groundwater sampling was conducted at the GW-9 through GW-17 locations during the Supplemental Investigation. At each location no visible indications of potential contamination were noted, with the exception of GW-10 where a slight petroleum odor was noted. This observation is consistent with the prior groundwater observations in that the only visible indication of potential groundwater contamination had been previously noted at GW-7, which is in proximity to GW-10.

The samples were tested as discussed in Section 3.2, with the results compared to the NYSDEC Standards, as shown in Table 4.2.2. The following observations were noted:

- Petroleum-related VOCs were detected in the GW-10 sample at concentrations somewhat above the NYSDEC Standards. The GW-10 sample was collected in downgradient proximity to the source material at B9/B9N/CB-4 and a short distance downgradient of the previous GW-7 sample that contained more elevated levels of petroleum-related VOCs, as well as TCE. TCE, naphthalene (a petroleum VOC), and chloroform (a breakdown product of chlorinated VOCs) were detected at concentrations somewhat above the NYSDEC Standards at GW-13, which is further downgradient of the B9/B9N/CB-4 source area. These results indicate that the source material at B9/B9N/CB-4 is resulting in groundwater contamination at the Property;
- Chloroform was also detected somewhat above its Standard at GW-15 and GW-16, near the northern (downgradient) side of the Property. These locations are downgradient (north-northeast) of the B3 drywell area where several VOCs, including TCE and its breakdown product cis-1,2-DCE, were found in soil at levels exceeding the NYSDEC unrestricted use and/or protection of groundwater SCOs. These chloroform detections suggest that the chlorinated VOCs found in soil in the B3 drywell area are a source for the chloroform detections noted in the downgradient groundwater and that TCE is breaking down as it migrates in groundwater;

TABLE 4.2.1
WELL TOP OF CASING AND GROUNDWATER RELATIVE ELEVATIONS
51-17 ROCKAWAY BEACH BOULEVARD
FAR ROCKAWAY, NY

Well	Relative Elevation of Top of Casing (feet)	Depth to Water (feet)	Groundwater Relative Elevation (feet)
FEBRUARY 15, 2019			
GW-9	10.00	1.40	8.60
GW-10	10.00	1.54	8.46
GW-11	9.48	1.06	8.42
GW-12	9.85	1.57	8.28
GW-13	9.87	1.50	8.37
GW-14	10.09	1.72	8.37
GW-15	9.99	1.64	8.35
GW-16	9.89	1.54	8.35
GW-17	10.59	2.25	8.34



LEGEND:

- ⊗ CATCH BASIN/DRY WELL
- SUB-GRADE PIPING
- (8.35) GROUNDWATER MONITORING WELL WITH GROUNDWATER RELATIVE ELEVATION(FEB. 2019)
- (8.50) GROUNDWATER RELATIVE ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION

0' 15 30' 60'

APPROXIMATE SCALE

FPM GROUP

FIGURE 4.2.1
GROUNDWATER RELATIVE ELEVATIONS

51-17 ROCKWAY BEACH BOULEVARD
FAR ROCKWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 2/14/19

Z:\PENINSULA ROCKAWAY\DEP\GW ELEVATIONS.dwg, 2/21/2019 9:58:01 AM, DWG To PDF.pc3

TABLE 4.2.2
GROUNDWATER CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Well No.	GW-9	GW-10	GW-11	GW-12	GW-13	GW-14	GW-15	GW-16	GW-17	MW-17D (duplicate)	NYS Class GA Ambient Water Quality Standards
Sampling Date	**2/8/2019**										
Volatile Organic Compounds in micrograms per liter											
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	0.71 J	0.72 J	5
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Chloroform	ND	ND	ND	ND	**13**	4.8	**28**	**25**	6.0	5.8	7
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Benzene	ND	0.36 J	ND	ND	ND	ND	ND	ND	ND	ND	1
Toluene	ND	1.4 J	ND	ND	ND	ND	ND	ND	ND	ND	5
Ethylbenzene	ND	3.4	ND	ND	ND	ND	ND	ND	ND	ND	5
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Bromomethane	ND	ND	ND	ND	0.20 J	ND	ND	ND	ND	ND	5
Vinyl chloride	ND	ND	ND	0.81 J	0.12 J	ND	ND	ND	ND	0.07 J	2
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Trichloroethene	ND	ND	ND	0.89	**6.5**	1.7	0.34 J	0.46 J	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
p/m-Xylene	ND	**9.3**	ND	ND	ND	ND	ND	ND	ND	ND	5
o-Xylene	ND	**8.8**	ND	ND	ND	ND	ND	ND	ND	ND	5
Xylenes, Total	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	-
cis-1,2-Dichloroethene	ND	ND	ND	2.5	2.8	1.3 J	ND	ND	ND	ND	5
1,2-Dichloroethene, Total	ND	ND	ND	2.5	2.8	1.3 J	ND	ND	ND	ND	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Acetone	2.3 J	1.7 J	8.2	2.6 J	3.3 J	ND	2.8 J	4.3 J	3.2 J	2.9 J	50
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0006
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5
Isopropylbenzene	ND	1.3 J	ND	ND	ND	ND	ND	ND	ND	ND	5
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Naphthalene	ND	3.2	ND	ND	**17**	4.7	ND	ND	ND	ND	10
n-Propylbenzene	ND	1.2 J	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,3,5-Trimethylbenzene	ND	**16**	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2,4-Trimethylbenzene	ND	**45**	ND	ND	ND	ND	ND	ND	ND	ND	5
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
p-Diethylbenzene	ND	1.2 J	ND	ND	ND	ND	ND	ND	ND	ND	-
p-Ethyltoluene	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	0.79 J	0.77 J	5
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5

Notes:
ND - Not detected at the reported detection limit for the sample.
J - Estimated concentration above the Method Detection Limit and below the Reporting Limit.
Bold shaded values exceed the NYSDEC Class GA Ambient Water Quality Standards.
- = Not established

TABLE 4.2.2 (CONTINUED)
GROUNDWATER CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Well No.	GW-9	GW-10	GW-11	GW-12	GW-13	GW-14	GW-15	GW-16	GW-17	MW-17D (duplicate)	NYS Class GA Ambient Water Quality Standards
Sampling Date	2/8/2019										
Semivolatile Organic Compounds in micrograms per liter											
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	3.3 J	ND	ND	ND	5
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Dibenzofuran	ND	ND	ND	ND	4.4	ND	1.5 J	ND	ND	ND	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
2,4-Dimethylphenol	ND	16	ND	ND	ND	ND	ND	ND	ND	ND	50
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
2-Methylphenol	ND	1.7 J	ND	ND	ND	ND	ND	ND	ND	ND	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Benzoic Acid	12 J	ND	11 J	20 J	18 J	ND	ND	44 J	ND	ND	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Carbazole	ND	ND	ND	ND	5.0	ND	1.3 J	ND	ND	ND	-
Acenaphthene	ND	0.08 J	ND	0.04 J	4.8	1.5	ND	1.7	0.10 J	0.11	20
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
Fluoranthene	0.28	2.1	0.03 J	0.50	5.7	4.0	0.17	17	0.36	0.50	50
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5
Naphthalene	0.09 J	0.9	ND	0.06 J	**11**	0.76	ND	0.70	ND	ND	10
Benzo(a)anthracene	**0.16**	**1.5**	ND	**0.32**	**2.3**	**1.7**	**0.10**	**8.7**	**0.22**	**0.32**	0.002
Benzo(a)pyrene	**0.18**	**1.5**	ND	**0.38**	**2.2**	**1.5**	**0.11**	**7.8**	**0.18**	**0.31**	ND
Benzo(b)fluoranthene	**0.29**	**1.8**	ND	**0.50**	**2.6**	**1.8**	**0.16**	**9.5**	**0.26**	**0.41**	0.002
Benzo(k)fluoranthene	**0.08 J**	**0.57**	ND	**0.15**	**0.82**	**0.60**	**0.05 J**	**3.2**	**0.10 J**	**0.15**	0.002
Chrysene	**0.27**	**1.5**	ND	**0.33**	**2.1**	**1.5**	**0.13**	**8.2**	**0.26**	**0.39**	0.002
Acenaphthylene	ND	0.04 J	ND	0.02 J	0.05 J	0.11	0.04 J	0.56	ND	0.12	-
Anthracene	0.05 J	0.34	ND	0.09 J	2.9	1.5	0.03 J	4.2	0.13	0.14	50
Benzo(ghi)perylene	0.23	1.2	ND	0.39	1.7	1.2	0.15	4.4	0.20	0.24	-
Fluorene	0.04 J	0.10	ND	0.05 J	3.9	1.5	ND	1.8	0.14	0.14	50
Phenanthrene	0.22	1.0	0.05 J	0.27	10	2.9	0.08 J	12	0.18	0.21	50
Dibenzo(a,h)anthracene	0.06 J	0.28	ND	0.08 J	0.40	0.25	0.03 J	1.1	0.06 J	0.06 J	-
Indeno(1,2,3-cd)pyrene	**0.16**	**0.95**	ND	**0.31**	**1.4**	**0.99**	**0.10 J**	**4.0**	**0.16**	**0.22**	0.002
Pyrene	0.3	2.2	0.03 J	0.48	4.9	3.6	0.18	16	0.47	0.67	50
2-Methylnaphthalene	0.06 J	0.05 J	ND	0.03 J	2.8	0.36	ND	0.64	0.15	0.19	-
Pentachlorophenol	**1.9**	ND	ND	ND	0.37 J	ND	ND	ND	ND	ND	1
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5

Notes:
ND - Not detected at the reported detection limit for the sample.
Bold shaded values exceed the NYSDEC Class GA Ambient Water Quality Standards.
J - Estimated concentration above the Method Detection Limit and below the Reporting Limit.
- = Not established

TABLE 4.2.2 (CONTINUED)
GROUNDWATER CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Well No.	GW-9	GW-10	GW-11	GW-12	GW-13	GW-14	GW-15	GW-16	GW-17	MW-17D (duplicate)	NYS Class GA Ambient Water Quality Standards
Sampling Date	**2/8/2019**										
Total Metals in micrograms per liter											
Aluminum, Total	316	1,520	5,010	755	4,420	33,300	4,040	27,400	4,280	2,870	-
Antimony, Total	1.6 J	1.1 J	**4.64**	1.68 J	1.38 J	1.65 J	0.84 J	1.75 J	1.12 J	1.36 J	3
Arsenic, Total	1.9	6.77	11.21	2.75	5.94	**39.86**	7.53	**44.26**	8.81	6.7	25
Barium, Total	59.09	66.16	123.8	66.76	48.87	576.2	1311	**4,072**	304.3	59.36	1,000
Beryllium, Total	ND	0.14 J	0.26 J	ND	0.25 J	1.73	0.18 J	1.26	0.21 J	0.14 J	3
Cadmium, Total	0.07 J	0.48	0.23	0.11 J	0.06 J	2.33	0.48	2.87	0.32	0.12 J	5
Calcium, Total	71,500	43,300	94,700	77,200	36,000	135,000	26,600	94,500	33,700	31,900	-
Chromium, Total	4.76	9.02	25.76	8.08	16.65	**118.9**	9.63	**81.51**	11.75	7.14	50
Cobalt, Total	0.36 J	1.04	3.66	1.55	3.04	31.47	4.33	30.83	4.49	2.66	-
Copper, Total	4.46	35.49	32.04	6.76	17.95	**228.9**	42.14	**249.9**	34.21	19.23	200
Iron, Total	**534**	**5,910**	**5,530**	**1,420**	**6,230**	**65,800**	**6,940**	**60,500**	**8,000**	**4,470**	300
Lead, Total	12.28	**63.64**	**56.06**	21.55	21.07	**709.8**	**74.38**	**825.4**	**99.05**	**55.34**	25
Magnesium, Total	14,900	4,610	11,300	10,900	5,010	23,400	4,470	17,800	6,140	5,670	35,000
Manganese, Total	20.4	41.61	124.2	65.72	110	**1,095**	119.7	**937.1**	207.8	174.9	300
Mercury, Total	ND	ND	ND	ND	ND	0.24	ND	0.54	ND	ND	0.7
Nickel, Total	3.52	5.2	8.78	3.66	7.85	76.53	10.94	65.17	10.41	6.64	100
Potassium, Total	7,680	2,830	8,200	4,520	3,180	10,500	2,240	5,410	2,810	2,860	-
Selenium, Total	ND	ND	2.3	ND	2.14 J	**11.6**	ND	7.3	ND	ND	10
Silver, Total	ND	ND	ND	ND	ND	0.43	ND	0.48	ND	ND	50
Sodium, Total	**134,000**	**22,000**	**145,000**	**22,500**	**26,600**	**28,200**	12,800	15,800	**31,300**	**33,500**	20,000
Thallium, Total	ND	ND	0.37 J	ND	ND	1.04	0.18 J	1.14	0.15 J		0.5
Vanadium, Total	1.75 J	9.37	11.53	5.18	13.41	95.3	11.55	82.19	13.48	10.06	-
Zinc, Total	65.39	211.7	113.6	38.54	48.19	758.5	830.1	**2,545**	248.4	67.06	2,000
Dissolved Metals in micrograms per liter											
Aluminum, Dissolved	46.5	13.5	75.4	68.6	92.6	49.2	525	35.4	58.7	61	-
Antimony, Dissolved	1.79 J	1.23 J	1.1 J	0.84 J	2.93 J	1.96 J	0.87 J	0.86 J	1.06 J	0.97 J	3
Arsenic, Dissolved	1.81	0.66	3.43	1.17	2.86	2.63	1.6	1.68	2.28	2.2	25
Barium, Dissolved	46.6	25.72	11.77	58.56	6.7	11.06	140.4	13.61	8.73	8.62	1,000
Beryllium, Dissolved	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
Cadmium, Dissolved	ND	0.09 J	ND	ND	ND	ND	0.06 J	ND	ND	ND	5
Calcium, Dissolved	60,100	29,100	40,100	73,600	29,100	31,100	17,700	21,300	23,700	24,000	-
Chromium, Dissolved	1.59	0.28 J	1.7	1	1.28	0.48 J	1.45	0.36 J	0.48 J	0.49 J	50
Cobalt, Dissolved	0.34 J	0.26 J	0.19 J	0.95	ND	0.58	0.53	ND	0.45 J	0.43 J	-
Copper, Dissolved	5.45	16.62	19.8	3.38	1.07	5.24	7.26	2.47	1.03	1.04	200
Iron, Dissolved	180	44.9 J	70.2	232	74.1	66.9	**807**	25.4 J	81.4	86.2	300
Lead, Dissolved	3.13	ND	0.63 J	4.6	ND	0.61 J	8.17	ND	1.26	1.14	25
Magnesium, Dissolved	13,400	3,030	6,040	12,100	2,790	3,970	2,110	2,380	3,630	3,640	35,000
Manganese, Dissolved	22.93	17.52	2.48	63.7	1.73	51.95	14.11	20.51	83.55	82.08	300
Mercury, Dissolved	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7
Nickel, Dissolved	3.2	1.24 J	1.29 J	2.59	0.59 J	2.51	1.5 J	0.59 J	1.16 J	1.13 J	100
Potassium, Dissolved	8,000	2,080	4,660	11,300	2,280	2,780	845	1,050	1,730	1,780	-
Selenium, Dissolved	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
Silver, Dissolved	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50
Sodium, Dissolved	**142,000**	19,300	**100,000**	**27,000**	**25,100**	**23,100**	12,000	12,600	**28,900**	**28,900**	20,000
Thallium, Dissolved	ND	ND	ND	ND	0.15 J	ND	ND	ND	ND	ND	0.5
Vanadium, Dissolved	ND	ND	2.23 J	3.24 J	4.93 J	3.18 J	2.13 J	1.59 J	2.03 J	1.86 J	-
Zinc, Dissolved	34.78	45.56	5.49 J	12.57	15.05	4.76 J	98.9	4.61 J	7.68 J	ND	2,000

Notes:
ND - Not detected at the reported detection limit for the sample.
Bold shaded values exceed the NYSDEC Class GA Ambient Water Quality Standards.
J - Estimated concentration above the Method Detection Limit and below the Reporting Limit.
ug/l = micrograms per liter
- = Not established

TABLE 4.2.2 (CONTINUED)
GROUNDWATER CHEMICAL ANALYTICAL RESULTS
51-17 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, NEW YORK

Well No.	GW-9	GW-10	GW-11	GW-12	GW-13	GW-14	GW-15	GW-16	GW-17	MW-17D (duplicate)	NYS Class GA Ambient Water Quality Standards
Sampling Date	**2/8/2019**										
Polychlorinated Biphenyls in micrograms per liter											
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Aroclor 1260	ND	0.075 JP	ND	ND	ND	ND	ND	0.046 J	ND	ND	0.09
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09
PCBs, Total	ND	0.075 J	ND	ND	ND	ND	ND	0.046 J	ND	ND	-
Pesticides in micrograms per liter											
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06
cis-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
trans-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	0.006 JIP	ND	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05

Notes:
ND - Not detected at the reported detection limit for the sample.
J - Estimated concentration above the Method Detection Limit and below the Reporting Limit.
I -The lower value for the two columns has been reported due to obvious interferance.
P - The RPD between the results for the two columns exceeds the method-specified criteria.
- = Not established

- No exceedances of the NYSDEC Standards were noted for VOCs at any of the other sampling locations, including GW-17 at the downgradient edge of the property, GW-9 on the upgradient side of the property, or the crossgradient locations GW-11, GW-12, or GW-14. The absence of VOC groundwater impacts at these locations indicates that the VOC impacts appear to be confined to the Property and the VOC plume is narrow and well-defined;
- Exceedances of the NYSDEC Standards were noted for PAH SVOCs at all of the sampled locations, with the exception of GW-11. We note that the NYSDEC Standards for the PAH SVOCs are extremely low and PAHs tend to be adsorbed to suspended particulate materials. All of the groundwater samples were highly turbid due to suspended particulates and PAH SVOCs were detected in many of the soil samples. We conclude that the PAH SVOC detections likely resulted from sample turbidity and the detected concentrations are not representative of actual (dissolved) groundwater conditions;
- Metals (totals) were detected in all of the groundwater samples at levels above the NYSDEC Standards. However, metals results for the filtered samples, which represent the actual (dissolved) groundwater conditions unaffected by turbidity, show exceedances only for sodium (most of the groundwater samples) and iron (well GW-15 only). As discussed in Section 1.2, very little (if any) fresh groundwater is anticipated to be present in the Upper Aquifer in the Property vicinity due to the Property's location close to the Atlantic Ocean and Jamaica Bay. The detected sodium concentrations, which range from 12,000 to 142,000 micrograms per liter, are indicative of groundwater influenced by nearby salt water bodies. Iron is often found at elevated levels in Long Island groundwater, and the detection at GW-15 does not appear to present a concern, and
- No PCB or pesticide impacts were identified in any of the groundwater samples.

The groundwater data from the Supplemental Investigation are consistent with the previous groundwater data from the GW-1 through GW-8 locations (these earlier samples were tested for VOCs only). Collectively, these data indicate the following:

- A plume of petroleum-related VOCs and TCE is originating from the B9/B9N/CB-4 area and migrating downgradient (north-northeast). This plume is present at the GW-7, GW-10, GW-13, and GW-2 locations, with a low level of one VOC noted at GW-1 (crossgradient) and GW-8 (upgradient). The plume does not extend further downgradient to GW-17. This plume is narrow, well-defined, and limited to the Property; and
- Chloroform, which is a breakdown product from TCE and other chlorinated solvents, is present at GW-15 and GW-16 at levels somewhat above its Standard. These locations are downgradient (north-northeast) of the B3 drywell area where several VOCs, including TCE and cis-1,2-DCE, were found in soil. The breakdown of TCE to chloroform in the groundwater a short distance downgradient of the apparent source area suggests that this area of groundwater impact is limited.

Figure 4.2.2 depicts the extents of the areas of VOC-impacted groundwater at the property.

LEGEND:

- ⊗ CATCH BASIN/DRY WELL
- SUB-GRADE PIPING
- GROUNDWATER SAMPLE LOCATON
- (8.50) GROUNDWATER RELATIVE ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- AREA OF VOC-IMPACTED GROUNDWATER

0' 15 30' 60'

APPROXIMATE SCALE

FPM GROUP

FIGURE 4.2.2
AREAS OF VOC-IMPACTED GROUNDWATER
51-17 ROCKWAY BEACH BOULEVARD
FAR ROCKWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 2/20/19

Z:\PENINSULA ROCKAWAY\DEP\AREA OF VOC.dwg, 2/21/2019 9:58:45 AM, DWG To PDF.pc3

4.3 Nature and Extent of Contamination

The observations and chemical analytical data from the Supplemental Phase II ESA Investigation were evaluated together with the previous subsurface information from the Property to assess the nature and extent of contamination, as discussed below.

4.3.1 Soil Conditions

- Historic fill consisting of sand containing angular gravel, slag, brick, concrete, and/or asphalt is present to an approximate depth of 3 feet beneath nearly the entire property. These materials are typical of historic fill in the greater New York metro area and this fill was likely placed to facilitate development of the property in the early 1900s.

- Soil impacted by chlorinated solvents and some petroleum VOCs and SVOCs is present in borings B3N, B3E, B3S, and B3W in the B3 drywell area. The impacts exceed the unrestricted use and protection of groundwater SCOs, with some of the SVOC detections also exceeding the restricted residential and/or commercial use SCOs. One metal (zinc) detection exceeds its unrestricted use SCO in boring B3W. The impacts were generally noted in the interval to about 4 feet below grade, with some exceedances also noted in the 4 to 6-foot interval at B3N and B3E. This impacted area appears to be a source for groundwater VOC impacts noted at GW-15 and GW-16 and for soil vapor impacts.

- Soil impacted by petroleum-related VOCs and SVOCs, PCBs, one pesticide and two metals is present in boring B9N. VOC (including TCE), SVOC and metals impacts were also noted in the nearby boring B9 and the CB-4 drywell. The impacts appear to coincide with paint/petroleum odors in the interval from 2 to 8 feet below grade in the borings. This impacted area appears to be a source for groundwater VOC impacts primarily noted at GW-7, GW-10, GW-13, and GW-2 and soil vapor impacts. No impacts were identified in the samples from the B9A, B9E, B9S, or B9W borings, which indicates that the soil impact in this area is limited.

- Some petroleum-related VOC and SVOC impacts were noted in the shallow (0 to 2-foot) interval of boring B16 and copper exceeded its unrestricted use SCO in the 2 to 4-foot interval. These results are consistent with the odor and organic vapor readings in this boring and indicate that an apparently limited amount of petroleum impact is present in the vicinity of this boring.

- Some limited impacts were noted in other borings, including boring B10 (acetone slightly above its unrestricted use and protection of groundwater SCO in the 4 to 6-foot interval and zinc above its unrestricted use SCO in the 0 to 2-foot interval) and boring B12 (acetone slightly above its unrestricted use and protection of groundwater SCO in the 0 to 2-foot interval). These impacts are not associated with visual indications of potential contamination and do not appear to be indicative of significant contamination.

- Catch basins (CB-1, CB-2, CB-3, CB-4 and CB-5) and drywells (B3, B4, and B9) all exhibited exceedances of SCOs for PAH SVOCs, metals, pesticides, and/or PCBs typical of urban stormwater runoff, with CB-4 and B4 also showing indications of petroleum-related VOCs and TCE. These catch basins and drywells may also be sources for VOC impacts to groundwater and soil vapor.

4.3.2 Groundwater Conditions

- Groundwater flow is to the north-northeast, consistent with the distribution of VOC contaminants in groundwater;
- A plume of petroleum-related VOCs and chlorinated solvents is present in groundwater at GW-7, GW-10, GW-13, and GW-2, with lesser impacts noted at GW-1 and GW-8. These impacts appear to originate from source materials in the B9/B9N/CB-4 area. As the plume migrates, TCE is breaking down into cis-1,2-DCE and VC. Chlorinated solvents were not found at levels exceeding NYSDEC Standards at sampling locations located crossgradient from the centerline of the plume (GW-3 to GW-6, GW-11, GW-12, or GW-14 locations), upgradient of the plume (GW-9), or downgradient of the plume (GW-17), indicating that the plume of VOC-impacted groundwater is narrow, well-defined, and limited to the Property;
- A smaller plume chloroform-impacted groundwater is present downgradient of the B3 drywell area where several VOCs, including TCE and cis-1,2-DCE, were found in soil. The breakdown of TCE to chloroform in the groundwater a short distance downgradient of the apparent source area suggests that this area of groundwater impact is limited;
- PAH SVOCs and several metals (totals) were found in nearly all of the groundwater samples. These detections likely resulted from the high turbidity in the groundwater samples are not representative of actual groundwater conditions at the Property. Results from samples that were filtered to remove turbidity generally do not show elevated levels of any metals other than sodium, which was found in most of the samples, consistent with the Property's location in proximity to the Atlantic Ocean. Iron, which is often found at elevated levels in Long Island groundwater, was found above its Standard in one well (GW-15); this detection does not present a concern; and
- Pesticides and PCBs did not exceed the NYSDEC Standards in any of the groundwater samples.

4.3.3 Soil Vapor Conditions

Soil vapor sampling was not performed during the Supplemental Investigation as previous soil vapor sampling data are available to characterize soil vapor conditions. As discussed in Section 2.2.4, soil vapor samples were previously collected from seven locations (SV-1 through SV-7) throughout the Property from beneath the concrete slab of the former buildings and tested in accordance with NYSDOH protocols. The results indicate the following:

- Five VOCs for which the NYSDOH provides guidance, including CT, cis-1,2- DCE, TCE,1,1-DCE, and methylene chloride, were detected in at least one of the soil vapor samples and may pose a concern for SVI. Specifically, the results for 1,1-DCE at SV-7, CT at SV-5 and SV-7, cis-1,2-DCE at SV-1 and SV-3, and methylene chloride at SV-7 could trigger a monitor or mitigate response, and the levels of TCE at SV-1, SV-2, SV-3, and SV-7 would trigger a mitigate response. All of these VOCs were detected in the source material at B9 and/or in the groundwater beneath the Property and, therefore, the soil vapor detections likely originated from this onsite source; and
- Elevated concentrations of several petroleum compounds were detected at SV-7. These detections also appear related to the impacted soil noted in nearby soil boring B9.

4.4 Potential Remedial Measures

As discussed in Section 2.3, it is proposed to redevelop the Property, together with other parcels, with mixed commercial and restricted residential uses. A preliminary redevelopment plan presented in Figure 2.3.1 shows that the Property is to be completely covered by a new residential building and associated covered parking and pavement. No vegetated areas are proposed, with the exception of a stormwater management planter to be located to the north of the building.

Redevelopment activities will include removal of the existing former building infrastructure (walls, pavement, drywells, etc.) from the Property. Excavation is anticipated to be conducted to 4 feet below grade to accommodate grade beams for the new slab-on-grade building. No basement or other subsurface infrastructure is proposed, other than building foundation elements. Public water will be provided to the Property and no use of the Property groundwater is contemplated.

Based on the nature and extent of contamination at the Property and the anticipated redevelopment, a Remedial Action Plan (RAP) should be prepared. The RAP should include an evaluation of potential exposures under the contemplated redevelopment scenario and potential remedial measures to address the identified contamination and potential exposures. Potential remedial measures that should be considered in the RAP include:

- Remediation of source materials;
- Groundwater monitoring to evaluate the anticipated improvement in groundwater quality following remediation of source materials;
- SVI mitigation measures if ground-level areas of the proposed new building will be occupied;
- Measures to control potential exposures to residual soil and groundwater contamination; and
- A Construction Health and Safety Plan (CHASP) to include measures to control potential exposures during construction.

.