ARCADIS Design & Consultancy for natural and built assets

Northrop Grumman Systems Corporation

2015 ANNUAL SUMMARY REPORT

Operation, Maintenance, and Monitoring Report for the Bethpage Park Groundwater Containment System

Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York
NYSDEC ID # 1-30-003A

March 25, 2016

,

Ahren Tatro, PE 095069
Staff Engineer

Paul Martorano, PE 088403
Project Engineer

Christopher Engler, PE 069748
Engineer of Record

Carlo San Giovanni
Project Manager

2015 ANNUAL SUMMARY REPORT

Operation, Maintenance, and Monitoring Report for the Bethpage Park Groundwater Containment System

Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York
NYSDEC ID # 1-30-003A

Prepared for:

Northrop Grumman Systems Corporation

Prepared by:

Arcadis of New York, Inc.
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610

Our Ref.:

NY001496.114I.OMMI4

Date:

March 25, 2016

2015 ANNUAL SUMMARY REPORT
Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York
NYSDEC ID # 1-30-003A

CONTENTS

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

Pursuant to the Administrative Order on Consent (AOC) Index #W1-0018-04-01 (New York State Department of Environmental Conservation [NYSDEC] 2005) and the Operable Unit 3 (OU3) Record of Decision (NYSDEC 2013), ARCADIS of New York, Inc. (ARCADIS), on behalf of Northrop Grumman Systems Corporation (Northrop Grumman), has prepared this OU3 Bethpage Park Groundwater Containment System (BPGWCS) Annual Summary Report for submittal to the NYSDEC. The present-day Bethpage Community Park property (Park), the McKay Field, and Plant 24 Access Road, which the NYSDEC has termed the "Former Grumman Settling Ponds Area" and designated as OU3, are referred to herein as the Site Area. Figure 1 provides a Site Area location map.

The BPGWCS (previously referred to as the Groundwater Interim Remedial Measure) has been operational since July 21, 2009. The operation, maintenance, and monitoring (OM&M) activities performed during 2015 (i.e., January 1 through December 31, 2015 [the "reporting period"]) are summarized in this Annual Summary Report. This report also describes the Operation, Maintenance, and Monitoring (OM&M) activities performed during the fourth quarter of 2015 (i.e., October 1 through December 31, 2015 [the "fourth quarter reporting period"]). Detailed OM&M descriptions for the previous three 2015 quarterly operational periods are available in the following reports (2015 Quarterly Reports):

- Quarterly OM&M Report for the BPGWCS, January 1 through March 31 (Arcadis 2015a)
- Quarterly OM&M Report for the BPGWCS, April 1 through June 31 (Arcadis 2015b)
- Quarterly OM&M Report for the BPGWCS, July 1 through September 30 (Arcadis 2015c)

During this reporting period, Remedial System and Environmental Effectiveness Monitoring Programs were conducted in accordance with the NYSDEC-approved OU3 Groundwater Interim Operation, Maintenance, and Monitoring Manual (OM&M Manual; Arcadis 2009).

As discussed in the OU3 Site Area Remedial Investigation Report (Site Area RI) (Arcadis 2011), Northrop Grumman does not take responsibility for certain compounds (e.g., Freon 12 and Freon 22) present in Site Area groundwater. Throughout this Annual Report, a distinction is made between "Project" and "Non-Project" volatile organic compounds (VOCs), defined as follows:

- Project VOCs: VOCs that may be related to former Northrop Grumman historical activities. For this OM&M Report, Project VOCs include 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene (TCE); vinyl chloride (VC); cis-1,2-dichloroethene (cis-1,2-DCE); trans-1,2-dichloroethene; benzene; toluene; and total xylenes.
- Non-Project VOCs: VOCs, such as Freon 12 and Freon 22, that are understood to be unrelated to former Northrop Grumman activities but have been detected in Site Area groundwater. As noted in the Site Area RI (Arcadis 2011), a sub-plume of Freon 22 has been identified originating from the area of the Town of Oyster Bay's (Town's) former ice rink (shown on Figure 2). Based on Town information (Zervos 2007), Freon 22 was used by the Town and released to the environment.

2. BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM OBJECTIVES

Remedial action objectives (RAOs) for the BPGWCS are as follows:

- Mitigate the off-site migration of dissolved-phase VOCs. Specifically, the BPGWCS addresses:
    - Groundwater that has total VOC concentrations greater than 5 micrograms per liter (µg/L) in the upper 20 feet of the surficial aquifer across the 1,200-foot-wide lateral extent of the Site Area southern boundary.
    - Groundwater below the upper 20 feet of the surficial aquifer that has total VOC concentrations greater than 50 µg/L across the 1,200-foot-wide lateral extent of the Site Area southern boundary.
- Comply with applicable NYSDEC standards, criteria, and guidance values (SCGs) for treated water and air emissions.

A secondary benefit of the BPGWCS is the creation of a clean-water front atop downgradient groundwater, which minimizes the potential for vapor intrusion downgradient of the Site Area.

3. BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM DESCRIPTION

The BPGWCS consists of:

- A pump-and-treat system where groundwater is:
    - Extracted along the Plant 24 Access Road via four remedial wells
    - Conveyed to a treatment plant at McKay Field via four underground pipelines
    - Treated via air stripping to reduce concentrations of Project and Non-Project VOCs to comply with applicable NYSDEC SCGs for treated water
    - Filtered to remove oxidized metals to comply with applicable NYSDEC SCGs for treated water
    - Returned to the aquifer via a discharge pipeline routed to a recharge basin located on the adjacent former Bethpage Navy Weapons Industrial Reserve Plant property
- A vapor-phase treatment system that reduces concentrations of Project VOCs in the air stripper off-gas prior to discharge to the atmosphere
- A groundwater monitoring network periodically monitored to assess environmental effectiveness of the BPGWCS

Major components of the BPGWCS are as follows:

- Four remedial wells (RW-1, RW-2, RW-3, and RW-4) with design pumping rates of 30 gallons per minute (gpm), 75 gpm, 75 gpm, and 30 gpm, respectively; for a total design influent flow rate of 210 gpm.
- One low-profile air stripper to remove VOCs from extracted groundwater prior to discharge to the recharge basins.
- Two bag filter units configured so that one is operational and the other is in standby mode. The system control logic automatically switches from the operational filter unit to the standby filter unit when the bag filter is full to prevent a system shutdown and the spent filters are then replaced.
- Four emission control units, two containing vapor-phase granular-activated carbon and two containing potassium permanganate-impregnated zeolite, to treat Project VOCs in the air stripper off-gas.
- A groundwater monitoring network, consisting of 35 monitoring locations, including 17 groundwater monitoring wells, four remedial wells, and 14 piezometers.

The OM&M Manual (Arcadis 2009) provides additional information on the BPGWCS. Figure 2 shows the layout of the BPGWCS, and Figure 3 provides a schematic drawing. Figure 4 shows groundwater sampling locations that form the groundwater monitoring network. Appendix A provides construction details for the monitoring wells and piezometers.

4. OPERATION AND MAINTENANCE ACTIVITIES

4.1 Fourth Quarter 2015

The BPGWCS operated continuously, at either full or reduced flow, during the fourth quarter of 2015, with the exception of shutdown periods for routine maintenance and alarm conditions.

- The BPGWCS operated at full or reduced capacity 90 out of 92 days (98 percent uptime).
- Based on groundwater volume recorded at the remedial well flow meters, remedial wells operated at average flow rates of 28 gpm (RW-1), 71 gpm (RW-2), 71 gpm (RW-3), and 28 gpm (RW-4). The observed average flow rates for all remedial wells were lower than their design flow rates due to approximately 102 hours of downtime attributed to routine maintenance activities and alarm-related treatment system downtime. Remedial wells operated at reduced instantaneous flow rates (between 93 percent and 97 percent of design) during portions of the reporting period due to iron buildup in the pumps, influent pipelines, and valves. The reduced flow rates were corrected by adjusting the manifold globe valves.
- The system was monitored either through site visits or remotely by wireless computer link-up.
- The Supervisory Control and Data Acquisition System operated as designed, and when conditions warranted (see below), the system shut down automatically and instantaneously, and notified plant operators of system advisories and alarms.
- Intentional system shutdowns were as follows (see Table 1 for more information):
  - Combined quarterly/ semi-annual/ annual maintenance (October 27 and 28, 2015)

- System shutdowns due to alarm conditions were as follows (see Table 1 for more information):
  - Air stripper high pressure alarm (October 21, 2015): the problem was caused by increased blower pressure. The solution was to adjust the alarm setpoint and restart the system. This alarm appeared to be an anomaly.
  - Bag filter differential high pressure alarm (October 22, 2015): the problem was caused by multiple bag filter changes in a short period of time. The solution was to replace the bag filters and restart the system.
  - Air stripper high sump level alarm (October 25, 2015): the problem was caused by fault of the air stripper sump pump. The solution was to reset the pump and restart the system.
  - Overvoltage (November 4, December 2, and December 8, 2015): the problem was caused by power supply anomalies. The solution was to allow for normalization of the power supply voltage and restart the system.
  - Motor overload condition at RW-2 (November 19, 2015): the problem was caused by an incorrect set-point of the thermal overload. The solution was to reset the breaker at RW-2, adjust the thermal overload set-point, and restart the system.

4.2 Annual System Performance and Alarm Summary

The 2015 system operational up-time is provided on Table 1 and summarized below. System shut downs that occurred in 2015 are summarized below, and are described in the three 2015 Quarterly Reports (ARCADIS 2015a, ARCADIS 2015b, and ARCADIS 2015c) and in this report. In general, system operation in 2015 is consistent with operation in previous years.

In 2015:

- The system operated full-time, 348 out of 365 days (95% uptime).
- The remedial wells operated at reduced flow rates during portions of the year due to iron build-up in the pumps, influent pipelines and valves. The reduced flow rates were corrected by adjusting the manifold globe valves or through the performance of periodic system maintenance (e.g., remedial well Aqua Gard™ and Aqua Freed™ treatments, pulling and replacing the remedial well pumps, and valve cleaning). Other, non-periodic maintenance was also performed to correct the reduced flow rates experienced at the recovery wells. This maintenance included the replacement of the motor shroud at RW-2. While the maintenance measures did not eliminate the problems associated with iron fouling, they lessened the flow rate impacts, lessened the time between pump/motor failures and provided a means to manage system uptime.
- There were 27 system shutdowns, of which:
  - Three (3) shutdowns were due to overvoltage from the power supply. Following each shutdown the system was restarted when voltage normalized.
  - Twelve (12) shutdowns were for system maintenance (e.g. periodic preventative system maintenance, remedial well maintenance, and required system repairs/upgrade).

- Twelve (12) shutdowns were due to alarm conditions encountered during the normal operation of the system:
    - Eight (8) alarm conditions were due to well alarms (e.g. low pressure, motor overload). As noted above, these problems were corrected by replacing the motors and pumps and installing motor shrouds at RW-2 and RW-3.
    - Two (2) alarm conditions were due to the second bag filter clogging before an operator could change out the first spent bag filter. As noted above, this situation is atypical and the solution is to change out the bag filters and restore normal operations as soon as feasible.
    - One (1) alarm condition was due to an air stripper high pressure alarm. As noted above, the problem was corrected by adjusting the set-point.
    - One (1) alarm condition was due to an air stripper high sump level caused by a clogged strainer. This problem was corrected by resetting the pump.

- There were approximately 49 days of reduced flow, including:
    - RW-4 downtime of approximately 24 days due to necessary repairs to the well head.
    - RW-3 downtime of approximately 11 days due to a motor overload condition.
    - RW-2 downtime of approximately 7 days due to a motor overload condition.
    - RW-2 downtime of approximately 6 days due to redevelopment.
    - RW-1, RW-2 and RW-3 downtime of approximately 10 hours due to pressure testing.
    - RW-1 and RW-2 downtime of approximately 10 hours due to pressure testing.

For the most part, the system was able to be restarted without incident the same day or the day following an alarm. OM&M activities were conducted in accordance with the NYSDEC-approved OU3 Groundwater Interim Operation, Maintenance, and Monitoring Manual (OM&M Manual; Arcadis 2009).

5. SYSTEM MONITORING ACTIVITIES

5.1 2015 System Monitoring Activities

The following compliance and performance monitoring activities were conducted during this fourth quarter reporting period (see Appendix B, Table B-1 for a summary of the compliance and performance monitoring program requirements):

- Three sampling events to collect required water samples and air samples
- Nine weekly site visits to monitor and record key system operational parameters

System O&M results for the annual reporting period are summarized in the following tables, graphs, and appendices:

- Operational Summary, including monitoring events, system operational days, and noteworthy site activities (Table 1)

- Summary of Influent and Effluent Water Sample Analytical Results (Tables 2 and 3, respectively) - Table 3 also provides the BPGWCS treatment system removal efficiency. Appendix B includes complete validated water sample analytical results summaries for each sampling event.
- Summary of Influent and Effluent Vapor Sample Analytical Results (Tables 4 and 5, respectively) - Table 5 also provides the BPGWCS treatment system removal efficiency. Appendix C includes complete, validated vapor sample analytical results for each sampling event.
- System Parameters, including flow rates, line pressures, and temperatures (Table 6)
- Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates (Table 7) - Table 7 provides a breakdown of these parameters by Remedial Well and System and breaks down the VOC mass recovered and VOC recovery rates into Project, Non-Project, and total VOCs.
- Air Discharge Quality Evaluation and Summary of Air Emissions Model Output (Appendix D and Table 8, respectively)
- Concentrations of VOCs and Metals in Remedial Well Groundwater Samples (Tables 9 and 10, respectively)
- Cumulative Total, Project, and Non-Project VOC Mass Removed (Figure 5)
- Remedial Well Total, Project, and Non-Project VOC Concentrations (Figures 6A, 6B, and 6C, respectively)
- Influent Total, Project, and Non-Project VOC Concentrations (Figure 7)
- Total, Project, and Non-Project VOC Mass Recovery Rates (Figures 8A, 8B, and 8C, respectively)

5.2 Summary of Monitoring Results and Conclusions

5.2.1 System Operation and Effectiveness

Fourth quarter and annual BPGWCS monitoring results and conclusions are summarized below:

- Total volume of groundwater recovered and treated (Table 7):
  - Fourth quarter 2015: 27.1 million gallons
  - 2015 Annual Total: 103.7 million gallons
  - Cumulative total since system startup: 661 million gallons
- Total VOC mass recovered (Table 7 and Figure 5):
  - Fourth Quarter 2015: 15 pounds (lbs) of VOCs
  - 2015 Annual Total: 57 lbs of VOCs
  - Cumulative total since system startup: 2,111 lbs of VOCs
- VOC mass recovered and mass removal rates (Table 7 and Figures 8A, 8B, and 8C):

  - Majority of VOCs recovered during the fourth quarter reporting period were Project VOCs (86.0 percent or 13 lbs). The majority of VOCs recovered during the 2015 reporting period were Project VOCs (80.4 percent or 46 lbs).
  - Majority of Project VOCs are recovered by RW-2 (97.2 percent during the fourth quarter reporting period and 96.3 percent during the 2015 reporting period) and RW-3 (2.4 percent during the fourth quarter reporting period and 3.2 percent during the 2015 reporting period)
  - Majority of Non-Project VOCs are recovered by RW-3 (42.7 percent during the fourth quarter reporting period and 48.8 percent during the 2015 reporting period), RW-4 (38.5 percent during the fourth quarter reporting period and 36.6 percent during the 2015 reporting period), and RW-2 (18.8 percent during the fourth quarter reporting period and 14.5 percent during the 2015 reporting period).

- Treatment system influent concentrations (Table 2 and Figures 6A, 6B, 6C, and 7):
  - Project VOC influent concentration, which was 47 µg/L during the fourth quarter reporting period, is consistent with historical values. Project VOC influent concentration was generally stable over the 2015 reporting period. These concentrations are well below the recent peak concentration observed in 2014 (105 µg/L). Project VOC influent concentrations have generally decreased since 2010.
  - Non-Project VOC influent concentration, which was 5.5 µg/L during the fourth quarter reporting period, is consistent with historical values. Non-Project VOC influent concentration generally decreased over the 2015 reporting period. These concentrations are below the recent peak concentration observed in 2014 (55 µg/L). Non-Project VOC influent concentrations have generally decreased since 2010.
  - Total iron in the influent sample was detected at a level of 2,050 µg/L during the fourth quarter reporting period, which is consistent with historical values. Total iron in the effluent samples ranged from 275 µg/L to 297µg/L during the fourth quarter reporting period, which is below the total iron discharge limit of 600 µg/L. Total iron in both the influent and the effluent samples was generally stable over the 2015 reporting period.
  - Mercury has not been detected in any influent or effluent sample since system startup.
- Project VOCs in Remedial Wells RW-1, RW-3, and RW-4 (Table 9) were not detected during the fourth quarter reporting period above applicable SCGs and generally decreased in concentration during the 2015 reporting period. In Remedial Well RW-2, several Project VOCs (cis-1,2-DCE, toluene, TCE, and VC) have remained stable over the 2015 reporting period and continue to be detected above applicable SCGs. Similar to total influent concentrations, Project VOC remedial well concentrations have generally decreased since 2010, with Project VOCs not detected above applicable SCGs in Remedial Well RW-3 since November 2013, or in RW-1 and RW-4 since system startup.
- Non-Project VOCs in Remedial Wells RW-1, RW-2, RW-3 and RW-4 (Table 9) were not detected above applicable SCGs during the fourth quarter reporting period. Similar to total influent concentrations, Non-Project VOC remedial well concentrations have generally decreased during the

2015 reporting period and since 2010, with Non-Project VOCs not detected above applicable SCGs in Remedial Wells RW-1, RW-2, or RW-4 since system startup. Only two detections of Non-Project VOCs have been above applicable SCGs in RW-3 since system startup.

- Metals concentrations in remedial wells during this reporting period (Table 10) are consistent with historical metals concentrations.
- The air stripper, air stripper off-gas treatment system, and bag filter system performed within acceptable operating ranges for this reporting period, as indicated by:
  - The air stripper VOC removal efficiency was greater than 99.9 percent for Project and Non-Project VOCs (Table 3).
  - Both water and air discharges complied with applicable SCGs and discharge limits (Tables 3, 5, and 8).

5.2.2 Regulatory Status of Discharges

5.2.2.1 Air Discharge

To determine the compliance status of air discharge from the BPGWCS treatment system, the system's effluent vapor concentrations were compared to NYSDEC Division of Air Resources Air Guide-1 (DAR-1) Model Short-term Guideline Concentrations (SGCs [NYSDEC 2014]; Table 5) and the effluent vapor laboratory results were compared to a site-specific modeled annual maximum allowable stack concentration (MASC). The annual MASC was calculated during each monitoring event for individual compounds using the output from the United States Environmental Protection Agency (USEPA) SCREEN3 Model in conjunction with the NYSDEC DAR-1 Annual Guideline Concentrations (AGCs). A scaling factor was calculated using the SCREEN3 model with site-specific physical layout information (e.g., building dimensions, stack height, terrain) and operating data (e.g., air flow rate, temperature) inputs for each monitoring event. The scaling factor was then used to adjust (scale) the NYSDEC DAR-1 AGC to a site-specific MASC. Table 8 provides a summary of the instantaneous percent (i.e., not time-weighted) of the site-specific annual MASC for detected Project and Non-Project VOCs, as well as a summary of the cumulative annual percent (i.e., time-weighted) of the site-specific MASC. Appendix D provides a summary of the model inputs, outputs, and backup calculations.

The BPGWCS air effluent met NYSDEC requirements throughout the reporting period, as indicated by the following:

- The measured concentrations of individual VOCs in the vapor effluent did not exceed applicable SGCs (Table 5).
- The measured concentration of individual VOCs in the vapor effluent did not exceed applicable, instantaneous MASCs, as calculated using the USEPA SCREEN 3 Model (Table 8). Similarly, the time-weighted rolling averages for the individual detected Project and Non-Project VOCs are below their respective MASCs.

5.2.2.2 Water Discharge

The BPGWCS-treated water effluent met NYSDEC regulatory requirements during the reporting period (Table 3 and Appendix B), as indicated by the following:

- The measured concentration of individual VOCs in the treated water effluent were below applicable discharge limits, per the interim State Pollutant Discharge Elimination System (SPDES) equivalency permit.
- The measured concentration of total iron and total mercury in the treated water effluent were below applicable discharge limits. In addition, total mercury continues to be non-detect and has not been detected in any treated water effluent sample since system startup.

6. ENVIRONMENTAL EFFECTIVENESS MONITORING

BPGWCS environmental effectiveness (i.e., hydraulic monitoring and groundwater quality monitoring) activities and results for this reporting period are discussed below.

6.1 Hydraulic Monitoring

6.1.1 Activities

In accordance with OM&M Manual requirements and methodologies (ARCADIS 2009), a quarterly round of groundwater hydraulic monitoring was performed during the reporting period. Specifically, depth-to-water measurements were completed on December 17, 2015 at the 42 locations forming the approved monitoring well network (Figure 9).

6.1.2 Results

Table 11 summaries results of depth-to-water measurements to date. Figure 9 displays the configuration of the shallow potentiometric surface and groundwater flow directions on December 17, 2015 at the Site Area. Figure 9 indicates that groundwater under the Park is being drawn toward and captured by the remedial wells.

- Figure 10 provides a cross-sectional view of vertical groundwater flow (based on groundwater levels measured on December 17, 2015), and Project VOC concentrations in groundwater above 5 µg/L (based on results from the December 2015 groundwater sampling round). Figure 10 indicates that groundwater containing Project VOCs above 5 µg/L is being drawn toward, and captured by, the remedial wells (RW-1 through RW-4) to a depth of approximately 145 feet below land surface. Figure 9, in combination with Figure 10, indicates that the BPGWCS' expected capture zone has developed, and off-site migration of groundwater (to a depth of approximately 145 feet below land surface) containing Project VOC concentrations greater than 5 µg/L is being prevented.

6.2 Groundwater Quality Monitoring

6.2.1 Activities

An annual groundwater sampling round was performed in December as part of a site-wide sampling activity. Groundwater samples were collected from 13 monitoring wells included in the OU3 OM&M Manual (Arcadis 2009). A Hydraulic Effectiveness Evaluation (HEE) of the BPGWCS was y performed in 2014-2015 (ERM 2015). As part of the ERM study a total of 6 monitoring wells and 6 piezometers were installed. Groundwater samples were also collected during this annual round from 4 of the monitoring wells installed during the HEE (MW-204-1, MW-205-1, MW-206-1 and MW-208-1). Monitoring Wells MW-

207A and MW-207B, installed during the HEE, were not sampled due to obstructions identified in the well screens and the wells are being assessed. Findings will be provide in a separate submission. .

Groundwater samples collected from the 17 monitoring wells were analyzed for Target Compound List (TCL) VOCs, plus Freon 12 and Freon 22, using USEPA Method 8260C and total and dissolved metals (cadmium and chromium) using USEPA Method 6010.

6.2.2 Results

Groundwater quality data, including historical results to date, are summarized in Table 12 (VOCs) and Table 13 (metals).

6.3 Environmental Effectiveness Monitoring Conclusions

An evaluation of the hydraulic control of the BPGWCS was performed based on hydraulic monitoring and groundwater sampling performed in December 2015. The results are presented in Figure 9 and Figure 10. Findings and conclusions are given below:

- Figure 9 shows the configuration of the shallow potentiometric surface and the inferred horizontal groundwater flow directions on December 17, 2015 at the Site and this figure indicates that groundwater under the Park is being drawn toward, and captured by, the remedial wells.
- Figure 10 is a cross-section view of vertical groundwater flow and Project VOC concentrations in groundwater above 5 µg/L. This figure indicates that groundwater containing Project VOCs above 5 µg/L is being drawn toward, and captured by, the remedial wells (RW-1 through RW-4) to a depth of approximately 145 feet below land surface.
- Based on Figure 9 and Figure 10, the BPGWCS' expected capture zone has developed, and off-site migration of groundwater (to a depth of approximately 145 feet below land surface) containing Project VOC concentrations greater than 5 µg/L is being prevented.

The above evaluation results will be reviewed and updated as appropriate when the HEE (ERM 2015) is finalized pending NYSDEC comments.

7. RECOMMENDATIONS

- Remove mercury from the SPDES equivalency monitoring program because mercury has not been detected in any system effluent water sample analyzed for mercury.
- Suspend use of the emission control units (ECUs) for air discharges, based on continued evaluation of the treatment system and decreased influent vapor concentrations. The measured concentration of individual VOCs in the vapor influent did not exceed applicable, instantaneous MASCs, as calculated using the USEPA SCREEN 3 Model. Similarly, the time-weighted rolling averages for the individual detected Project and Non-Project VOCs are below their respective MASCs. A letter providing findings as well as modeling results will be provided under separate cover.
- The format of the quarterly reports will be revised, consistent with the NYSDEC-approved quarterly report format for the OU3 Bethpage Park Soil Gas Containment System (NYSDEC ID #1-30-003A). Beginning with the first quarter of 2016, quarterly reports will consist of a memo submitted to NYSDEC

with tabulated sample analytical results and a figure, without data evaluation. Annual Summary Reports will continue to be prepared and submitted under the supervision of a licensed professional engineer to summarize and evaluate system operation, performance, and monitoring data.

8. REFERENCES

Arcadis of New York, Inc. (Arcadis). 2009. Interim Operation, Maintenance, and Monitoring Manual, Northrop Grumman Groundwater Interim Remedial Measure, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. December 2009.

Arcadis. 2011. Remedial Investigation Report (Site Area). Operable Unit 3 – Former Grumman Settling Ponds, Bethpage, New York. NYSDEC Site #1-30-003A. February 8, 2011.

Arcadis. 2012. Operation, Maintenance, and Monitoring Report for the Groundwater Interim Remedial Measure, 2011 Annual Summary Report. Operable Unit 3 – Former Grumman Settling Ponds, Bethpage, New York. NYSDEC Site #1-30-003A. March 23, 2012.

Arcadis. 2015a. Quarterly Operation, Maintenance, and Monitoring Report for the Bethpage Park Groundwater Containment System, March 2015, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. NYSDEC ID #1-30-003A. May 29, 2015.

Arcadis. 2015b. Quarterly Operation, Maintenance, and Monitoring Report for the Bethpage Park Groundwater Containment System, Second Quarter 2015, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. NYSDEC ID #1-30-003A. August 27, 2015.

Arcadis. 2015c. Quarterly Operation, Maintenance, and Monitoring Report for the Bethpage Park Groundwater Containment System, Third Quarter 2015, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York (NYSDEC ID #1-30-003A). November 30, 2015.

ERM Consulting and Engineering, Inc. (ERM). 2015. Bethpage Park Groundwater Containment System Hydraulic Effectiveness Evaluation Report. July 2015.

New York State Department of Environmental Conservation (NYSDEC). 2005. Order on Consent, Index #W1-0018-04-01, Site #1-30-003A, July 4, 2005.

NYSDEC. 2009. Interim State Pollution Discharge Elimination System (SPDES) Letter, March 19, 2009.

NYSDEC. 2013. Record of Decision, Northrop Grumman – Bethpage Facility, Operable Unit Number: 03, State Superfund Project, Bethpage, Nassau County, Site No. 130003A, March 29, 2013.

NYSDEC. 2014. DAR-1 AGC/SGC Tables, Revised February 28, 2014.

Zervos, Theodore. 2007. Deposition of Theodore Zervos in the matter Town of Oyster Bay v. Northrop Grumman Systems Corporation et al. Case No. 05-CV-1945 (TCP)(AKT). January 22, 2007.

TABLES

Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

MONTH	DAY																													Days Operational (1)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
2009 Total																																160
2010 Total																																352
2011 Total																																351
2012 Total																																353
2013 Total																																354
2014 Total																																349
Jan-15	b				(3)			b				#				b				(4)b	(5)					b				(6)	b	24
Feb-15						(7)b						###/*/**	b	(8)						b		(9)				b						27
Mar-15				(10) K	C	b						b							b				#			b				(11)		29
1Q 2015																																80
Apr-15	(12)		b						b							b						b					b		##			30
May-15				b	(13)	(14)b	b				b										b					###/*/**		b				31
Jun-15			b					##	b						(15)(16)b		(17)					b										28
2Q 2015																																89
Jul-15			(18)b	(19)				b								(20)bb				(21)bb		#	b						b			29
Aug-15			b								b	(22)				b			###/*/**					b		b						31
Sep-15	b							b						(23)	b	(24)	b		b				b				b	#				29
3Q 2015																																89
Oct-15			b				b						#	b						b	(26)b	(27)bb			(28)b	b	(29)	(30)b	b			31
Nov-15		b		(31)	b				b				b				b		(32)	b			###/*/** b					b				29
Dec-15		(33)			b			(34)			b											#	b					b				30
4Q 2015																																90
2015 Total																																348
TOTAL																																**2,267**

Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

Legend:

	Indicates system online for at least the majority of the day.
	Indicates system operated with reduced flow rates.
	Indicates system off-line for at least the majority of the day.
#	Indicates water compliance samples were collected.
##	Indicates water performance samples were collected.
**	Indicates vapor compliance samples were collected.
*	Indicates vapor performance samples were collected.
b	Indicates filter bag unit changed over.
K	Indicates PPZ change-out.
C	Indicates carbon change-out.

Acronyms\Key:

1Q	first quarter
ECU	emission control unit
VPGAC	vapor phase granular activated carbon
PPZ	potassium permanganate-impregnated zeolite
RW	recovery well

Notes:

(1) Days in which the system was operational for the majority of the day are counted as one day.
(2) Spent bag filters are stored in DOT certified 55-gallon drums and disposed of by a subcontractor as non-hazardous waste.

First Quarter 2015

(3) The system was shut down at 10:00 am on January 5, 2015 to install Franklin Electric Submonitors for RW-2 and RW-3. The system was restarted at 3:45 pm on the same day and was offline for approximately 5.8 hours.
(4) The system was shut down at 8:45 am on January 20, 2015 to clean the bag filter effluent piping and sample tap WSP-7 of iron build-up. The system was restarted at 3:50 pm on the same day and was offline for approximately 6 hours.
(5) The system was shut down at 9:10 am on January 21, 2015 to clean iron debris from the air stripper sump. The system shut down multiple time while attempting to restart later in the day, due to an air stripper sump high level. It was determined that the alarm was caused by a high amount of iron sludge remaining in the air stripper sump. A subcontractor with a vacuum truck was used to fully evacuate the sump of any sludge and debris. The sludge and debris was disposed of by the subcontractor as non-hazardous waste. Upon completion, the system was restarted at 8:37 am on January 28, 2015 and was offline for approximately 7 days.
(6) The system was shut down at approximately 12:40 pm on January 30, 2015 to install a new check valve in the effluent piping. The system was restarted at approximately 7:00 pm on the same day. The system was offline for approximately 6.3 hours.
(7) The system shut down at 2:43 am on February 6, 2015 due to a low pressure alarm at RW-2. The system was restarted at 9:09 am on the same day and was offline for approximately 6.5 hours.
(8) The system shut down at 10:21 pm on February 14, 2015 due to a motor overload condition at RW-2 . The system was restarted without RW-2 at 12:15 pm on February 15, 2015; the system was offline for approximately 14 hours. A new recovery well pump and motor was installed in RW-2 on February 19, 2015 and it was brought back online at approximately 3:17 pm the same day. RW-2 was offline for approximately 5 days.
(9) The system shut down at 12:52 pm on February 22, 2015 due to a low pressure alarm at RW-2. The system was restarted at 1:45 pm on the same day and was offline for approximately 1 hour.
(10) The system was shut down at 2:13 pm on March 4, 2015 to change-out VPGAC and PPZ in ECUs 502 and 601, respectively. The VPGAC was transported by the subcontractor to an approved regeneration facility and the PPZ was transported to an approved receiving facility for disposal as non-hazardous waste. The system was restarted at 12:05 pm on March 6, 2015 and was offline for approximately 2 days.
(11) A leak was observed in the well vault for RW-4 at 6:56 pm on March 30, 2015. RW-4 was left offline for the remainder of the reporting period.

Notes continued:

Second Quarter 2015

(12) A leak was observed in the RW-4 well vault at 6:56 pm on March 30, 2015 and RW-4 was left offline until the leak was repaired. RW-4 was restarted at 5:50pm on April 23, 2015 and was offline for approximately 24 days.
(13) The system was shut down at 8:15 am on May 5, 2015 to install a new pump in RW-2 and pressure test RW-1, 2, and 3. The system was restarted at 5:45 pm the same day; however, due to a motor overload condition, RW-3 was left offline.
(14) On May 6, 2015, the motor leads at RW-3 were repaired. The well was restarted at 5:30 pm on the same day and was offline for approximately 1.5 days.
(15) Recovery well RW-2 was shut down at 8:30 am on June 15, 2015 for scheduled redevelopment. RW-2 was restarted at 6:15 pm on June 22, 2015, and was offline for approximately 7.5 days.
(16) The system shut down at 2:45 pm on June 15, 2015 due to a high pressure alarm at the RW-2 influent manifold. The alarm was caused by an unseated butterfly valve during well redevelopment. The valve was seated fully and the system was restarted on at 4:45 pm on the same day. RW-2 was left offline for scheduled redevelopment. The system was offline for approximately 2 hours.
(17) The system was shut down at 10:30 am on June 17th, 2015 for routine maintenance. The system was restarted at 6:30 pm the following day and was offline for approximately 1.5 days.

Third Quarter 2015

(18) The system shut down at 10:49 pm on July 3, 2015 due to a low flow alarm at the RW-3 influent manifold. The system was restarted on July 5, 2015 at approximately 3:45 pm and was offline for approximately 41 hours.
(19) The system shut down at approximately 9:30 pm on July 5, 2015 due to a low pressure alarm at the RW-3 influent manifold. The system was restarted at approximately 8:00 am on July 6, 2015; however, RW-3 was left offline. The system was offline for approximately 11 hours.
(20) The system was shut down at 7:30 am on July 16, 2015 to install a new pump and motor in RW-3 and a new motor shroud in RW-2. The system was restarted at 3:15 pm the same day, and was offline for approximately 8 hours. RW-3 was offline for a total of 13 days.
(21) The system shut down at 3:23 am on July 20, 2015 due to a bag filter differential high pressure alarm resulting from multiple bag filter changes. The alarm was cleared, both of the bag filters changed and the system restarted at 10:55 am on the same day. The system was offline for approximately 10.5 hours.
(22) The system was shut down at approximately 8:05 am on August 12, 2015 to conduct pressure tests on the RW-1 and RW-2 influent pipelines. The system was restarted at approximately 5:55 pm on the same day, and was offline for approximately 10 hours.
(23) The system shut down at 12:10 am on September 14, 2015 due to a low pressure alarm at the RW-2 influent manifold. The system was restarted at approximately 2:00 pm on the same day, however, RW-2 was left offline. The system was offline for approximately 14 hours.
(24) On September 16, 2015 a new pump and motor were installed in RW-2. RW-2 was restarted at approximately 2:15 pm on the same day and was offline for approximately 2.5 days.
(25) The system shut down at 6:44 am am on September 17, 2015 to a low manifold pressure alarm. The alarm was cleared and the system restarted at approximately 8:45 am on the same day. The system was offline for approximately 2 hours.

Table 1
Operational Summary, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Fourth Quarter 2015

(26) The system shut down multiple times on October 21, 2015 due to an air stripper high pressure alarm. The system shut down at 12:15 pm and the alarm was cleared and the system was restarted at 12:52 pm. The system shut down again at 2:58 pm. Following this shutdown, the alarm setpoint was adjusted, the alarm was cleared, and the system was restarted at 4:20 pm. The system was offline for approximately 2 hours.

(27) The system shut down at 2:01 am on October 22, 2015 due to a bag filter differential high pressure alarm resulting from multiple bag filter changes. The alarm was cleared, both of the bag filters changed and the system restarted at 10:33 am on the same day. The system was offline for approximately 8.5 hours.

(28) The system shut down at 8:55 pm on October 25, 2015 due to a air stripper high sump level alarm. The air stripper sump pump was manually operated, the alarm was cleared, and the system was restarted at 8:20 am. The system was offline for approximately 11.5 hours.

(29) On October 27, 2015 the system was shut down at 8:17 am for planned maintenance including cleaning of the influent manifold and check valves. The system was restarted at 3:25 pm on the same day and was offline for approximately 7 hours.

(30) On October 28, 2015 the system was shut down at 8:30 am for planned maintenance including power washing of the air stripper. The system was restarted at 2:12 pm on the same day and was offline for approximately 5.5 hours.

(31) The system shut down at 9:41 am on November 4, 2015 due to overvoltage from the power supply. After several attempts to restart, the system was left offline. The system was restarted at 6:52 am on November 5, 2015 following voltage normalization and was offline for approximately 18 hours.

(32) The system shut down at 6:13 am on November 19, 2015 due to a motor overload condition at RW-2. The breaker at RW-2 was reset, the breaker settings adjusted, the alarm cleared, and the system restarted at 11:20 am. The system was offline for approximately 5 hours.

(33) The system shut down at 4:00 pm on December 2, 2015 due to overvoltage from the power supply. The system was restarted at 10:37 am on December 4, 2015 following voltage normalization and was offline for approximately 42.5 hours.

(34) The system shut down at 8:16 am on December 8, 2015 due to overvoltage from the power supply. The system was restarted at 9:38 am on the same day following voltage normalization and was offline for approximately 1.5 hours.

Table 2
Summary of Influent Water Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound [1]	02/12/15 (µg/L)	05/26/15 (µg/L)	08/19/15 (µg/L)	11/30/15 [4] (µg/L)
Project VOCs				
1,1,1 - Trichloroethane	ND	ND	ND	ND
1,1 - Dichloroethane	**0.41**	**0.33**	**0.26**	0.36
1,2 - Dichloroethane	ND	ND	ND	ND
1,1 - Dichloroethene	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND
Trichloroethene	**4.7**	**4.4**	**3.4**	**3.9**
Vinyl Chloride	**25**	**16**	**10.3**	**15.4**
cis 1,2-Dichloroethene	**14**	**11**	**8.3**	**18.9**
trans 1,2-Dichloroethene	ND	ND	ND	ND
Benzene	ND	ND	ND	ND
Toluene	**9.3**	**4.5**	**2.5**	**7.6**
Xylenes	1.4	0.84	ND	0.82
Subtotal Project VOCs	**55**	**37**	**25**	**47**
Non-Project VOCs				
Dichlorodifluoromethane (Freon 12)	ND	ND	ND	ND
Chlorodifluoromethane (Freon 22)	**12**	**7.0**	**6.2**	**5.5**
Subtotal Non-Project VOCs	**12**	**7.0**	**6.2**	**5.5**
Total VOCs [2]	**67**	**44**	**31**	**53**
1,4-Dioxane	**--**	**--**	**0.36**	**0.33**
Inorganics				
Total Iron	**1,810**	**467**	**981**	**2,050**
Total Mercury	--	--	--	--
pH [3]	**5.3**	**5.7**	**5.6**	**5.7**

See notes on last page.

Table 2
Summary of Influent Water Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Notes:

(1) Only VOCs associated with the interim SPDES equivalency program, plus toluene, benzene, xylenes, non-project related Freon 12 and Freon 22, mercury, and iron are included in this table. Complete VOC and inorganic data summary tables, including VOC TICs, are provided in Appendix B. Laboratory data qualifiers are included in the Appendix B tables.

(2) "Total VOCs" represents the sum of individual concentrations of the compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

(3) Influent pH samples collected and measured in the field by ARCADIS personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.

(4) Inorganics and 1,4-dioxane were sampled on 11/23/15. VOCs were sampled on 11/30/15 due to operator error on 11/23/15.

Acronyms\Key:

700	Bold data indicates that the analyte was detected at or above its reporting limit.
16	Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
ASP	Analytcial Services Protocol
ELAP	Environmental Laboratory Approval Program
IRM	Interim remedial measure.
--	Not analyzed.
ND	Analyte not detected at, or above its laboratory quantification limit.
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
OM&M	Operation, maintenance and monitoring.
SPDES	State Pollutant Discharge Elimination System
TICs	Tentatively identified compounds.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/L	Micrograms per liter.

Table 3
Summary of Effluent Water Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York [1]

ARCADIS Design & Consultancy for natural and built assets

Compound [1]	Discharge Limit [2] (µg/L)	01/12/15 (µg/L)	02/12/15 (µg/L)	03/23/15 (µg/L)	04/29/15 (µg/L)	05/26/15 (µg/L)	06/08/15 (µg/L)	07/22/15 (µg/L)	08/19/15 (µg/L)	09/28/15 (µg/L)	10/13/15 (µg/L)	11/23/15 (µg/L)	12/22/15 (µg/L)
Project VOCs													
1,1,1 - Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1 - Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 - Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1 - Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis 1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans 1,2-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Subtotal Project VOCs	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND	ND	ND
Non-Project VOCs													
Dichlorodifluoromethane (Freon 12)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane (Freon 22)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Subtotal Non-Project VOCs	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total VOCs [3]	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Treatment Efficiency [4]	--	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%
Inorganics													
Total Iron	600	**300**	**320**	**310**	**293**	**321**	**282**	**325**	**299**	**259**	**297**	**275**	**288**
Total Mercury	250	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	--	NA	NA	NA	NA	NA	NA	NA	**0.36**	**0.32**	**0.34**	**0.34**	**0.38**
pH [5]	5.5 - 8.5	6.2	6.2	7.1	6.8	7.1	6.3	6.9	6.9	6.6	6.9	7.1	6.0

See notes on last page.

Table 3
Summary of Effluent Water Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York [(1)]

ARCADIS Design & Consultancy for natural and built assets

Notes:

(1) Only VOCs associated with the interim SPDES equivalency program, including Toluene, Benzene, Xylenes, non-project related Freon 12 and Freon 22, Mercury and Iron are included in this table. Complete VOC and inorganic data summary tables, including VOC TICs, are provided in Appendix B. Laboratory data qualifiers are included in the Appendix B tables.

(2) Discharge limits per the interim SPDES equivalency program or Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Quality Standards and Guidance Values and Groundwater Effluent Limitations, if the compound is not part of the interim SPDES equivalency program.

(3) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

(4) Treatment efficiency was calculated by dividing the difference between the influent and effluent total VOC concentrations by the influent total VOC concentration.

(5) Effluent pH samples collected and measured in the field by ARCADIS personnel on the dates listed using an Oakton Model 300 pH/conductivity meter. pH units are standard units.

Acronyms\Key:

	Bold box indicates value is greater than discharge criterion.
700	Bold data indicates that the analyte was detected at or above its reporting limit.
16	Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
ASP	Analytical Services Protocol.
ELAP	Environmental Laboratory Approval Program
IRM	Interim remedial measure.
NA	Not applicable.
ND	Analyte not detected at, or above its laboratory quantification limit.
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
OM&M	Operation, maintenance, and monitoring.
SPDES	State Pollutant Discharge Elimination System
TICs	Tentatively identified compounds.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/L	Micrograms per liter.
--	Not analyzed.

Table 4
Summary of Influent Vapor Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York [1]

ARCADIS Design & Consultancy for natural and built assets

Compound [2]	2/12/2015 (µg/m^3)	5/26/2015 (µg/m^3)	08/19/15 (µg/m^3)	11/23/15 (µg/m^3)
Project VOCs				
1,1,1 - Trichloroethane	**0.87**	ND	**0.82**	**0.82**
1,1 - Dichloroethane	**5.3**	**5.7**	**4.5**	**5.3**
1,2 - Dichloroethane	**0.40**	ND	ND	0.45
1,1 - Dichloroethene	**3.4**	**2.3**	**1.4**	**2.0**
Tetrachloroethene	**5.4**	**4.2**	**3.6**	**4.5**
Trichloroethene	**63**	**72**	**59**	**55.4**
Vinyl Chloride	**250**	**204**	**125**	**181**
cis 1,2-Dichloroethene	**220**	**199**	**147**	**290**
trans 1,2-Dichloroethene	0.48	ND	0.40	0.59
Benzene	**1.6**	**3.0**	**4.8**	**0.77**
Toluene	**140**	**76**	**49**	**131**
Xylenes	**20**	**15**	**10**	**11**
Subtotal Project VOCs	**710**	**581**	**405**	**683**
Non-Project VOCs				
Dichlorodifluoromethane (Freon 12)	**2.8**	**2.9**	**2.7**	**2.4**
Chlorodifluoromethane (Freon 22)	**101**	**87**	**69**	**48**
Subtotal Non-Project VOCs	**104**	**90**	**72**	**51**
Total VOCs [3]	**814**	**671**	**477**	**734**

See notes on last page.

Table 4
Summary of Influent Vapor Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York (1)

Notes:

(1) Vapor samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Influent samples were collected at Vapor Sampling Port-1 (VSP-1); refer to Figure 3 of this OM&M Report for the location of VSP-1.

(2) Only VOCs that are associated with the interim SPDES equivalency program, Toluene, Benzene, Xylenes, and non-project related Freon 12 and Freon 22 are included in this table. Complete VOC summary tables, including VOC TICs, are provided in Appendix C. Laboratory data qualifiers are included in the Appendix C tables.

(3) "Total VOCs" represents the sum of individual concentrations of compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

Acronyms\Key:

700	Bold data indicates that the analyte was detected at or above its reporting limit.
16	Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
ELAP	Environmental Laboratory Approval Program
IRM	Interim remedial measure.
ND	Analyte not detected at or above its laboratory reporting limit.
NYSDOH	New York State Department of Health
OM&M	Operation, maintenance, and monitoring.
R	The sample results are rejected.
SPDES	State Pollutant Discharge Elimination System
TICs	Tentatively identified compounds.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
$\mu g/m^3$	Micrograms per cubic meter.

Table 5
Summary of Effluent Vapor Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Settling Ponds), Bethpage, New York [1]

Compound [2]	Discharge Limit [3] ($\mu g/m^3$)	2/12/2015 ($\mu g/m^3$)	5/26/2015 ($\mu g/m^3$)	08/19/15 ($\mu g/m^3$)	11/23/15 ($\mu g/m^3$)
Project VOCs					
1,1,1 - Trichloroethane	9,000	ND	ND	ND	ND
1,1 - Dichloroethane	NS	**5.3**	ND	ND	**2.3**
1,2 - Dichloroethane	NS	ND	ND	ND	ND
1,1 - Dichloroethene	380 [4]	**1.3**	ND	ND	**0.79**
Tetrachloroethene	1,000	**0.81**	**3.7**	**0.40**	**1.8**
Trichloroethene	14,000	**4.4**	**2.7**	**1.8**	**1.5**
Vinyl Chloride	180,000	**98**	ND	**14**	**4.3**
cis 1,2-Dichloroethene	190,000 [5]	**230**	ND	**3.3**	**2.6**
trans 1,2-Dichloroethene	NS	ND	ND	ND	ND
Benzene	1,300	**5.1**	**4.5**	**37**	**29**
Toluene	37,000	**11**	**20**	**7.5**	**15**
Xylenes	4,300	1.5	**6.5**	**4.3**	**3.1**
Subtotal Project VOCs	NA	**357**	**37**	**68**	**60**
Non-Project VOCs					
Dichlorodifluoromethane (Freon 12)	NS	**2.6**	**2.9**	**3.0**	**2.6**
Chlorodifluoromethane (Freon 22)	NS	**103**	**91**	**69**	**52**
Subtotal Non-Project VOCs	NA	**106**	**94**	**72**	**55**
Total VOCs [6]	NA	**463**	**131**	**140**	**115**
Treatment Efficiency (Total VOCs) [7]	NA	**43.1%**	**80.5%**	**70.6%**	**84.3%**
Treatment Efficiency (Project VOCs) [8]	NA	**49.7%**	**93.6%**	**83.2%**	**91.2%**

See notes on last page.

Table 5
Summary of Effluent Vapor Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Settling Ponds), Bethpage, New York (1)

Notes:

(1) Vapor samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15. A VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Effluent samples were collected at Vapor Sampling Port-5 (VSP-5); refer to Figure 3 of this OM&M Report for the location of VSP-5.

(2) Only VOCs that are associated with the interim SPDES equivalency program, Toluene, Benzene, Xylenes, and non-project related Freon 12 and Freon 22 are included in this table. Complete VOC summary tables, including VOC TICs, are provided in Appendix C. Laboratory data qualifiers are included in the Appendix C tables.

(3) Discharge limit is compound-specific SGC per the NYSDEC DAR-1 AGC/SGC tables revised Februaury 28, 2014.

(4) An SGC was not provided in the DAR-1 AGC/SGC Tables, dated February 28, 2014. An interim SGC was developed based on guidance of the New York State DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 edition. Interim SGC = (smaller of Time Weighted Average [TWA] - Threshold Limit Value or TWA - Recommended Exposure Limit)/4.2. or 1,600 µg/m^3 / 4.2 = approximately 380 µg/m^3.

(5) An SGC was not provided in the DAR-1 AGC/SGC Tables, dated February 28, 2014. An interim SGC was developed based on guidance provided in Section IV.A.2.b.1 of the New York State DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 edition. Interim SGC = (smaller of Time Weighted Average [TWA] - Threshold Limit Value or TWA - Recommended Exposure Limit)/4.2 or 790,000 µg/m^3 / 4.2 = approximately 190,000 µg/m^3.

(6) "Total VOCs" represents the sum of individual concentrations of all compounds detected. The values used in calculations referenced in this report have been rounded to the nearest whole number.

(7) Treatment efficiency was calculated by dividing the difference between the influent and effluent Total VOC concentrations by the influent Total VOC concentration. Treatment efficiency is only calculated when there is a corresponding influent sample.

(8) Treatment efficiency was calculated by dividing the difference between the influent and effluent total Project VOC concentrations by the influent total Project VOC concentration. Treatment efficiency is only calculated when there is a corresponding influent sample.

Acronyms\Key:

700	Bold data indicates that the analyte was detected at or above its reporting limit.
16	Data that is not bold indicates analyte detected but below its reporting limit; the value is estimated.
AGC	Annual guideline concentration.
DAR-1	Division of Air Resources Air Guidance-1
ELAP	Environmental Laboratory Approval Program
IRM	Interim remedial measure.
NA	Not applicable.
ND	Analyte not detected at or above its laboratory reporting limit.
NS	Guideline concentrations not specified in the NYSDEC DAR-1 AGC/SGC tables. An interim SGC was not developed for these compounds because they have low toxicity ratings in the NYSDEC DAR-1 AGC/SGC tables revised February 28, 2014.
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
OM&M	Operation, maintenance, and monitoring.
SGC	Short-term Guidance Concentration
SPDES	State Pollutant Discharge Elimination System
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/m^3	Micrograms per cubic meter.

Table 6
Summary of System Parameters, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Settling Ponds), Bethpage, New York

Date [1]	Water Flow Rates						Water Pressures [2]					Air Flow Rate [2]	Air Pressures [5]					Air Temp. [5]
	Remedial Well [2]				Combined Influent [3]	Effluent [2]	Remedial Well Effluent [4]				Effluent	Effluent	ECU Influents				Effluent	Effluent
	RW-1	RW-2	RW-3	RW-4			RW-1	RW-2	RW-3	RW-4			GAC-501	GAC-502	PPZ-601	PPZ-602		
	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(psi)	(psi)	(psi)	(psi)	(psi)	(scfm)	(iwc)	(iwc)	(iwc)	(iwc)	(iwc)	(^{o}R)
01/12/15	30.6	76.6	75.6	30.9	214	228	58	45	48	56	13	1,946	4.0	4.9	2.8	0.6	0.0	526
02/12/15	31.8	74.2	75.5	31.1	213	241	57	39	44	56	23	1,891	4.1	7.4	2.6	0.5	0.0	527
03/23/15	30.3	74.9	75.0	29.8	210	237	58	47	42	57	13	1,839	10.5	6.5	0.5	1.5	0.0	528
04/29/15	30.6	75.3	75.5	30.3	212	249	58	23	41	58	9	1,750	11.6[6]	7.2[6]	0.5[6]	1.6[6]	0.0[6]	532[6]
05/26/15	30.9	75.9	75.2	30.2	212	229	58	59	48	58	13	1,819	6.6	2.5	0.8	2.0	0.0	542
06/08/15	30.2	75.1	75.0	29.8	210	225	58	58	49	58	15	1,802	6.5	2.5	0.8	2.0	0.0	539
07/22/15	29.6	75.0	75.6	29.7	210	214	57	28	44	56	12	1,835	6.5	3.2	1.0	2.0	0.0	544
08/19/15	30.2	72.6	77.8	30.1	211	217	57	26	40	56	10	1,790	6.5[7]	2.5[7]	0.6[7]	2.0[7]	0.0[7]	544[7]
09/28/15	29.4	74.6	74.3	29.6	208	221	57	21	37	56	11	1,872	6.7[8]	2.8[8]	0.5[8]	2.0[8]	0.0[8]	540[8]
10/13/15	29.7	75.1	74.9	29.9	210	212	57	13	30	56	20	1,778	6.5[9]	2.6[9]	0.6[9]	2.0[9]	0.0[9]	540[9]
11/23/15	30.4	78.0	75.2	30.2	214	214	56	12	30	55	14	1,919	6.7	3.0	1.8	1.6	0.0	532
12/22/15	30.4	74.5	75.7	30.6	211	207	56	10	25	55	18	1,912	7.0[10]	3.3[10]	0.5[10]	2.3[10]	0.0[10]	534[10]

See notes on last page.

Table 6
Summary of System Parameters, Bethpage Park
Groundwater Containment System, Operable Unit 3
(Former Settling Ponds), Bethpage, New York

Notes:

(1) Operational data collected by ARCADIS on days noted. Parameters listed were typically recorded during compliance monitoring events. Data in this table correspond to approximately the past year of system operation.
(2) Instantaneous parameters obtained from the SCADA HMI: Water Flow Rate, Water Pressure, Air Flow Rate.
(3) Combined influent water-flow rate is the sum of individual well flow rates via the SCADA System.
(4) Remedial Well effluent pressure readings measured at the influent manifold within the treatment system building.
(5) Instantaneous values from field-mounted instruments
(6) Values collected on April 27, 2015 during the weekly site visit. No values collected on day of sampling.
(7) Values collected on August 24, 2015 during the weekly site visit. No values collected on day of sampling.
(8) Values collected on October 5, 2015 during the weekly site visit. No values collected on day of sampling.
(9) Values collected on October 12, 2015 during the weekly site visit. No values collected on day of sampling.
(10) Values collected on December 23, 2015 during the weekly site visit. No values collected on day of sampling.

Acronyms\Key:

ECU	Emission control unit.
gpm	Gallons per minute.
HMI	Human-machine interface.
iwc	Inches of water column.
psi	Pounds per square inch.
^{o}R	Degrees Rankine.
SCADA	Supervisory Control and Data Acquisition
scfm	Standard cubic feet per minute.
Temp.	Temperature.

Table 7
Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates
Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds) Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Operating Period [1]	Volume of Groundwater Recovered (x1,000 gal) [2]					VOC Mass Recovered (lbs) [3] — Total VOCs [5]					VOC Mass Recovered (lbs) [3] — Project VOCs [6]					VOC Mass Recovered (lbs) [3] — Non-Project VOCs [7]					VOC Mass Recovery Rate (lbs/day) [4] — Total VOCs [5]					VOC Mass Recovery Rate (lbs/day) [4] — Project VOCs [6]					VOC Mass Recovery Rate (lbs/day) [4] — Non-Project VOCs [7]				
	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total	RW-1	RW-2	RW-3	RW-4	Total
System Pilot Test, Shakedown and Startup Totals [8]	137	270	251	150	808	NA	NA	NA	NA	1.1	NA	NA	NA	NA	1.0	NA	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2009 Totals	6,592	13,838	16,445	6,574	43,449	0.17	275	53	14	342	0.17	273	19	0.20	293	<0.01	0.56	35	13	48	<0.01	1.7	0.33	0.086	2.1	<0.01	1.7	0.12	<0.01	1.8	<0.01	<0.01	0.22	0.080	0.30
2010 Totals	15,726	35,127	38,160	15,689	104,702	0.56	172	412	89	672	0.56	171	28	0.10	200	<0.01	0.17	383	89	469	<0.01	0.46	1.1	0.24	1.8	<0.01	0.46	0.075	<0.01	0.54	<0.01	<0.01	1.0	0.24	1.3
2011 Totals	15,218	36,570	37,682	15,196	104,666	0.36	167	271	78	516	0.36	167	35	0.09	203	<0.01	1.1	236	78	314	<0.01	0.45	0.73	0.21	1.4	<0.01	0.45	0.095	<0.01	0.55	<0.01	<0.01	0.64	0.21	0.85
2012 Totals	15,260	35,178	36,111	15,336	101,885	0.28	114	113	40	267	0.25	113	12	0.39	126	<0.01	1.5	101	40	141	<0.01	0.31	0.31	0.11	0.73	<0.01	0.31	0.032	<0.01	0.35	<0.01	<0.01	0.28	0.11	0.39
2013 Totals	15,968	37,514	36,622	16,036	106,140	0.14	111	41	18	171	0.14	110	4.3	0.36	113	<0.01	1.6	37	18	57	<0.01	0.30	0.11	0.050	0.47	<0.01	0.30	0.012	<0.01	0.31	<0.01	<0.01	0.10	0.049	0.16
2014 Totals	15,690	33,222	31,199	15,691	95,802	0.063	67	9.9	8.1	85	0.063	65	13.2	0.20	67	<0.01	1.5	8.1	7.9	17	<0.01	0.19	0.028	0.023	0.24	<0.01	0.18	<0.01	<0.01	0.19	<0.01	<0.01	0.023	0.022	0.047
January 2015 through March 2015 Totals																																		
01/01/15 - 02/01/15	1,072	2,676	2,429	1,071	7,248	<0.01	4.4	0.65	0.47	5.5	<0.01	4.2	0.14	0.017	4.4	<0.01	0.12	0.51	0.45	1.1	<0.01	0.14	0.021	0.015	0.18	<0.01	0.14	<0.01	<0.01	0.14	<0.01	<0.01	0.016	0.015	0.035
02/01/15 - 03/01/15	1,248	2,643	2,807	1,248	7,946	<0.01	4.3	0.75	0.55	5.6	<0.01	4.2	0.16	0.020	4.4	<0.01	0.11	0.59	0.52	1.2	<0.01	0.15	0.027	0.020	0.20	<0.01	0.15	<0.01	<0.01	0.16	<0.01	<0.01	0.021	0.019	0.043
03/01/15 - 04/01/15	1,337	3,341	3,007	1,268	8,953	<0.01	5.4	0.80	0.55	6.8	<0.01	5.3	0.17	0.021	5.5	<0.01	0.14	0.64	0.53	1.3	<0.01	0.18	0.026	0.018	0.22	<0.01	0.17	<0.01	<0.01	0.18	<0.01	<0.01	0.021	0.017	0.042
Subtotal Jan - Mar 2015 [9]	3,657	8,660	8,243	3,587	24,147	0.0094	14	2.2	1.6	18	0.0095	14	0.47	0.058	14	<0.01	0.37	1.7	1.5	3.6	<0.01	0.16	0.024	0.018	0.20	<0.01	0.16	<0.01	<0.01	0.16	<0.01	<0.01	0.019	0.017	0.040
April 2015 through June 2015 Totals																																		
04/01/15 - 05/01/15	1,382	3,455	3,110	348	8,295	<0.01	4.0	0.68	0.10	4.8	<0.01	3.9	0.14	<0.01	4.0	<0.01	0.28	0.54	0.10	0.92	<0.01	0.13	0.023	<0.01	0.16	<0.01	0.13	<0.01	<0.01	0.13	<0.01	<0.01	0.018	<0.01	0.031
05/01/15 - 06/01/15	1,410	3,522	3,123	1,410	9,465	<0.01	4.1	0.68	0.41	5.2	<0.01	4.0	0.14	0.022	4.2	<0.01	0.13	0.54	0.39	1.1	<0.01	0.13	0.022	0.013	0.17	<0.01	0.13	<0.01	<0.01	0.14	<0.01	<0.01	0.017	0.013	0.035
06/01/15 - 07/01/15	1,318	2,601	3,036	1,318	8,273	<0.01	3.0	0.66	0.39	4.1	<0.01	2.9	0.14	0.021	3.1	<0.01	0.093	0.53	0.37	1.0	<0.01	0.10	0.022	0.013	0.14	<0.01	0.10	<0.01	<0.01	0.10	<0.01	<0.01	0.018	0.012	0.033
Subtotal Apr - Jun 2015 [10]	4,110	9,578	9,269	3,076	26,033	0.012	11	2.0	0.90	14	0.012	11	0.42	0.043	11	<0.01	0.50	1.6	0.90	3.0	<0.01	0.12	0.022	0.010	0.15	<0.01	0.12	<0.01	<0.01	0.12	<0.01	<0.01	0.018	0.010	0.033
July 2015 through September 2015 Totals																																		
07/01/15 - 08/01/15	1,301	3,252	1,980	1,301	7,834	<0.01	2.5	0.39	0.34	3.2	<0.01	2.4	0.068	0.016	2.5	<0.01	0.13	0.32	0.33	0.78	<0.01	0.081	0.013	0.011	0.10	<0.01	0.077	<0.01	<0.01	0.081	<0.01	<0.01	0.010	0.011	0.025
08/01/15 - 09/01/15	1,408	3,520	3,309	1,408	9,645	<0.01	2.7	0.65	0.37	3.7	<0.01	2.6	0.11	0.018	2.7	<0.01	0.14	0.54	0.35	1.0	<0.01	0.087	0.021	0.012	0.12	<0.01	0.084	<0.01	<0.01	0.087	<0.01	<0.01	0.017	0.011	0.032
09/01/15 - 10/01/15	1,346	3,135	3,029	1,346	8,856	<0.01	2.4	0.60	0.35	3.4	<0.01	2.3	0.10	0.017	2.4	<0.01	0.12	0.49	0.34	1.0	<0.01	0.080	0.020	0.012	0.11	<0.01	0.077	<0.01	<0.01	0.080	<0.01	<0.01	0.016	0.011	0.033
Subtotal July - Sept 2015 [11]	4,055	9,907	8,318	4,055	26,335	0.007	7.6	1.6	1.1	10	<0.01	7.3	0.28	0.051	7.6	0.007	0.39	1.4	1.0	2.8	<0.01	0.083	0.017	0.012	0.11	<0.01	0.079	<0.01	<0.01	0.083	<0.01	<0.01	0.015	0.011	0.030
October 2015 through December 2015 Totals																																		
10/01/15 - 11/01/15	1,363	3,406	3,066	1,363	9,198	<0.01	4.4	0.42	0.30	5.1	<0.01	4.3	0.10	0.017	4.4	<0.01	0.14	0.31	0.28	0.73	<0.01	0.14	0.014	0.010	0.17	<0.01	0.14	<0.01	<0.01	0.14	<0.01	<0.01	0.010	<0.01	0.024
11/01/15 - 12/01/15	1,333	3,179	2,998	1,333	8,843	<0.01	4.1	0.41	0.30	4.8	<0.01	4.0	0.10	0.017	4.1	<0.01	0.13	0.31	0.28	0.70	<0.01	0.14	0.014	0.010	0.16	<0.01	0.13	<0.01	<0.01	0.14	<0.01	<0.01	0.010	<0.01	0.023
12/01/15 - 01/01/16	1,341	3,352	3,067	1,341	9,101	<0.01	4.3	0.42	0.30	5.0	<0.01	4.2	0.10	0.017	4.3	<0.01	0.14	0.31	0.28	0.70	<0.01	0.14	0.014	0.010	0.16	<0.01	0.14	<0.01	<0.01	0.14	<0.01	<0.01	0.010	<0.01	0.023
Subtotal Oct - Dec 2015 [12]	4,037	9,937	9,131	4,037	27,142	<0.01	13	1.3	0.90	15	<0.01	13	0.30	0.051	13	<0.01	0.41	0.93	0.80	2.1	<0.01	0.14	0.014	0.010	0.16	<0.01	0.14	<0.01	<0.01	0.14	<0.01	<0.01	0.010	<0.01	0.023
2015 Totals[13]	15,859	38,082	34,961	14,755	103,657	0.028	45	7.1	4.5	57	0.021	45	1.5	0.20	45	0.007	1.7	5.6	4.2	12	<0.01	0.12	0.019	0.012	0.16	<0.01	0.12	<0.01	<0.01	0.12	<0.01	<0.01	0.015	0.012	0.032
Total [14]	100,450	229,801	231,431	99,427	661,109	1.6	951	908	252	2,111	1.6	944	113	1.5	1,049	0.007	8.1	806	250	1,057	--	--	--	--	--	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 7
Summary of Groundwater Recovered, VOC Mass Recovered, and VOC Mass Recovery Rates
Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds) Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Notes:

(1) Represents operating period between consecutive monitoring events.
(2) Volume of groundwater recovered is based on individual local well totalized flow readings. Listed value is the difference between totalized flow values recorded between consecutive monitoring events. The total groundwater recovered during a given operating period is the sum of the individual well flow totals. Values shown are rounded to the nearest gallon, but should only be considered accurate to two significant figures to account for error associated with field measurements.
(3) Mass recovered per well was calculated by multiplying the Total VOC concentration from the most recent sampling event by the number of gallons extracted during the reporting period. The total amount recovered during a given operating period is the sum of masses recovered from each of the individual wells. Values less than ten pounds are presented using two significant figures and values greater than ten pounds have been rounded to the nearest whole number; however, these values should only be considered accurate to two significant figures to account for error associated with field measurements and analytical data.
(4) Mass recovery rates were calculated by dividing the total mass recovered for each well and for the system by the number of days in the respective operating period. Values are presented using two significant figures.
(5) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.
(6) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethelyene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and xylenes-o,m, p.
(7) "Non-Project VOCs" represents the difference between Total VOCs and Project VOCs.
(8) Values based on operational data recorded prior to system startup on July 21, 2009.
(9) The volume of groundwater recovered and mass recovered calculations represent the operational period between January 1, 2015 and April 1, 2015.
(10) The volume of groundwater recovered and mass recovered calculations represent the operational period between April 1, 2015 and July 1, 2015.
(11) The volume of groundwater recovered and mass recovered calculations represent the operational period between July 1, 2015 and October 1, 2015.
(12) The volume of groundwater recovered and mass recovered calculations represent the operational period between October 1, 2015 and January 1, 2016.
(13) The volume of groundwater recovered and mass recovered calculations represent the operational period between January 1, 2015 and January 1, 2016.
(14) "Total" refers to the amounts removed by the Operable Unit 3 Bethpage Park Groundwater Containment System.

Acronyms\Key:

IRM Interim Remedial Measure.
gal Gallons.
HMI Human-machine interface.
lbs Pounds.
lbs/day Pounds per day.
-- Not applicable.

Table 8
Summary of Air Emissions Model Output, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound	AGC [1] ($\mu g/m^3$)	Percent of MASC Per Event [2]				Percent AGC [3]
		2/12/15	5/26/15	8/19/15	11/23/15	
1,1,1 - Trichloroethane	5,000	0.00%	0.00%	0.00%	0.00%	0.00%
1,1 - Dichloroethane	0.63	0.13%	0.00%	0.00%	0.06%	0.04%
1,2 - Dichloroethane	0.038	0.00%	0.00%	0.00%	0.00%	0.00%
1,1 - Dichloroethene	200	0.00%	0.00%	0.00%	0.00%	0.00%
2-Butanone	5,000	0.00%	0.00%	0.00%	0.00%	0.00%
Acetone	30,000	0.00%	0.00%	0.00%	0.00%	0.00%
Chloroform	14.7	0.03%	0.01%	0.01%	0.01%	0.01%
Ethylbenzene	1,000	0.00%	0.00%	0.00%	0.00%	0.00%
Xylenes (o)	100	0.00%	0.00%	0.00%	0.00%	0.00%
Xylenes (m,p)	100	0.00%	0.00%	0.00%	0.00%	0.00%
Chloromethane	90	0.00%	0.00%	0.00%	0.00%	0.00%
Methylene Chloride	60	0.00%	0.00%	0.00%	0.00%	0.00%
Tetrachloroethene	4.0	0.00%	0.01%	0.00%	0.01%	0.01%
Trichloroethene	0.2	0.34%	0.21%	0.14%	0.11%	0.20%
Vinyl Chloride	0.068	22.17%	0.00%	3.14%	0.97%	5.95%
cis 1,2 Dichloroethene	63	0.06%	0.00%	0.00%	0.00%	0.01%
trans 1,2 Dichloroethene	63	0.00%	0.00%	0.00%	0.00%	0.00%
Benzene	0.13	0.60%	0.53%	4.31%	3.42%	2.18%
Toluene	5,000	0.00%	0.00%	0.00%	0.00%	0.00%
2-Hexanone	30	0.00%	0.00%	0.00%	0.00%	0.00%
Trichlorofluoromethane (Freon 11)	5,000	0.00%	0.00%	0.00%	0.00%	0.00%
Dichlorodifluoromethane (Freon 12)	12,000	0.00%	0.00%	0.00%	0.00%	0.00%
Chlorodifluoromethane (Freon 22)	50,000	0.00%	0.00%	0.00%	0.00%	0.00%
Trichlorotrifluoroethane (Freon 113)	180,000	#N/A	#N/A	#N/A	#N/A	#N/A

See notes on last page

Table 8
Summary of Air Emissions Model Output, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York

Notes:

(1) Compound-specific AGC values per the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014. NYSDEC DAR-1 AGCs were scaled using the results of a site-specific annual USEPA SCREEN 3 model to calculate the annual MASC per monitoring event.

(2) Percent of AGC (or Percent MASC) was calculated by dividing the actual effluent concentration by the site-specific annual MASC. Detailed calculations are included in Appendix D.

(3) Percent AGC is the 12-month average at the end of the reporting period. The Percent AGC was calculated by time-weighting the "Percent MASCs" for the individual sampling events over the past year. MASCs are typically calculated once per quarter, thus the MASCs for each month within a quarter are assumed to be the same.

Acronyms\Key:

AGC	Annual Guideline Concentration.
DAR-1	Division of Air Resources Air Guidance-1.
MASC	Maximum allowable stack concentration.
NYSDEC	New York State Department of Environmental Conservation.
SGC	Short-term Guideline Concentration.
USEPA	U.S. Environmental Protection Agency
VOC	Volatile organic compound
$\mu g/m^3$	micrograms per cubic meter

Table 9
Concentrations of Volatile Organic Compounds in Groundwater
Samples Collected from Remedial Wells,
Bethpage Park Groundwater Containment System, Operable Unit 3, (Former Settling Ponds)
Bethpage, New York.

ARCADIS Design & Consultancy for natural and built assets

COMPOUND (µg/L) / Sample Location: / Sample Date:	NYSDEC SCGs	RW-1 2/12/2015	RW-1 5/26/2015	RW-1 8/19/2015	RW-1 11/23/2015	RW-2 2/12/2015	RW-2 5/26/2015	RW-2 8/19/2015	RW-2 11/23/2015	RW-3 2/12/2015	RW-3 5/26/2015	RW-3 8/19/2015	RW-3 11/23/2015	RW-4 2/12/2015	RW-4 5/26/2015	RW-4 8/19/2015
1,1,1-Trichloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.1**	**1.1**	**0.94 J**	**0.84 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.42 J**	**0.37 J**	**0.36 J**
1,1-Dichloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.95 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	0.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane	1	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	NE	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
4-methyl-2-pentanone	50	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Acetone	NE	< 5.0 U	< 10 U	< 10 U	< 10 U	< 5.0 U	< 10 U	< 10 U	< 10 U	< 5.0 U	< 10 U	< 10 U	< 10 U	< 5.0 U	< 10 U	< 10 U
Benzene	1	< 10 U	< 0.50 U	< 0.50 U	< 0.50 U	< 10 U	< 0.50 U	< 0.50 U	< 0.50 U	< 10 U	< 0.50 U	< 0.50 U	< 0.50 U	< 10 U	< 0.50 U	< 0.50 U
Bromodichloromethane	50	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform	50	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	5	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 4.0 U	< 2.0 U	< 2.0 U
Carbon Disulfide	60	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	0.30 J	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon tetrachloride	5	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodibromomethane	50	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodifluoromethane (Freon 22)	NE	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**18.6**	**12.1**	**9.6**	**7.1**	**50.1**	**32.8**	**29.7**
Chloroethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	7	< 1.0 U	< 1.0 U	**0.20 J**	< 1.0 U	**2.4**	**2.2**	**3.3**	**3.1**	**6.8**	**8.7**	**9.9**	**5.2**	**0.36 J**	**0.33 J**	**0.38 J**
Chloromethane	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-dichloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**47.7**	**39.1**	**30.2**	**59**	**3.2**	**2.5**	**1.9**	**1.8**	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,3-dichloropropene	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)	5	< 1.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 1.0 U	< 2.0 U	< 2.0 U
Dichloromethane	5	< 5.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 5.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 5.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 5.0 U	< 2.0 U	< 2.0 U
Ethylbenzene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.8**	**2.1**	**1.4**	**1.9**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methyl N-Butyl Ketone	50	< 1.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 1.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**0.29 J**	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 2.0 U	**0.29 J**	< 1.0 U
Styrene	5	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**0.82 J**	**0.84 J**	**0.61 J**
Toluene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**34.3**	**16**	**9.5**	**27.6**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-dichloroethene	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-dichloropropene	0.4	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethylene	5	**0.31 J**	**0.34 J**	< 1.0 U	< 1.0 U	**13**	**12.8**	**10.1**	**9.9**	**3.5**	**2.9**	**2.2**	**2.2**	**0.72 J**	**0.67 J**	**0.54 J**
Trichlorofluoromethane (Freon 11)	5	< 5.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 5.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 5.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 5.0 U	< 2.0 U	< 2.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Vinyl Chloride	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**88**	**63**	**36.6**	**50**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylene-o	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**2.0**	**1.2**	**0.52 J**	**0.95 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Xylenes - m,p	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**3.0**	**2.1**	**0.97 J**	**1.8**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Total VOCs [2]		**0.31**	**0.34**	**0.20**	**0**	**195**	**140**	**93.5**	**155**	**32**	**26**	**23.6**	**16.3**	**53**	**48**	**31.6**
Project VOCs [3]		**0.31**	**0.34**	**0**	**0**	**190**	**135**	**88.8**	**150**	**6.7**	**5.4**	**4.1**	**4.0**	**2.0**	**1.8**	**1.5**
1,4-Dioxane		**--**	**--**	**0.29**	**0.21 J**	**--**	**--**	**0.80**	**0.54**	**--**	**--**	**0.16 J**	**0.12 J**	**--**	**--**	**0.08 J**

See notes on last page.

Table 9
Concentrations of Volatile Organic Compounds in Groundwater
Samples Collected from Remedial Wells,
Bethpage Park Groundwater Containment System, Operable Unit 3, (Former Settling Ponds)
Bethpage, New York.

Notes:

(1) Water samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3 (prior to September 1, 2014) and per USEPA Method 8260C (after September 1, 2014). Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009). See previous quarterly reports for historical analytical results.

(2) "Total VOCs" represents the sum of individual concentrations of the VOCs detected.

(3) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and xylenes-o,m, and p.

Acronyms\Key:

Indicates an exceedance of an SCG.

Bold value indicates a detection.

ASP	Analytical services protocol.
ELAP	Environmental Laboratory Approval Program
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
SCGs	Standards, criteria, and guidance values.
VOC	Volatile organic compound.
µg/L	Micrograms per liter.
--	Not analyzed.
NE	Not established.
B	Compound detected in associated blank sample.
D	Compound identified from secondary dilution.
J	Compound detected but below its reporting limit; the value is estimated.
R	Concentration for the compound was rejected.
UB	Compound considered non-detect due to associated blank contamination.
< 5; <5 U	Compound not detected above its laboratory quantification limit.

Table 10
Concentrations of Metals in Groundwater Samples Collected from Remedial Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Sample Location: / COMPOUND / Sample Date: (µg/L)	NYSDEC SCGs	RW-1 11/23/2015	RW-2 11/23/2015	RW-3 11/23/2015	RW-4 11/23/2015
Total Cadmium	5	< 3.0	< 3.0	< 3.0	< 3.0
Dissolved Cadmium	5	< 3.0	< 3.0	< 3.0	< 3.0
Total Chromium	50	**29**	< 10	< 10	< 10
Dissolved Chromium	50	**31**	< 10	< 10	< 10
Total Iron	300	< 100	**817**	**203**	< 100
Dissolved Iron	300	< 100	**741**	< 100	< 100

See notes on last page.

Notes:

(1) Water samples collected by Arcadis on the dates shown and submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory for metals analysis using USEPA Method 6010 and for mercury analyses using USEPA Method 7470. Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).

(2) Beginning January 2012 metals analyses for recovery wells RW-1 and RW-4 are included with annual recovery well sampling performed in the fourth quarter of each year.

Acronyms/Key:

	Indicates an exceedance of an SCG.
700	Bold data indicates that the analyte was detected at or above its reporting limit.
ASP	Analytical services protocol.
ELAP	Environmental Laboratory Approval Program
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
USEPA	U.S. Environmental Protection Agency
SCGs	Standards, criteria, and guidance values.
µg/L	Micrograms per liter.
--	Not analyzed.
< 5	Compound not detected above its laboratory quantification limit.

Notes:

(1) Water samples collected by Arcadis on the dates shown and submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory for metals analysis using USEPA Method 6010 and for mercury analyses using USEPA Method 7470. Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).

(2) Beginning January 2012 metals analyses for recovery wells RW-1 and RW-4 are included with annual recovery well sampling performed in the fourth quarter of each year.

Acronyms/Key:

	Indicates an exceedance of an SCG.
700	Bold data indicates that the analyte was detected at or above its reporting limit.
ASP	Analytical services protocol.
ELAP	Environmental Laboratory Approval Program
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health
USEPA	U.S. Environmental Protection Agency
SCGs	Standards, criteria, and guidance values.
µg/L	Micrograms per liter.
--	Not analyzed.
< 5	Compound not detected above its laboratory quantification limit.

Table 12
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds) Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	B24MW-2 4/23/2009	B24MW-2 10/4/2010	B24MW-2 10/27/2011	B24MW-2 10/3/2012	B24MW-2 6/13/2013
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5.0 J
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0 J
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5.0 J
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5.0 J
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50 J
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50 J
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 50 J
Acetone	NE	< 50 B	< 50	< 50 B	< 50	< 50 J
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.70 J
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5.0 J
Bromoform	50	< 5	< 5	< 5	< 5	< 5.0 J
Bromomethane	5	< 5	< 5	< 5	< 5	< 5.0 J
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5.0 J
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5	< 5.0 J
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5.0 J
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	**0.41 J**	< 5.0 J
Chloroethane	5	< 5	< 5	< 5	< 5	< 5.0 J
Chloroform	7	< 5	**0.3 J**	< 5	**1.3 J**	**0.21 J**
Chloromethane	5	< 5	< 5	< 5	< 5	< 5.0 J
cis-1,2-Dichloroethene	5	< 5	< 5	< 5	**1.9 J**	**0.23 J**
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0 J
Chlorodibromomethane	50	< 5	< 5	< 5	< 5	< 5.0 J
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5.0 J
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5.0 J
Methyl-Tert-Butylether	5	--	< 5	--	**0.45 J**	**0.21 J**
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5.0 J
Styrene (Monomer)	5	< 5	< 5	< 5	< 5	< 5.0 J
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5.0 J
Toluene	5	< 5	< 5	< 5	< 5	< 5.0 J
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0 J
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0 J
Trichloroethene	5	**3.7 J**	**4.4 J**	**3.2 J**	**25**	**4.3 J**
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5.0 J
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2.0 J
o-Xylene	5	< 5	< 5	< 5	< 5	< 5.0 J
m,p-Xylene	5	< 5	< 5	< 5	< 5	< 5.0 J
Total VOCs (3)		**3.7**	**4.7**	**3.2**	**29.06**	**5.0**
Project VOCs (4)		**3.7**	**4.4**	**3.2**	**26.9**	**4.5**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	B24MW-2 11/13/2014	B24MW-2 12/28/2015	B24MW-3 4/20/2009	B24MW-3 10/6/2010	B24MW-3 10/27/2011
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	*< 1.0*	**0.62 J**	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 1.0	*< 1.0*	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 1.0	*< 1.0*	< 5	< 5	< 5
1,1-Dichloroethane	5	< 1.0	*< 1.0*	< 5	< 5	< 5
1,1-Dichloroethene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 1.0	*< 1.0*	< 5	< 5	< 5
1,2-Dichloropropane	1	< 1.0	*< 1.0*	< 5	< 5	< 5
2-Butanone	NE	< 10	*< 10*	< 50	< 50	< 50
2-Hexanone	50	< 5.0	*< 5.0*	< 50 J	< 50	< 50
4-Methyl-2-Pentanone	50	< 5.0	*< 5.0*	< 50 J	< 50	< 50
Acetone	NE	< 10	*< 10*	< 50	< 50	< 50
Benzene	1	< 1.0	*< 0.50*	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 1.0	*< 1.0*	< 5	< 5	< 5
Bromoform	50	< 4.0	*< 1.0*	< 5	< 5	< 5
Bromomethane	5	< 2.0	*< 2.0*	< 5	< 5	< 5
Carbon Disulfide	60	< 2.0	*< 2.0*	< 5	< 5	< 5
Carbon Tetrachloride	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Chlorobenzene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	*< 5.0*	< 5	< 5	< 5
Chloroethane	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Chloroform	7	< 1.0	*< 1.0*	< 5	< 5	**0.32 J**
Chloromethane	5	< 1.0	*< 1.0*	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	< 1.0	*< 1.0*	**10**	**1.2 J**	**0.4 J**
cis-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	< 5	< 5	< 5
Chlorodibromomethane	50	< 1.0	*< 1.0*	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5.0	*< 2.0*	< 5	< 5	< 5
Ethylbenzene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Methyl-Tert-Butylether	5	< 1.0	*< 1.0*	--	< 5	--
Methylene Chloride	5	< 2.0	*< 2.0*	< 5	< 5	< 5
Styrene (Monomer)	5	< 5.0	*< 1.0*	< 5	< 5	< 5
Tetrachloroethene	5	< 1.0	*< 1.0*	**0.51 J**	< 5	< 5
Toluene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	< 5	< 5	< 5
Trichloroethene	5	**2.7**	***2.7***	**45**	**5.9**	**1.4 J**
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	*< 5.0*	< 5	< 5	< 5
Vinyl Chloride	2	< 1.0	*< 1.0*	< 2	< 2	< 2
o-Xylene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
m,p-Xylene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Total VOCs (3)		**2.7**	***2.7***	**56**	**7.1**	**2.12**
Project VOCs (4)		**2.7**	**2.7**	**56.1**	**7.1**	**1.8**
1,4-Dioxane		**--**	**0.185**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	B24MW-3 10/4/2012	B24MW-3 6/13/2013	B24MW-3 11/13/2014	B24MW-3 12/28/2015	B30MW-1 4/23/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
1,1,2-Trichloroethane	1	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
1,1-Dichloroethane	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
1,1-Dichloroethene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
1,2-Dichloroethane	0.6	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
1,2-Dichloropropane	1	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
2-Butanone	NE	< 50	< 50 J	< 10	*< 10*	< 50
2-Hexanone	50	< 50	< 50 J	< 5.0	*< 5.0*	< 50
4-Methyl-2-Pentanone	50	< 50	< 50 J	< 5.0	*< 5.0*	< 50
Acetone	NE	< 50	< 50 J	< 10 J	*< 10*	< 50 B
Benzene	1	< 0.7	< 0.70 J	< 1.0	*< 0.50*	< 0.7
Bromodichloromethane	50	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Bromoform	50	< 5	< 5.0 J	< 4.0	*< 1.0*	< 5
Bromomethane	5	< 5	< 5.0 J	< 2.0	*< 2.0*	< 5
Carbon Disulfide	60	< 5	< 5.0 J	< 2.0	*< 2.0*	< 5
Carbon Tetrachloride	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Chlorobenzene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5.0 J	< 5.0	*< 5.0*	< 5
Chloroethane	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Chloroform	7	**0.38 J**	**1.3 J**	**0.28 J**	***0.30 J***	< 5
Chloromethane	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
cis-1,2-Dichloroethene	5	**0.62 J**	< 5.0 J	< 1.0	*< 1.0*	< 5
cis-1,3-Dichloropropene	0.4	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Chlorodibromomethane	50	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5.0 J	< 5.0	*< 2.0*	< 5
Ethylbenzene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Methyl-Tert-Butylether	5	< 5	< 5.0 J	< 1.0	*< 1.0*	--
Methylene Chloride	5	< 5	< 5.0 J	< 2.0	*< 2.0*	< 5
Styrene (Monomer)	5	< 5	< 5.0 J	< 5.0	*< 1.0*	< 5
Tetrachloroethene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Toluene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
trans-1,2-Dichloroethene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
trans-1,3-Dichloropropene	0.4	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Trichloroethene	5	**1 J**	**0.44 J**	< 1.0	***0.25 J***	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5.0 J	< 5.0	*< 5.0*	< 5
Vinyl Chloride	2	< 2	< 2.0 J	< 1.0	*< 1.0*	< 2
o-Xylene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
m,p-Xylene	5	< 5	< 5.0 J	< 1.0	*< 1.0*	< 5
Total VOCs (3)		**2**	**1.7**	**0.28**	***0.55***	**0**
Project VOCs (4)		**1.62**	**0.4**	**0**	***0.25***	**0**
1,4-Dioxane		**--**	**--**	**--**	**0.257**	**--**

Table 12
Concentrations of Volatile Organic Compounds and
in Groundwater Samples Collected from Monitoring
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	B30MW-1 10/4/2010	B30MW-1 10/27/2011	B30MW-1 10/3/2012	B30MW-1 6/14/2013	B30MW-1 11/13/2014
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5.0	< 1.0
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5.0	< 1.0
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5.0	< 1.0
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50	< 50	< 10
2-Hexanone	50	< 50	< 50	< 50	< 50	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 5.0
Acetone	NE	< 50 B	< 50	< 50	< 50	< 10
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.70	< 1.0
Bromodichloromethane	50	< 5	< 5	< 5	< 5.0	< 1.0
Bromoform	50	< 5	< 5	< 5	< 5.0	< 4.0
Bromomethane	5	< 5	< 5	< 5	< 5.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5	< 5.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5	< 5.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5.0	< 5.0
Chloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
Chloroform	7	< 5	< 5	< 5	< 5.0	< 1.0
Chloromethane	5	< 5	< 5	< 5	< 5.0	< 1.0
cis-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5	< 5.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5.0	< 5.0
Ethylbenzene	5	< 5	< 5	< 5	< 5.0	< 1.0
Methyl-Tert-Butylether	5	< 5	--	< 5	< 5.0	< 1.0
Methylene Chloride	5	< 5	< 5	< 5	< 5.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5	< 5.0	< 5.0
Tetrachloroethene	5	< 5	< 5	< 5	< 5.0	< 1.0
Toluene	5	< 5	< 5	< 5	< 5.0	< 1.0
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5.0	< 1.0
Trichloroethene	5	< 5	< 5	< 5	< 5.0	< 1.0
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5.0	< 5.0
Vinyl Chloride	2	< 2	< 2	< 2	< 2.0	< 1.0
o-Xylene	5	< 5	< 5	< 5	< 5.0	< 1.0
m,p-Xylene	5	< 5	< 5	< 5	< 5.0	< 1.0
Total VOCs (3)		**0**	**0**	**0**	**0**	**0**
Project VOCs (4)		**0**	**0**	**0**	**0**	**0**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and
in Groundwater Samples Collected from Monitoring
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	B30MW-1 12/31/2015	BCPMW-1 4/28/2009	BCPMW-2 4/28/2009	BCPMW-3 4/29/2009	BCPMW-4-1 4/17/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	< 5	< 10	< 25	< 25
1,1,2,2-Tetrachloroethane	5	< 1.0	< 5	< 10	< 25	< 25
1,1,2-Trichloroethane	1	< 1.0	< 5	< 10	< 25	< 25
1,1-Dichloroethane	5	< 1.0	**0.37 J**	**8 J**	**9.6 J**	**6.5 J**
1,1-Dichloroethene	5	< 1.0	< 5	**3.8 J**	**43**	**1.8 J**
1,2-Dichloroethane	0.6	< 1.0	< 5	**0.68 J**	< 25	< 25
1,2-Dichloropropane	1	< 1.0	< 5	< 10	< 25	< 25
2-Butanone	NE	< 10	< 50	< 100	< 250	< 250
2-Hexanone	50	< 5.0	< 50	< 100	< 250	< 250 J
4-Methyl-2-Pentanone	50	< 5.0	< 50	< 100	< 250	< 250 J
Acetone	NE	< 10	< 50 B	< 100	< 250	< 250 J
Benzene	1	< 0.50	< 0.7	< 1.4	< 3.5	< 3.5
Bromodichloromethane	50	< 1.0	< 5	< 10	< 25	< 25
Bromoform	50	< 1.0	< 5	< 10	< 25	< 25
Bromomethane	5	< 2.0	< 5	< 10	< 25	< 25
Carbon Disulfide	60	< 2.0	< 5	< 10	< 25	< 25
Carbon Tetrachloride	5	< 1.0	< 5	< 10	< 25	< 25
Chlorobenzene	5	< 1.0	< 5	< 10	< 25	< 25
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5	< 10	< 25	**17 J**
Chloroethane	5	< 1.0	< 5	< 10	< 25	< 25
Chloroform	7	< 1.0	**0.88 J**	< 10	< 25	< 25
Chloromethane	5	< 1.0	< 5	< 10	< 25	< 25
cis-1,2-Dichloroethene	5	< 1.0	**22**	**310**	**900**	**1800 D**
cis-1,3-Dichloropropene	0.4	< 1.0	< 5	< 10	< 25	< 25
Chlorodibromomethane	50	< 1.0	< 5	< 10	< 25	< 25
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 5	< 10	< 25	< 25
Ethylbenzene	5	< 1.0	< 5	< 10	< 25 B	< 25
Methyl-Tert-Butylether	5	< 1.0	--	--	--	--
Methylene Chloride	5	< 2.0	**0.52 J**	< 10	< 25	< 25
Styrene (Monomer)	5	< 1.0	< 5	< 10	< 25	< 25
Tetrachloroethene	5	< 1.0	< 5	**1.5 J**	< 25	< 25
Toluene	5	< 1.0	**0.33 J**	< 10	< 25 B	< 25
trans-1,2-Dichloroethene	5	< 1.0	**0.44 J**	**2.4 J**	**8.9 J**	**110**
trans-1,3-Dichloropropene	0.4	< 1.0	< 5	< 10	< 25	< 25
Trichloroethene	5	< 1.0	**190**	**180**	**470**	**22 J**
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5	< 10	< 25	< 25
Vinyl Chloride	2	< 1.0	< 2	**4.1**	**300**	**180**
o-Xylene	5	< 1.0	< 5	< 10	< 25 B	< 25
m,p-Xylene	5	< 1.0	< 5	< 10	< 25 B	< 25
Total VOCs (3)		**0**	**220**	**510**	**1700**	**2100**
Project VOCs (4)		**0**	**210**	**510**	**1700**	**2100**
1,4-Dioxane		**< 0.10**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-1 12/1/2009	BCPMW-4-1 10/4/2010	BCPMW-4-1 10/28/2011	BCPMW-4-1 10/3/2012	BCPMW-4-1 6/5/2013
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	**2.4 J**	**14 J**	**10 J**	**29**	**5.1**
1,1,2,2-Tetrachloroethane	5	< 5	< 25	< 25	< 25	< 5.0
1,1,2-Trichloroethane	1	0.38 J	< 25	< 25	**1.7 J**	**0.24 J**
1,1-Dichloroethane	5	**46**	**38**	**18 J**	**39**	**7.4**
1,1-Dichloroethene	5	**14**	**21 J**	**13 J**	**24 J**	**4.1 J**
1,2-Dichloroethane	0.6	**0.65 J**	< 25	**2.1 J**	**4.8 J**	**0.95 J**
1,2-Dichloropropane	1	**4.7 J**	**3.8 J**	**1.9 J**	**5.1 J**	**0.95 J**
2-Butanone	NE	< 50	< 250	< 250	< 250	< 50
2-Hexanone	50	< 50	< 250	< 250	< 250	< 50
4-Methyl-2-Pentanone	50	< 50	< 250	< 250	< 250	< 50
Acetone	NE	< 50	< 250	< 250B	< 250	< 50
Benzene	1	**0.44 J**	< 3.5	< 3.5	< 3.5	< 0.70
Bromodichloromethane	50	< 5	< 25	< 25	< 25	< 5.0
Bromoform	50	< 5	< 25	< 25	< 25	< 5.0
Bromomethane	5	R	< 25	< 25	< 25	< 5.0
Carbon Disulfide	60	< 5	< 25	< 25	< 25	< 5.0
Carbon Tetrachloride	5	< 5	< 25	< 25	< 25	< 5.0
Chlorobenzene	5	< 5	< 25	< 25	< 25	< 5.0
Chlorodifluoromethane (Freon 22)	NE	**6.2**	**4.3 J**	**2.5 J**	< 25	**1.1 J**
Chloroethane	5	2.4 J	4.1 J	< 25	**1.6 J**	**0.46 J**
Chloroform	7	< 5	< 25	< 25	< 25	< 5.0
Chloromethane	5	R	< 25	< 25	< 25	< 5.0
cis-1,2-Dichloroethene	5	**750 D**	**510**	**500**	**840**	**310 D**
cis-1,3-Dichloropropene	0.4	< 5	< 25	< 25	< 25	< 5.0
Chlorodibromomethane	50	< 5	< 25	< 25	< 25	< 5.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 25	< 25	< 25	< 5.0
Ethylbenzene	5	< 5	< 25	< 25	< 25	< 5.0
Methyl-Tert-Butylether	5	--	< 25	< 25	< 25	< 5.0
Methylene Chloride	5	< 5	< 25	< 25 B	< 25	< 5.0
Styrene (Monomer)	5	< 5	< 25	< 25	< 25	< 5.0
Tetrachloroethene	5	0.64 J	< 25	< 25	< 25	**0.37 J**
Toluene	5	< 5	< 25	< 25	< 25	< 5.0
trans-1,2-Dichloroethene	5	**2.5 J**	**3.9 J**	**1.3 J**	**2.2 J**	**0.78 J**
trans-1,3-Dichloropropene	0.4	< 5	< 25	< 25	< 25	< 5.0
Trichloroethene	5	**170**	**45**	**43**	**110**	**16**
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 25	< 25	< 25	< 5.0
Vinyl Chloride	2	**540 D**	**220**	**32**	**420**	**47**
o-Xylene	5	**8**	< 25	< 25	< 25	< 5.0
m,p-Xylene	5	< 5	< 25	< 25	< 25	< 5.0
Total VOCs (3)		**1500**	**860**	**620**	**1500**	**390**
Project VOCs (4)		**1500**	**850**	**619.6**	**1500**	**390**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-1 11/17/2014	BCPMW-4-1 10/8/2015	BCPMW-4-1 12/30/2015	BCPMW-4-2 4/17/2009	BCPMW-4-2 12/4/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	**2.4**	**4.2**	***7.3***	< 250	< 10
1,1,2,2-Tetrachloroethane	5	< 1.0		*< 1.0*	< 250	< 10
1,1,2-Trichloroethane	1	**0.42 J**	**1.1**	***1.7***	< 250	< 10
1,1-Dichloroethane	5	**7.3**	**13.3**	***27.1***	**57 J**	**8.7 J**
1,1-Dichloroethene	5	**1.1**	**0.98 J**	***1.7***	**34 J**	**2.7 J**
1,2-Dichloroethane	0.6	**0.70 J**	**0.97 J**	***1.3***	< 250	< 10
1,2-Dichloropropane	1	**0.61 J**	**0.95**	***1.5***	< 250	< 10
2-Butanone	NE	< 10	< 10	*< 10*	< 2500	< 100
2-Hexanone	50	< 5.0	< 5.0	*< 5.0*	< 2500 J	< 100
4-Methyl-2-Pentanone	50	< 5.0	< 5.0	*< 5.0*	< 2500 J	< 100
Acetone	NE	< 10	< 10	*< 10*	< 2500 J	< 100
Benzene	1	< 1.0	< 0.50	*< 0.50*	< 35	< 1.4
Bromodichloromethane	50	< 1.0	< 1.0	*< 1.0*	< 250	< 10
Bromoform	50	< 4.0	< 1.0	*< 1.0*	< 250	< 10
Bromomethane	5	< 2.0	< 2.0	*< 2.0*	< 250	< 10
Carbon Disulfide	60	< 2.0	< 2.0	*< 2.0*	< 250	< 10
Carbon Tetrachloride	5	< 1.0	< 1.0	*< 1.0*	< 250	< 10
Chlorobenzene	5	< 1.0	< 1.0	*< 1.0*	< 250	< 10
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	*< 5.0*	< 250	**0.8 J**
Chloroethane	5	< 1.0	< 1.0	*< 1.0*	< 250	**1.1 J**
Chloroform	7	**0.61 J**	**0.70 J**	***1.1***	< 250	< 10
Chloromethane	5	< 1.0	< 1.0	*< 1.0*	< 250	R
cis-1,2-Dichloroethene	5	**207 D**	**156**	***252 D***	**18000 D**	**270**
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 250	< 10
Chlorodibromomethane	50	< 1.0	< 1.0	*< 1.0*	< 250	< 10
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 2.0	*< 2.0*	< 250	< 10
Ethylbenzene	5	< 1.0	< 1.0	*< 1.0*	**62 J**	**0.78 J**
Methyl-Tert-Butylether	5	< 1.0	< 1.0	*< 1.0*	--	--
Methylene Chloride	5	< 2.0	< 2.0	*< 2.0*	< 250	< 10
Styrene (Monomer)	5	< 5.0	< 1.0	*< 1.0*	< 250	< 10
Tetrachloroethene	5	**0.80 J**	**1.1**	***1.1***	< 250	**0.82 J**
Toluene	5	< 1.0	< 1.0	*< 1.0*	**2400**	< 10 B
trans-1,2-Dichloroethene	5	**0.59 J**	< 1.0	***0.86 J***	< 250	**1.3 J**
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	*< 1.0*	< 250	< 10
Trichloroethene	5	**34.7**	**68.1**	***81.5***	< 250	**310**
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	*< 5.0*	< 250	< 10
Vinyl Chloride	2	**21**	**13**	***197***	**6300**	**58**
o-Xylene	5	< 1.0	< 1.0	***0.70 J***	**110 J**	< 10 B
m,p-Xylene	5	< 1.0	< 1.0	*< 1.0*	**190 J**	< 10 B
Total VOCs (3)		**280**	**260**	***570***	**27000**	**660**
Project VOCs (4)		**280**	**260**	***570***	**27000**	**650**
1,4-Dioxane		**--**	**--**	***37.7***	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-2 10/7/2010	BCPMW-4-2 10/28/2011	BCPMW-4-2 10/3/2012	BCPMW-4-2 6/5/2013	BCPMW-4-2 11/18/2014
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	**0.33 J**	**0.23 J**	**0.22 J**	< 1.0
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5.0	< 1.0
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5.0	< 1.0
1,1-Dichloroethane	5	**7.3**	**2.6 J**	**1.4 J**	**1.5 J**	< 1.0
1,1-Dichloroethene	5	**1.9 J**	**1.1 J**	**0.8 J**	**0.49 J**	< 1.0
1,2-Dichloroethane	0.6	**0.91 J**	**0.85 J**	**0.45 J**	**0.52 J**	< 1.0
1,2-Dichloropropane	1	**0.9 J**	**0.39 J**	< 5	< 5.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50	< 50	< 10
2-Hexanone	50	< 50	< 50	< 50	< 50	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 5.0
Acetone	NE	< 50 B	< 50	< 50	**1.8 J**	< 10
Benzene	1	< 0.7	< 0.7 U	< 0.7	< 0.70	< 1.0
Bromodichloromethane	50	< 5	< 5	< 5	< 5.0	< 1.0
Bromoform	50	< 5	< 5	< 5	< 5.0	< 4.0
Bromomethane	5	< 5	< 5	< 5	< 5.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5	< 5.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5	< 5.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5.0	< 5.0
Chloroethane	5	**0.79 J**	< 5	< 5	< 5.0	< 1.0
Chloroform	7	**0.96 J**	**0.62 J**	**0.54 J**	**3.3 J**	**3.2**
Chloromethane	5	< 5	< 5	< 5	< 5.0	< 1.0
cis-1,2-Dichloroethene	5	**99**	**59**	**70**	**47**	**8.6**
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5	< 5.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5.0	< 5.0
Ethylbenzene	5	< 5	< 5	< 5	< 5.0	< 1.0
Methyl-Tert-Butylether	5	**0.35 J**	**0.28 J**	**0.29 J**	**0.26 J**	< 1.0
Methylene Chloride	5	< 5	< 5	< 5	< 5.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5	< 5.0	< 5.0
Tetrachloroethene	5	**0.73 J**	**0.59 J**	**0.91 J**	**0.63 J**	< 1.0
Toluene	5	< 5	< 5	< 5	< 5.0	< 1.0
trans-1,2-Dichloroethene	5	**0.65 J**	**0.41 J**	**0.5 J**	**0.40 J**	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5.0	< 1.0
Trichloroethene	5	**66**	**50**	**68**	**56**	**9.1**
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5.0	< 5.0
Vinyl Chloride	2	**54**	**20**	**9.5**	**9.7**	**1.6**
o-Xylene	5	< 5	< 5	< 5	< 5.0	< 5.0
m,p-Xylene	5	< 5	< 5	< 5	< 5.0	< 5.0
Total VOCs (3)		**230**	**140**	**150**	**120**	**23**
Project VOCs (4)		**230**	**130**	**150**	**120**	**19**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-2 10/8/2015	BCPMW-4-2 12/31/2015	BCPMW-4-2 (REP) 12/31/2015	BCPMW-4-3 4/17/2009
	NYSDEC SCGs				
1,1,1-Trichloroethane	5	< 1.0	*< 1.0*	*< 1.0*	< 5
1,1,2,2-Tetrachloroethane	5	< 1.0	*< 1.0*	*< 1.0*	< 5
1,1,2-Trichloroethane	1	< 1.0	*< 1.0*	*< 1.0*	< 5
1,1-Dichloroethane	5	**0.48 J**	***0.23 J***	***0.24 J***	< 5
1,1-Dichloroethene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
1,2-Dichloroethane	0.6	< 1.0	*< 1.0*	*< 1.0*	< 5
1,2-Dichloropropane	1	< 1.0	*< 1.0*	*< 1.0*	< 5
2-Butanone	NE	< 10	*< 10*	*< 10*	< 50
2-Hexanone	50	< 5.0	*< 5.0*	*< 5.0*	< 50 J
4-Methyl-2-Pentanone	50	< 5.0	*< 5.0*	*< 5.0*	< 50 J
Acetone	NE	< 10	*< 10*	*< 10*	< 50 J
Benzene	1	< 0.50	*< 0.50*	*< 0.50*	< 0.7
Bromodichloromethane	50	< 1.0	*< 1.0*	*< 1.0*	< 5
Bromoform	50	< 1.0	*< 1.0*	*< 1.0*	< 5
Bromomethane	5	< 2.0	*< 2.0*	*< 2.0*	< 5
Carbon Disulfide	60	< 2.0	*< 2.0*	*< 2.0*	< 5
Carbon Tetrachloride	5	< 1.0	*< 1.0*	*< 1.0*	< 5
Chlorobenzene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	*< 5.0*	*< 5.0*	< 5
Chloroethane	5	< 1.0	*< 1.0*	*< 1.0*	< 5
Chloroform	7	**1.3**	***2.0***	***2.0***	**0.53 J**
Chloromethane	5	< 1.0	*< 1.0*	*< 1.0*	< 5
cis-1,2-Dichloroethene	5	**29.7**	***13.3***	***13.2***	**0.37 J**
cis-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	*< 1.0*	< 5
Chlorodibromomethane	50	< 1.0	*< 1.0*	*< 1.0*	< 5
Dichlorodifluoromethane (Freon 12)	5	< 2.0	*< 2.0*	*< 2.0*	< 5
Ethylbenzene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
Methyl-Tert-Butylether	5	< 1.0	*< 1.0*	*< 1.0*	--
Methylene Chloride	5	< 2.0	*< 2.0*	*< 2.0*	< 5
Styrene (Monomer)	5	< 1.0	*< 1.0*	*< 1.0*	< 5
Tetrachloroethene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
Toluene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
trans-1,2-Dichloroethene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	*< 1.0*	< 5
Trichloroethene	5	**25.6**	***16.0***	***16.3***	**0.56 J**
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	*< 5.0*	*< 5.0*	< 5
Vinyl Chloride	2	**3.7**	***0.96 J***	***0.92 J***	< 2
o-Xylene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
m,p-Xylene	5	< 1.0	*< 1.0*	*< 1.0*	< 5
Total VOCs (3)		**61**	***32***	***33***	**1.5**
Project VOCs (4)		**59**	***30***	***31***	**0.93**
1,4-Dioxane		**--**	***0.858***	***0.982***	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-3 12/1/2009	BCPMW-4-3 10/7/2010	BCPMW-4-3 10/28/2011	BCPMW-4-3 10/3/2012
	NYSDEC SCGs				
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5
Chloroform	7	**0.32 J**	< 5	< 5	**0.2 J**
Chloromethane	5	R	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5
Chlorodibromomethane	50	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether	5	--	< 5	< 5	< 5
Methylene Chloride	5	< 5	< 5	< 5	< 5
Styrene (Monomer)	5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	**0.27 J**	**0.3 J**
Toluene	5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5
Trichloroethene	5	**0.51 J**	**0.41 J**	**0.74 J**	**0.84 J**
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	**0.38 J**	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2
o-Xylene	5	< 5	< 5	< 5	< 5
m,p-Xylene	5	< 5	< 5	< 5	< 5
Total VOCs (3)		**0.83**	**0.41**	**1.4**	**1.3**
Project VOCs (4)		**0.51**	**0.41**	**1.01**	**1.14**
1,4-Dioxane		**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-3 (REP) 6/5/2013	BCPMW-4-3 6/5/2013	BCPMW-4-3 11/17/2014	BCPMW-4-3 12/31/2015
	NYSDEC SCGs				
1,1,1-Trichloroethane	5	< 5.0	< 5.0	< 1.0	*< 1.0*
1,1,2,2-Tetrachloroethane	5	< 5.0	< 5.0	< 1.0	*< 1.0*
1,1,2-Trichloroethane	1	< 5.0	< 5.0	< 1.0	*< 1.0*
1,1-Dichloroethane	5	< 5.0	< 5.0	< 1.0	*< 1.0*
1,1-Dichloroethene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
1,2-Dichloroethane	0.6	< 5.0	< 5.0	< 1.0	*< 1.0*
1,2-Dichloropropane	1	< 5.0	< 5.0	< 1.0	*< 1.0*
2-Butanone	NE	< 50	< 50	< 10	*< 10*
2-Hexanone	50	< 50	< 50	< 5.0	*< 5.0*
4-Methyl-2-Pentanone	50	< 50	< 50	< 5.0	*< 5.0*
Acetone	NE	< 50	< 50	< 10	*< 10*
Benzene	1	< 0.70	< 0.70	< 1.0	*< 0.50*
Bromodichloromethane	50	< 5.0	< 5.0	< 1.0	*< 1.0*
Bromoform	50	< 5.0	< 5.0	< 4.0	*< 1.0*
Bromomethane	5	< 5.0	< 5.0	< 2.0	*< 2.0*
Carbon Disulfide	60	< 5.0	< 5.0	< 2.0	*< 2.0*
Carbon Tetrachloride	5	< 5.0	< 5.0	< 1.0	*< 1.0*
Chlorobenzene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	*< 5.0 J*
Chloroethane	5	< 5.0	< 5.0	< 1.0	*< 1.0*
Chloroform	7	**0.97 J**	**1.1 J**	**0.58 J**	*< 1.0*
Chloromethane	5	< 5.0	< 5.0	< 1.0	*< 1.0*
cis-1,2-Dichloroethene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
cis-1,3-Dichloropropene	0.4	< 5.0	< 5.0	< 1.0	*< 1.0*
Chlorodibromomethane	50	< 5.0	< 5.0	< 1.0	*< 1.0*
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 5.0	< 5.0	*< 2.0*
Ethylbenzene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
Methyl-Tert-Butylether	5	< 5.0	< 5.0	< 1.0	*< 1.0*
Methylene Chloride	5	< 5.0	< 5.0	< 2.0	*< 2.0*
Styrene (Monomer)	5	< 5.0	< 5.0	< 5.0	*< 1.0*
Tetrachloroethene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
Toluene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
trans-1,2-Dichloroethene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
trans-1,3-Dichloropropene	0.4	< 5.0	< 5.0	< 1.0	*< 1.0*
Trichloroethene	5	**0.34 J**	**0.39 J**	< 1.0	*< 1.0*
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	*< 5.0 J*
Vinyl Chloride	2	< 2.0	< 2.0	< 1.0	*< 1.0*
o-Xylene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
m,p-Xylene	5	< 5.0	< 5.0	< 1.0	*< 1.0*
Total VOCs (3)		**1.3**	**1.5**	**0.58**	***0***
Project VOCs (4)		**0.34**	**0.39**	**0**	***0***
1,4-Dioxane		**--**	**--**	**--**	***0.263***

Table 12
Concentrations of Volatile Organic Compounds and
in Groundwater Samples Collected from Monitoring
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-5-1 4/23/2009	BCPMW-6-1 4/20/2009	BCPMW-6-1 12/4/2009	BCPMW-6-1 10/6/2010	BCPMW-6-1 10/31/2011
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 100	< 5	< 5	< 100	< 250
1,1,2,2-Tetrachloroethane	5	< 100	< 5	< 5	< 100	< 250
1,1,2-Trichloroethane	1	< 100	< 5	< 5	< 100	< 250
1,1-Dichloroethane	5	< 100	**0.3 J**	< 5	< 100	< 250
1,1-Dichloroethene	5	**21 J**	< 5	< 5	< 100	< 250
1,2-Dichloroethane	0.6	< 100	< 5	< 5	< 100	< 250
1,2-Dichloropropane	1	< 100	< 5	< 5	< 100	< 250
2-Butanone	NE	< 1000	< 50	< 50	< 1000	< 2500
2-Hexanone	50	< 1000	< 50 J	< 50	< 1000	< 2500
4-Methyl-2-Pentanone	50	< 1000	< 50 J	< 50	< 1000	< 2500
Acetone	NE	< 1000	< 50 J	< 50	< 1000	< 2500
Benzene	1	< 14	< 0.7	< 0.7	< 14	< 35
Bromodichloromethane	50	< 100	< 5	< 5	< 100	< 250
Bromoform	50	< 100	< 5	< 5	< 100	< 250
Bromomethane	5	< 100	< 5	R	< 100	< 250
Carbon Disulfide	60	< 100	< 5	< 5	< 100	< 250
Carbon Tetrachloride	5	< 100	< 5	< 5	< 100	< 250
Chlorobenzene	5	< 100	< 5	< 5	< 100	< 250
Chlorodifluoromethane (Freon 22)	NE	< 100	**4500 D**	**1700 EJ**	**10000 D**	**7100**
Chloroethane	5	< 100	< 5	< 5	< 100	< 250
Chloroform	7	< 100	**1.7 J**	**0.32 J**	< 100	< 250
Chloromethane	5	< 100	< 5	R	< 100	< 250
cis-1,2-Dichloroethene	5	**960**	**21**	**1.7 J**	< 100	< 250
cis-1,3-Dichloropropene	0.4	< 100	< 5	< 5	< 100	< 250
Chlorodibromomethane	50	< 100	< 5	< 5	< 100	< 250
Dichlorodifluoromethane (Freon 12)	5	< 100	< 5	< 5	< 100	< 250
Ethylbenzene	5	**48 J**	< 5	< 5	< 100	< 250
Methyl-Tert-Butylether	5	--	--	--	<100	< 250
Methylene Chloride	5	< 100	< 5	< 5	< 100	< 250
Styrene (Monomer)	5	< 100	< 5	< 5	< 100	< 250
Tetrachloroethene	5	< 100	**0.34 J**	< 5	< 100	< 250
Toluene	5	**2700**	< 5	< 5	< 100	< 250
trans-1,2-Dichloroethene	5	< 100	< 5	< 5	< 100	< 250
trans-1,3-Dichloropropene	0.4	< 100	< 5	< 5	< 100	< 250
Trichloroethene	5	**220**	**4.9 J**	**1.6 J**	< 100	< 250
Trichlorotrifluoroethane (Freon 113)	5	< 100	< 5	< 5	< 100	< 250
Vinyl Chloride	2	**330**	< 2	< 2	< 40	< 100
o-Xylene	5	**40 J**	< 5	< 5	< 100	< 250
m,p-Xylene	5	**110**	< 5	< 5	< 100	< 250
Total VOCs (3)		**4400**	**4500**	**1700**	**10000**	**7100**
Project VOCs (4)		**4400**	**26.54**	**2.3**	**0**	**0**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-1 10/3/2012	BCPMW-6-1 6/7/2013	BCPMW-6-1 11/11/2014	BCPMW-6-1 12/23/2015	BCPMW-6-2 5/8/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 100	< 13	< 1.0	*< 1.0*	< 5
1,1,2,2-Tetrachloroethane	5	< 100	< 13	< 1.0	*< 1.0*	< 5
1,1,2-Trichloroethane	1	< 100	< 13	< 1.0	*< 1.0*	< 5
1,1-Dichloroethane	5	< 100	< 13	< 1.0	*< 1.0*	**0.37 J**
1,1-Dichloroethene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
1,2-Dichloroethane	0.6	< 100	< 13	< 1.0	*< 1.0*	< 5
1,2-Dichloropropane	1	< 100	< 13	< 1.0	*< 1.0*	< 5
2-Butanone	NE	< 1000	< 130	< 10	*< 10*	< 50
2-Hexanone	50	< 1000	< 130	< 5.0	*< 5.0*	< 50
4-Methyl-2-Pentanone	50	< 1000	< 130	< 5.0	*< 5.0*	< 50
Acetone	NE	< 1000	< 130	< 10	*< 10*	< 50
Benzene	1	< 14	< 1.8	< 1.0	*< 0.50*	< 0.7
Bromodichloromethane	50	< 100	< 13	< 1.0	*< 1.0*	< 5
Bromoform	50	< 100	< 13	< 4.0	*< 1.0*	< 5
Bromomethane	5	< 100	< 13	< 2.0	*< 2.0*	< 5
Carbon Disulfide	60	< 100	< 13	< 2.0	*< 2.0*	< 5
Carbon Tetrachloride	5	< 100	< 13	< 1.0	*< 1.0*	< 5
Chlorobenzene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
Chlorodifluoromethane (Freon 22)	NE	**2100**	**400**	< 5.0	*< 5.0*	< 5
Chloroethane	5	< 100	< 13	< 1.0	*< 1.0*	< 5
Chloroform	7	< 100	< 13	< 1.0	*< 1.0*	**0.53 J**
Chloromethane	5	< 100	< 13	< 1.0	*< 1.0*	< 5
cis-1,2-Dichloroethene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
cis-1,3-Dichloropropene	0.4	< 100	< 13	< 1.0	*< 1.0*	< 5
Chlorodibromomethane	50	< 100	< 13	< 1.0	*< 1.0*	< 5
Dichlorodifluoromethane (Freon 12)	5	< 100	< 13	< 5.0	*< 2.0*	< 5
Ethylbenzene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
Methyl-Tert-Butylether	5	< 100	< 13	< 1.0	*< 1.0*	--
Methylene Chloride	5	< 100	< 13	< 2.0	*< 2.0*	< 5
Styrene (Monomer)	5	< 100	< 13	< 5.0	*< 1.0*	< 5
Tetrachloroethene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
Toluene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
trans-1,2-Dichloroethene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
trans-1,3-Dichloropropene	0.4	< 100	< 13	< 1.0	*< 1.0*	< 5
Trichloroethene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 100	< 13	< 5.0	*< 5.0*	< 5
Vinyl Chloride	2	< 40	< 5.0	< 1.0	*< 1.0*	< 2
o-Xylene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
m,p-Xylene	5	< 100	< 13	< 1.0	*< 1.0*	< 5
Total VOCs (3)		**2100**	**400**	**0**	***0***	**0.9**
Project VOCs (4)		**0**	**0**	**0**	***0***	**0.37**
1,4-Dioxane		**--**	**--**	**--**	***< 0.10***	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-2 12/4/2009	BCPMW-6-2 10/6/2010	BCPMW-6-2 10/31/2011	BCPMW-6-2 10/3/2012	BCPMW-6-2 6/5/2013
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	**0.78 J**	< 5	< 5	< 5	< 5.0
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5.0
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5.0
1,1-Dichloroethane	5	**0.65 J**	**0.47 J**	**0.41 J**	**0.23 J**	**0.31 J**
1,1-Dichloroethene	5	**0.44 J**	< 5	**0.3 J**	< 5	< 5.0 J
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5.0
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5.0
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.70 J
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5.0
Bromoform	50	< 5	< 5	< 5	< 5	< 5.0
Bromomethane	5	R	< 5	< 5	< 5	< 5.0
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5.0
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5	< 5.0
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5.0 J
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	**0.64 J**	< 5.0
Chloroethane	5	< 5	< 5	< 5	< 5	< 5.0
Chloroform	7	< 5	**0.41 J**	**0.3 J**	**0.38 J**	**0.93 J**
Chloromethane	5	R	< 5	< 5	< 5	< 5.0
cis-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0
Chlorodibromomethane	50	< 5	< 5	< 5	< 5	< 5.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5.0
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5.0
Methyl-Tert-Butylether	5	--	<5	**0.33 J**	**0.24 J**	**0.36 J**
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5.0
Styrene (Monomer)	5	< 5	< 5	< 5	< 5	< 5.0
Tetrachloroethene	5	**0.79 J**	**2.1 J**	**1.8 J**	**1.6 J**	**1.3 J**
Toluene	5	< 5	< 5	< 5	< 5	< 5.0 J
trans-1,2-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5.0
Trichloroethene	5	**0.45 J**	< 5	< 5	< 5	< 5.0 J
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5.0
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2.0
o-Xylene	5	< 5	< 5	< 5	< 5	< 5.0
m,p-Xylene	5	< 5	< 5	< 5	< 5	< 5.0
Total VOCs (3)		**3.1**	**2.98**	**3.1**	**3.1**	**2.9**
Project VOCs (4)		**3.1**	**2.59**	**2.51**	**1.83**	**1.6**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-2 11/11/2014	BCPMW-6-2 12/23/2015	BCPMW-7-1 4/20/2009	BCPMW-7-1 12/1/2009	BCPMW-7-1 10/7/2010
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 1.0	*< 1.0*	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 1.0	*< 1.0*	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 1.0	*< 1.0*	< 5	< 5	< 5
1,1-Dichloroethane	5	**0.41 J**	*< 1.0*	< 5	< 5	< 5
1,1-Dichloroethene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 1.0	*< 1.0*	< 5	< 5	< 5
1,2-Dichloropropane	1	< 1.0	*< 1.0*	< 5	< 5	< 5
2-Butanone	NE	< 10	*< 10*	< 50	< 50	< 50
2-Hexanone	50	< 5.0	*< 5.0*	< 50 J	< 50	< 50
4-Methyl-2-Pentanone	50	< 5.0	*< 5.0*	< 50 J	< 50	< 50
Acetone	NE	< 10	*< 10*	< 50	< 50	< 50
Benzene	1	< 1.0	*< 0.50*	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 1.0	*< 1.0*	< 5	< 5	< 5
Bromoform	50	< 4.0	*< 1.0*	< 5	< 5	< 5
Bromomethane	5	< 2.0	*< 2.0*	< 5	R	< 5
Carbon Disulfide	60	< 2.0	*< 2.0*	< 5	< 5	< 5
Carbon Tetrachloride	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Chlorobenzene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5.0	*< 5.0*	**2.6 J**	**1.5 J**	**5.2**
Chloroethane	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Chloroform	7	**0.30 J**	*< 1.0*	< 5	< 5	< 5
Chloromethane	5	< 1.0	*< 1.0*	< 5	R	< 5
cis-1,2-Dichloroethene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
cis-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	< 5	< 5	< 5
Chlorodibromomethane	50	< 1.0	*< 1.0*	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5.0	*< 2.0*	< 5	< 5	< 5
Ethylbenzene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Methyl-Tert-Butylether	5	**0.26 J**	*< 1.0*	--	--	< 5
Methylene Chloride	5	< 2.0	*< 2.0*	< 5	< 5	< 5
Styrene (Monomer)	5	< 5.0	*< 1.0*	< 5	< 5	< 5
Tetrachloroethene	5	**0.35 J**	*< 1.0*	< 5	< 5	< 5
Toluene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 1.0	*< 1.0*	< 5	< 5	< 5
Trichloroethene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	*< 5.0*	< 5	< 5	< 5
Vinyl Chloride	2	< 1.0	*< 1.0*	< 2	< 2	< 2
o-Xylene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
m,p-Xylene	5	< 1.0	*< 1.0*	< 5	< 5	< 5
Total VOCs (3)		**1.3**	***0***	**2.6**	**1.5**	**5.2**
Project VOCs (4)		**0.76**	***0***	**0**	**0**	**0**
1,4-Dioxane		**--**	***< 0.10***	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring W
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-7-1 11/1/2011	BCPMW-7-1 10/4/2012	BCPMW-7-1 6/7/2013	BCPMW-7-1 11/18/2014	BCPMW-7-1 12/22/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
1,1,2-Trichloroethane	1	< 5	< 5	< 5.0	< 1.0	*< 1.0*
1,1-Dichloroethane	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
1,1-Dichloroethene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
1,2-Dichloroethane	0.6	< 5	< 5	< 5.0	< 1.0	*< 1.0*
1,2-Dichloropropane	1	< 5	< 5	< 5.0	< 1.0	*< 1.0*
2-Butanone	NE	< 50	< 50	< 50	< 10 J	*< 10*
2-Hexanone	50	< 50	< 50	< 50	< 5.0 J	*< 5.0*
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 5.0	*< 5.0*
Acetone	NE	< 50	< 50	< 50	< 10 J	*< 10*
Benzene	1	< 0.7	< 0.7	< 0.70	< 1.0	*< 0.50*
Bromodichloromethane	50	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Bromoform	50	< 5	< 5	< 5.0	< 4.0	*< 1.0*
Bromomethane	5	< 5	< 5	< 5.0	< 2.0	*< 2.0*
Carbon Disulfide	60	< 5	< 5	< 5.0	< 2.0	*< 2.0*
Carbon Tetrachloride	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Chlorobenzene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Chlorodifluoromethane (Freon 22)	NE	**9.2**	**3.6 J**	**2.5 J**	< 5.0	*< 5.0*
Chloroethane	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Chloroform	7	< 5	**0.37 J**	**0.29 J**	**0.25 J**	*< 1.0*
Chloromethane	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
cis-1,2-Dichloroethene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Chlorodibromomethane	50	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5.0	< 5.0	*< 2.0*
Ethylbenzene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Methyl-Tert-Butylether	5	**0.22 J**	**0.26 J**	**0.22 J**	< 1.0	*< 1.0*
Methylene Chloride	5	< 5	< 5	< 5.0	< 2.0	*< 2.0*
Styrene (Monomer)	5	< 5	< 5	< 5.0	< 5.0	*< 1.0*
Tetrachloroethene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Toluene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
trans-1,2-Dichloroethene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Trichloroethene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5.0	< 5.0	*< 5.0*
Vinyl Chloride	2	< 2	< 2	< 2.0	< 1.0	*< 1.0*
o-Xylene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
m,p-Xylene	5	< 5	< 5	< 5.0	< 1.0	*< 1.0*
Total VOCs (3)		**9.4**	**4.2**	**3.0**	**0.25**	***0***
Project VOCs (4)		**0.2**	**0**	**0**	**0**	***0***
1,4-Dioxane		**--**	**--**	**--**	**--**	***< 0.10***

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring W
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-200-1 4/29/2009	MW-200-1 12/2/2009	MW-200-1 10/5/2010	MW-200-1 11/3/2011	MW-200-1 10/4/2012
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	**0.79 J**	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50 B	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	R	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5
Carbon Tetrachloride	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	**2.3 J**	**2.3 J**	**0.5 J**	**0.21 J**	< 5
Chloromethane	5	< 5	R	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	**38**	**5.7**	**3.5 J**	**11**	**1.5 J**
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Chlorodibromomethane	50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether	5	--	--	< 5	< 5	< 5
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5
Styrene (Monomer)	5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	**0.54 J**	< 5	< 5	**0.43 J**	< 5
Toluene	5	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	**0.3 J**	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene	5	**34**	**12**	**7**	**20**	**3.8 J**
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2
o-Xylene	5	< 5	< 5	< 5	< 5	< 5
m,p-Xylene	5	< 5	< 5	< 5	< 5	< 5
Total VOCs (3)		**75.93**	**20**	**11**	**31.64**	**5.3**
Project VOCs (4)		**73.6**	**17.7**	**10.5**	**31.43**	**5.3**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
**in Groundwater Samples Collected from Monitoring **
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-200-1 5/31/2013	MW-200-1 11/18/2014	MW-200-1 12/24/2015	MW-201-1 5/1/2009	MW-201-1 12/2/2009
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 5.0	< 1.0	< *1.0*	**5.5 J**	**3.3 J**
1,1,2,2-Tetrachloroethane	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
1,1,2-Trichloroethane	1	< 5.0	< 1.0	< *1.0*	< 25	< 50
1,1-Dichloroethane	5	< 5.0	< 1.0	< *1.0*	**10 J**	**9 J**
1,1-Dichloroethene	5	< 5.0	< 1.0	< *1.0*	**7.9 J**	**8.1 J**
1,2-Dichloroethane	0.6	< 5.0	< 1.0	< *1.0*	< 25	< 50
1,2-Dichloropropane	1	< 5.0	< 1.0	< *1.0*	< 25	< 50
2-Butanone	NE	< 50	< 10	< *10*	< 250	< 500
2-Hexanone	50	< 50	< 5.0	< *5.0*	< 250	< 500
4-Methyl-2-Pentanone	50	< 50	< 5.0	< *5.0*	< 250	< 500
Acetone	NE	< 50	< 10	< *10*	< 250 B	< 500
Benzene	1	< 0.70	< 1.0	< *0.50*	< 3.5	< 7
Bromodichloromethane	50	< 5.0	< 1.0	< *1.0*	< 25	< 50
Bromoform	50	< 5.0	< 4.0	< *1.0*	< 25	< 50
Bromomethane	5	< 5.0	< 2.0	< *2.0*	< 25	< 50
Carbon Disulfide	60	< 5.0	< 2.0	< *2.0*	< 25	< 50
Carbon Tetrachloride	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
Chlorobenzene	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< *5.0*	< 25	< 50
Chloroethane	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
Chloroform	7	< 5.0	< 1.0	< *1.0*	< 25	< 50
Chloromethane	5	< 5.0	< 1.0	< *1.0*	< 25	R
cis-1,2-Dichloroethene	5	**0.41 J**	< 1.0	< *1.0*	**970 D**	**1300**
cis-1,3-Dichloropropene	0.4	< 5.0	< 1.0	< *1.0*	< 25	< 50
Chlorodibromomethane	50	< 5.0	< 1.0	< *1.0*	< 25	< 50
Dichlorodifluoromethane (Freon 12)	5	< 5.0	< 5.0	< *2.0*	< 25	< 50
Ethylbenzene	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
Methyl-Tert-Butylether	5	< 5.0	< 1.0	< *1.0*	--	--
Methylene Chloride	5	< 5.0	< 2.0	< *2.0*	< 25	< 50
Styrene (Monomer)	5	< 5.0	< 5.0	< *1.0*	< 25	< 50
Tetrachloroethene	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
Toluene	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
trans-1,2-Dichloroethene	5	< 5.0	< 1.0	< *1.0*	**2.7 J**	**3.5 J**
trans-1,3-Dichloropropene	0.4	< 5.0	< 1.0	< *1.0*	< 25	< 50
Trichloroethene	5	**1.3 J**	< 1.0	< *1.0*	**160**	**230**
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< *5.0*	< 25	< 50
Vinyl Chloride	2	< 2.0	< 1.0	< *1.0*	< 10	**38**
o-Xylene	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
m,p-Xylene	5	< 5.0	< 1.0	< *1.0*	< 25	< 50
Total VOCs (3)		**1.7**	**0**	***0***	**1200**	**1600**
Project VOCs (4)		**1.7**	**0**	***0***	**1200**	**1600**
1,4-Dioxane		**--**	**--**	***0.309***	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-201-1 10/5/2010	MW-201-1 11/3/2011	MW-201-1 10/4/2012	MW-201-1 5/31/2013	MW-201-1 11/20/2014
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	< 50	< 5	< 5	< 5.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 50	< 5	< 5	< 5.0	< 1.0
1,1,2-Trichloroethane	1	< 50	< 5	< 5	< 5.0	< 1.0
1,1-Dichloroethane	5	**14 J**	**0.51 J**	**1.2 J**	< 5.0	< 1.0
1,1-Dichloroethene	5	**6.9 J**	**0.21 J**	**0.65 J**	< 5.0	< 1.0
1,2-Dichloroethane	0.6	< 50	< 5	< 5	< 5.0	< 1.0
1,2-Dichloropropane	1	< 50	< 5	< 5	< 5.0	< 1.0
2-Butanone	NE	< 500	< 50	< 50	< 50	< 10
2-Hexanone	50	< 500	< 50	< 50	< 50	< 5.0
4-Methyl-2-Pentanone	50	< 500	< 50	< 50	< 50	< 5.0
Acetone	NE	< 500	< 50	< 50	< 50	< 10
Benzene	1	< 7	< 0.7	< 0.7	< 0.70	< 1.0
Bromodichloromethane	50	< 50	< 5	< 5	< 5.0	< 1.0
Bromoform	50	< 50	< 5	< 5	< 5.0	< 4.0
Bromomethane	5	< 50	< 5	< 5	< 5.0	< 2.0
Carbon Disulfide	60	< 50	< 5	< 5	< 5.0	< 2.0
Carbon Tetrachloride	5	< 50	< 5	< 5	< 5.0	< 1.0
Chlorobenzene	5	< 50	< 5	< 5	< 5.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 50	< 5	< 5	< 5.0	< 5.0
Chloroethane	5	< 50	< 5	< 5	< 5.0	< 1.0
Chloroform	7	**4.2 J**	**3.2 J**	**2.9 J**	**0.49 J**	< 1.0
Chloromethane	5	< 50	< 5	< 5	< 5.0	< 1.0
cis-1,2-Dichloroethene	5	**3900 D**	**61**	**180 D**	**7.9**	**3.9**
cis-1,3-Dichloropropene	0.4	< 50	< 5	< 5	< 5.0	< 1.0
Chlorodibromomethane	50	< 50	< 5	< 5	< 5.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 50	< 5	< 5	< 5.0	< 5.0
Ethylbenzene	5	< 50	< 5	< 5	< 5.0	< 1.0
Methyl-Tert-Butylether	5	<50	**0.75 J**	**0.22 J**	< 5.0	< 1.0
Methylene Chloride	5	< 50	< 5	< 5	< 5.0	< 2.0
Styrene (Monomer)	5	< 50	< 5	< 5	< 5.0	< 5.0
Tetrachloroethene	5	< 50	**0.24 J**	**0.24 J**	< 5.0	< 1.0
Toluene	5	< 50	< 5 J	< 5	< 5.0	< 1.0
trans-1,2-Dichloroethene	5	**6.7 J**	< 5	**0.59 J**	< 5.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 50	< 5	< 5	< 5.0	< 1.0
Trichloroethene	5	**72**	**20**	**20**	**13**	**6.3**
Trichlorotrifluoroethane (Freon 113)	5	< 50 U	< 5	< 5	< 5.0	< 5.0
Vinyl Chloride	2	**820**	< 2	**13**	< 2.0	< 1.0
o-Xylene	5	**7.2 J**	< 5	< 5	< 5.0	< 1.0
m,p-Xylene	5	< 50	< 5	< 5	< 5.0	< 1.0
Total VOCs (3)		**4800**	**86**	**220**	**21**	**10**
Project VOCs (4)		**4800**	**82**	**220**	**21**	**10**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-201-1 12/24/2015	MW-202-1 5/1/2009	MW-202-1 12/30/2015	MW-202-1 12/2/2009	MW-202-1 10/6/2010
	NYSDEC SCGs					
1,1,1-Trichloroethane	5		< 5	< 1.0	< 5	< 5
1,1,2,2-Tetrachloroethane	5	*< 1.0*	< 5	< 1.0	< 5	< 5
1,1,2-Trichloroethane	1	*< 1.0*	< 5	< 1.0	< 5	< 5
1,1-Dichloroethane	5	*< 1.0*	< 5	< 1.0	< 5	< 5
1,1-Dichloroethene	5	*< 1.0*	< 5	< 1.0	< 5	< 5
1,2-Dichloroethane	0.6	*< 1.0*	< 5	< 1.0	< 5	< 5
1,2-Dichloropropane	1	*< 1.0*	< 5	< 1.0	< 5	< 5
2-Butanone	NE	*< 10*	< 50	< 10	< 50	< 50
2-Hexanone	50	*< 5.0*	< 50	< 5.0	< 50	< 50
4-Methyl-2-Pentanone	50	*< 5.0*	< 50	< 5.0	< 50	< 50
Acetone	NE	*< 10*	< 50	< 10	< 50	< 50
Benzene	1	*< 1.0*	< 0.7	< 0.50	< 0.7	< 0.7
Bromodichloromethane	50	*< 1.0*	< 5	< 1.0	< 5	< 5
Bromoform	50	*< 4.0*	< 5	< 1.0	< 5	< 5
Bromomethane	5	*< 2.0*	< 5	< 2.0	< 5	< 5
Carbon Disulfide	60	*< 2.0*	< 5	< 2.0	< 5	< 5
Carbon Tetrachloride	5	*< 1.0*	< 5	< 1.0	< 5	< 5
Chlorobenzene	5	*< 1.0*	< 5	< 1.0	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	*< 5.0*	< 5	< 5.0	< 5	0.61 J
Chloroethane	5	*< 1.0*	< 5	< 1.0	< 5	< 5
Chloroform	7	***0.43***	**6.2**	**0.43 J**	**6.7**	0.93 J
Chloromethane	5	*< 1.0*	< 5	< 1.0	< 5	< 5
cis-1,2-Dichloroethene	5	***2***	**0.64 J**	**2.0**	**0.58 J**	< 5
cis-1,3-Dichloropropene	0.4	*< 1.0*	< 5	< 1.0	< 5	< 5
Chlorodibromomethane	50	*< 1.0*	< 5	< 1.0	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	*< 5.0*	< 5	< 2.0	< 5	< 5
Ethylbenzene	5	*< 1.0*	< 5	< 1.0	< 5	< 5
Methyl-Tert-Butylether	5	*< 1.0*	--	< 1.0	--	< 5
Methylene Chloride	5	*< 2.0*	< 5	< 2.0	< 5	< 5
Styrene (Monomer)	5	*< 5.0*	< 5	< 1.0	< 5	< 5
Tetrachloroethene	5	*< 1.0*	< 5	< 1.0	< 5	0.48 J
Toluene	5	*< 1.0*	< 5	< 1.0	< 5	< 5
trans-1,2-Dichloroethene	5	*< 1.0*	< 5	< 1.0	< 5	< 5
trans-1,3-Dichloropropene	0.4	*< 1.0*	< 5	< 1.0	< 5	< 5
Trichloroethene	5	***2.3***	**7.5**	**2.3**	**9.3**	2.4 J
Trichlorotrifluoroethane (Freon 113)	5	*< 5.0*	< 5	< 5.0	< 5	0.43 J
Vinyl Chloride	2	*< 1.0*	< 2	< 1.0	< 2	< 2
o-Xylene	5	*< 1.0*	< 5	< 1.0	< 5	< 5
m,p-Xylene	5	*< 1.0*	< 5	< 1.0	< 5	< 5
Total VOCs (3)		***4.7***	**14**	**4.7**	**17**	**5**
Project VOCs (4)		***4.6***	**8.1**	**4.3**	**9.9**	**2.88**
1,4-Dioxane		***0.262***	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-202-1 11/3/2011	MW-202-1 10/4/2012	MW-202-1 5/30/2013	MW-202-1 11/19/2014	MW-202-1 (REP) 11/19/2014
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	**0.32 J**	**0.74 J**	**0.93 J**	**0.70 J**	**0.69 J**
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 5	< 5	< 5.0	< 1.0	< 1.0
1,1-Dichloroethane	5	**0.86 J**	**2.1 J**	**3.0 J**	**2.4**	**2.2**
1,1-Dichloroethene	5	**0.72 J**	**1.9 J**	**2.3 J**	**1.7**	**1.8**
1,2-Dichloroethane	0.6	< 5	< 5	< 5.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 5	< 5	< 5.0	< 1.0	< 1.0
2-Butanone	NE	< 50	< 50	< 50	< 10	< 10
2-Hexanone	50	< 50	< 50	< 50	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 5.0	< 5.0
Acetone	NE	< 50	< 50	< 50	< 10	< 10
Benzene	1	< 0.7	< 0.7	< 0.70	< 1.0	< 1.0
Bromodichloromethane	50	< 5	< 5	< 5.0	< 1.0	< 1.0
Bromoform	50	< 5	< 5	< 5.0	< 4.0	< 4.0
Bromomethane	5	< 5	< 5	< 5.0	< 2.0	< 2.0
Carbon Disulfide	60	< 5	< 5	< 5.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorobenzene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	**0.21 J**	< 5	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Chloroform	7	< 5	< 5	< 5.0	< 1.0	< 1.0
Chloromethane	5	< 5	< 5	< 5.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	< 5	**0.4 J**	**0.63 J**	**1.1**	**1.0**
cis-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 5	< 5	< 5.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Ethylbenzene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	**0.37 J**	< 5	< 5.0	< 1.0	< 1.0
Methylene Chloride	5	< 5	< 5	< 5.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 5	< 5	< 5.0	< 5.0	< 5.0
Tetrachloroethene	5	**0.92 J**	**1.7 J**	**2.8 J**	**2.3**	**2.4**
Toluene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 5	< 5	< 5.0	< 1.0	< 1.0
Trichloroethene	5	**0.78 J**	**1.2 J**	**1.6 J**	**2.1**	**2.0**
Trichlorotrifluoroethane (Freon 113)	5	**0.44 J**	**0.76 J**	**1.4 J**	**1.8 J**	**1.8 J**
Vinyl Chloride	2	< 2	< 2	< 2.0	< 1.0	< 1.0
o-Xylene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
m,p-Xylene	5	< 5	< 5	< 5.0	< 1.0	< 1.0
Total VOCs (3)		**5**	**8.8**	**13**	**12**	**12**
Project VOCs (4)		**3.6**	**8.0**	**11**	**10**	**10**
1,4-Dioxane		**--**	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-202-1 12/31/2015	MW-203-1 5/1/2009	MW-203-1 12/2/2009	MW-203-1 10/5/2010	MW-203-1 11/1/2011
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	*< 1.0*	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	*< 1.0*	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	*< 1.0*	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	***2.4***	< 5	< 5	< 5	**0.32 J**
1,1-Dichloroethene	5	***1.5***	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	*< 1.0*	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	*< 1.0*	< 5	< 5	< 5	< 5
2-Butanone	NE	*< 10*	< 50	< 50	< 50	< 50
2-Hexanone	50	*< 5.0*	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone	50	*< 5.0*	< 50	< 50	< 50	< 50
Acetone	NE	*< 10*	< 50 B	< 50	< 50 B	< 50
Benzene	1	*< 0.50*	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	*< 1.0*	< 5	< 5	< 5	< 5
Bromoform	50	*< 1.0*	< 5	< 5	< 5	< 5
Bromomethane	5	*< 2.0*	< 5	< 5	< 5	< 5
Carbon Disulfide	60	*< 2.0*	< 5	< 5	< 5	< 5
Carbon Tetrachloride	5	*< 1.0*	< 5	< 5	< 5	< 5
Chlorobenzene	5	*< 1.0*	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	*< 5.0*	**73**	**17**	**29**	**8.9**
Chloroethane	5	*< 1.0*	< 5	< 5	< 5	< 5
Chloroform	7	*< 1.0*	**7.9**	**2.6 J**	**1.5 J**	**0.68 J**
Chloromethane	5	*< 1.0*	< 5	< 5	< 5	< 5
cis-1,2-Dichloroethene	5	***1.2***	**1.6 J**	**0.83 J**	**0.97 J**	**1.4 J**
cis-1,3-Dichloropropene	0.4	*< 1.0*	< 5	< 5	< 5	< 5
Chlorodibromomethane	50	*< 1.0*	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	*< 2.0*	< 5	< 5	< 5	< 5
Ethylbenzene	5	*< 1.0*	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether	5	*< 1.0*	--	--	**0.88 J**	**0.41 J**
Methylene Chloride	5	*< 2.0*	< 5	< 5	< 5	< 5
Styrene (Monomer)	5	*< 1.0*	< 5	< 5	< 5	< 5
Tetrachloroethene	5	***2.5***	< 5	< 5	< 5	**0.35 J**
Toluene	5	*< 1.0*	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene	5	*< 1.0*	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene	0.4	*< 1.0*	< 5	< 5	< 5	< 5
Trichloroethene	5	***1.3***	**1.3 J**	**0.7 J**	**1.6 J**	**2.9 J**
Trichlorotrifluoroethane (Freon 113)	5	***1.1 J***	< 5	< 5	< 5	< 5
Vinyl Chloride	2	*< 1.0*	< 2	< 2	< 2	< 2
o-Xylene	5	*< 1.0*	< 5	< 5	< 5	< 5
m,p-Xylene	5	*< 1.0*	< 5	< 5	< 5	< 5
Total VOCs (3)		***10***	**84**	**21**	**34**	**15**
Project VOCs (4)		***8.9***	**2.9**	**1.5**	**2.6**	**5**
1,4-Dioxane		***0.404***	**--**	**--**	**--**	**--**

Table 12
Concentrations of Volatile Organic Compounds and 1
in Groundwater Samples Collected from Monitoring V
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-203-1 10/3/2012	MW-203-1 (REP) 5/31/2013	MW-203-1 5/31/2013	MW-203-1 11/19/2014	MW-203-1 12/30/2015
	NYSDEC SCGs					
1,1,1-Trichloroethane	5	**0.26 J**	< 5.0	**0.25 J**	< 1.0	*< 1.0*
1,1,2,2-Tetrachloroethane	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
1,1,2-Trichloroethane	1	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
1,1-Dichloroethane	5	**1 J**	**0.98 J**	**1.1 J**	**0.60 J**	***0.38 J***
1,1-Dichloroethene	5	**0.44 J**	**0.47 J**	**0.46 J**	< 1.0	*< 1.0*
1,2-Dichloroethane	0.6	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
1,2-Dichloropropane	1	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
2-Butanone	NE	< 50	< 50	< 50	< 10	*< 10*
2-Hexanone	50	< 50	< 50	< 50	< 5.0	*< 5.0*
4-Methyl-2-Pentanone	50	< 50	< 50	< 50	< 5.0	*< 5.0*
Acetone	NE	< 50	< 50	< 50	< 10	*< 10*
Benzene	1	< 0.7	< 0.70	< 0.70	< 1.0	*< 0.50*
Bromodichloromethane	50	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Bromoform	50	< 5	< 5.0	< 5.0	< 4.0	*< 1.0*
Bromomethane	5	< 5	< 5.0	< 5.0	< 2.0	*< 2.0*
Carbon Disulfide	60	< 5	< 5.0	< 5.0	< 2.0	*< 2.0*
Carbon Tetrachloride	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Chlorobenzene	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Chlorodifluoromethane (Freon 22)	NE	**3.6 J**	**3.5 J**	**3.2 J**	< 5.0	***1.9 J***
Chloroethane	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Chloroform	7	**0.36 J**	**0.28 J**	**0.27 J**	**0.34 J**	***0.32 J***
Chloromethane	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
cis-1,2-Dichloroethene	5	**0.62 J**	**0.39 J**	**0.24 J**	**0.39 J**	***0.35 J***
cis-1,3-Dichloropropene	0.4	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Chlorodibromomethane	50	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5.0	< 5.0	< 5.0	*< 2.0*
Ethylbenzene	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Methyl-Tert-Butylether	5	**0.21 J**	**0.24 J**	**0.24 J**	**1.1**	***0.58 J***
Methylene Chloride	5	< 5	< 5.0	< 5.0	< 2.0	*< 2.0*
Styrene (Monomer)	5	< 5	< 5.0	< 5.0	< 5.0	*< 1.0*
Tetrachloroethene	5	**0.59 J**	**0.93 J**	**1.1 J**	**1.1**	***1.2***
Toluene	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
trans-1,2-Dichloroethene	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
trans-1,3-Dichloropropene	0.4	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Trichloroethene	5	**1.8 J**	**2.5 J**	**2.7 J**	**3.2**	***2.5***
Trichlorotrifluoroethane (Freon 113)	5	**1.1 J**	**1.1 J**	**1.4 J**	< 5.0	***0.56 J***
Vinyl Chloride	2	< 2	< 2.0	< 2.0	< 1.0	*< 1.0*
o-Xylene	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
m,p-Xylene	5	< 5	< 5.0	< 5.0	< 1.0	*< 1.0*
Total VOCs (3)		**10**	**10**	**11**	**6.7**	***7.8***
Project VOCs (4)		**4.7**	**5.3**	**5.9**	**5.2**	***4.4***
1,4-Dioxane		**--**	**--**	**--**	**--**	***0.134***

Table 12
Concentrations of Volatile Organic Compounds and 1
**in Groundwater Samples Collected from Monitoring **
Bethpage Park Groundwater Containment System,
OU 3 (Former Settling Ponds)
Bethpage, New York

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-204-1 12/24/2015	MW-205-1 12/29/2015	MW-206-1 12/29/2015	MW-208-1 12/29/2015
	NYSDEC SCGs				
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	**0.44 J**	**2.9**
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	**0.89 J**
1,2-Dichloroethane	0.6	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	NE	< 10	< 10	< 10	< 10
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	50	< 5.0	**3.0 J**	< 5.0	< 5.0
Acetone	NE	< 10	< 10	< 10	< 10
Benzene	1	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane	50	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	50	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide	60	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodifluoromethane (Freon 22)	NE	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	**0.50 J**	< 1.0	< 1.0	**3.1**
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	**2.5**	**1.1**	**0.32 J**	**546 D**
cis-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	50	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon 12)	5	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0
Methyl-Tert-Butylether	5	< 1.0	< 1.0	< 1.0	**0.39 J**
Methylene Chloride	5	< 2.0	< 2.0	< 2.0	< 2.0
Styrene (Monomer)	5	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	**0.45 J**	< 1.0
Toluene	5	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5	**4.0**	**0.76 J**	< 1.0	**17.4**
Trichlorotrifluoroethane (Freon 113)	5	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	2	< 1.0	< 1.0	< 1.0	**6.4**
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0
Total VOCs (3)		**7**	**4.9**	**1.2**	**580**
Project VOCs (4)		**6.5**	**1.9**	**1.2**	**570**
1,4-Dioxane		**< 0.11**	**0.162**	**< 0.10**	**0.526**

Table 12
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds) Bethpage, New York

Notes and Abbreviations:

(1) Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).

(2) Samples analyzed for the TCL VOCs using NYSDEC ASP 2005 Method OLM4.3 (prior to November 2014) and per USEPA Method 9260C (after November 2014). Samples analyzed for 1,4-Dioxane using USEPA Method 8270 SIM.

(3) "Total VOCs" represents the sum of individual concentrations of the VOCs detected. TVOCs were rounded to two significant figures.

(4) "Project VOCs" represents the sum of individual compound concentrations of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2-Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethene; Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene; and Xylenes-o,m, and p.

italicized indicates most recent data

Indicates an exceedance of an SCG.

Bold value indicates a detection.

NYSDEC	New York State Department of Environmental Conservation.
TCL	Target compound list.
VOC	Volatile Organic Compound.
ASP	Analytical services protocol.
SCGs	Standards, criteria, and guidance values.
µg/L	Micrograms per liter.
USEPA	United State Environmental Protection Agency.
SIM	Selective Ion Monitoring
NE	Not established.
E	Concentration for the constituent exceeded the calibration range.
J	Value is estimated.
D	Constituent identified from secondary dilution.
R	Concentration for the constituent was rejected.
B	Compound detected in associated blank sample.
< 5	Compound not detected above its laboratory quantification limit.
REP	Field replicate QA/QC sample
--	Not analyzed

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	B24MW-2 4/23/2009	B24MW-3 4/20/2009	BCPMW-1 4/28/2009	BCPMW-2 4/28/2009	BCPMW-3 4/29/2009	BCPMW-4-1 4/17/2009	BCPMW-4-1 10/4/2010	BCPMW-4-1 10/28/2011
	NYSDEC SCGs								
Cadmium, Total	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Cadmium, Dissolved	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chromium, Total	50	**40.3**	**28.2**	**20.8**	< 10	< 10	**22.7**	**43**	**25**
Chromium, Dissolved	50	< 10	10.6	< 10	< 10	< 10	**12.8**	**41**	**22**
Iron (total)	300	--	**597**	--	< 100	**2080**	**103**	--	--
Iron (dissolved)	300	--	< 100	--	< 100	**1760**	< 100	--	--
Manganese (total)	300	--	**16.9**	--	**12.7**	**51.4**	**11.2**	--	--
Manganese (dissolved)	300	--	**13.7**	--	**11.3**	**49.2**	< 10	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-1 10/3/2012	BCPMW-4-1 10/4/2012	BCPMW-4-1 6/5/2013	BCPMW-4-1 11/17/2014	BCPMW-4-1 10/8/2015	BCPMW-4-1 12/30/2015	BCPMW-4-2 4/17/2009	BCPMW-4-2 10/7/2010
	NYSDEC SCGs								
Cadmium, Total	5	< 5	--	< 5.0	< 3.0	< 3.0	< *3.0*	< 5	< 5
Cadmium, Dissolved	5	--	< 5	< 5.0	< 3.0	< 3.0	< *3.0*	< 5	--
Chromium, Total	50	**32**	--	**16.1**	**24.7**	**24.9**	***22.7***	**10.6**	< 10
Chromium, Dissolved	50	--	**26**	**13.1**	**20.7**	**22.1**	***19.2***	< 10	--
Iron (total)	300	--	--	--	--	--	--	**4630**	--
Iron (dissolved)	300	--	--	--	--	--	--	**4080**	--
Manganese (total)	300	--	--	--	--	--	--	**228**	--
Manganese (dissolved)	300	--	--	--	--	--	--	**217**	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-2 10/28/2011	BCPMW-4-2 10/3/2012	BCPMW-4-2 10/4/2012	BCPMW-4-2 6/5/2013	BCPMW-4-2 11/18/2014	BCPMW-4-2 10/8/2015	BCPMW-4-2 12/31/2015	BCPMW-4-3 4/17/2009
	NYSDEC SCGs								
Cadmium, Total	5	< 5	< 5	--	< 5.0	< 3.0	< 3.0	< *3.0*	< 5
Cadmium, Dissolved	5	< 5	--	< 5	< 5.0	< 3.0	< 3.0	< *3.0*	< 5
Chromium, Total	50	< 10	< 10	--	< 10	**4.1 B**	< 10	< *10*	< 10
Chromium, Dissolved	50	< 10	--	< 10	< 10	< 10	< 10	< *10*	< 10
Iron (total)	300	--	--	--	--	--	--	--	< 100
Iron (dissolved)	300	--	--	--	--	--	--	--	< 100
Manganese (total)	300	--	--	--	--	--	--	--	< 10
Manganese (dissolved)	300	--	--	--	--	--	--	--	< 10

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-3 10/7/2010	BCPMW-4-3 10/28/2011	BCPMW-4-3 10/3/2012	BCPMW-4-3 10/4/2012	BCPMW-4-3 (REP) 6/5/2013	BCPMW-4-3 6/5/2013	BCPMW-4-3 11/17/2014
	NYSDEC SCGs							
Cadmium, Total	5	< 5	< 5	*< 5*	--	< 5.0	< 5.0	< 3.0
Cadmium, Dissolved	5	< 5	< 5	--	< 5	< 5.0	< 5.0	< 3.0
Chromium, Total	50	< 10	< 10	*< 10*	--	< 10	< 10	**6.8 B**
Chromium, Dissolved	50	< 10	< 10	--	< 10	< 10	< 10	**3.7 B**
Iron (total)	300	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-4-3 10/9/2015	BCPMW-4-3 12/31/2015	BCPMW-5-1 4/23/2009	BCPMW-6-1 4/20/2009	BCPMW-6-1 10/6/2010	BCPMW-6-1 10/31/2011	BCPMW-6-1 10/3/2012	BCPMW-6-1 10/4/2012
	NYSDEC SCGs								
Cadmium, Total	5	< 3.0	*< 3.0*	< 5	< 5	<5	< 5	< 5	--
Cadmium, Dissolved	5	< 3.0	*< 3.0*	< 5	< 5	<5	< 5	--	< 5
Chromium, Total	50	< 10	*< 10*	< 10	< 10	< 10	**14**	< 10	--
Chromium, Dissolved	50	< 10	*< 10*	< 10	< 10	<10	< 10	--	< 10
Iron (total)	300	--	--	**7420**	< 100	--	--	--	--
Iron (dissolved)	300	--	--	**6370**	< 100	--	--	--	--
Manganese (total)	300	--	--	**145**	< 10	--	--	--	--
Manganese (dissolved)	300	--	--	**131**	< 10	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-1 6/7/2013	BCPMW-6-1 11/11/2014	BCPMW-6-1 12/23/2015	BCPMW-6-2 5/8/2009	BCPMW-6-2 10/6/2010	BCPMW-6-2 10/31/2011	BCPMW-6-2 10/3/2012	BCPMW-6-2 10/4/2012
	NYSDEC SCGs								
Cadmium, Total	5	< 5.0	< 3.0	< *3.0*	< 5	<5	<5	< 5	--
Cadmium, Dissolved	5	< 5.0	< 3.0	< *3.0*	< 5	<5	<5	--	< 5
Chromium, Total	50	< 10	**11.6**	< *10*	**10.3**	<10	<10	< 10	--
Chromium, Dissolved	50	< 10	< 10 B	< *10*	< 10	<10	<10	--	< 10
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-6-2 6/5/2013	BCPMW-6-2 11/11/2014	BCPMW-6-2 12/23/2015	BCPMW-7-1 4/20/2009	BCPMW-7-1 10/7/2010	BCPMW-7-1 11/1/2011	BCPMW-7-1 10/4/2012	BCPMW-7-1 6/7/2013
	NYSDEC SCGs								
Cadmium, Total	5	< 5.0	< 3.0	< *3.0*	< 5	< 5	< 5	< 5	< 5.0
Cadmium, Dissolved	5	< 5.0	< 3.0	< *3.0*	< 5	< 5	< 5	< 5	< 5.0
Chromium, Total	50	< 10	**13.9**	< *10*	< 10	< 10	< 10	< 10	< 10
Chromium, Dissolved	50	< 10	< 10 B	< *10*	< 10	< 10	< 10	< 10	< 10
Iron (total)	300	--	--	--	< 100	--	--	--	--
Iron (dissolved)	300	--	--	--	< 100	--	--	--	--
Manganese (total)	300	--	--	--	**106**	--	--	--	--
Manganese (dissolved)	300	--	--	--	**94.8**	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	BCPMW-7-1 11/18/2014	BCPMW-7-1 12/22/2015	MW-200-1 4/29/2009	MW-200-1 10/5/2010	MW-200-1 11/3/2011	MW-200-1(3) 10/4/2012	MW-200-1 4/15/2013	MW-200-1 5/31/2013
	NYSDEC SCGs								
Cadmium, Total	5	< 3.0	< *3.0*	< 5	< 5	< 5	< 5	--	< 5
Cadmium, Dissolved	5	< 3.0	< *3.0*	< 5	< 5	< 5	< 5	--	< 5
Chromium, Total	50	**5.1 B**	< *10*	< 10	**14**	**48**	**1130**	**86**	**15.7**
Chromium, Dissolved	50	**0.90 B**	< *10*	< 10	< 10	**13**	**320**	**21**	< 10
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-200-1 11/18/2014	MW-200-1 12/24/2015	MW-201-1 5/1/2009	MW-201-1 10/5/2010	MW-201-1 11/3/2011	MW-201-1(3) 10/4/2012	MW-201-1 4/16/2013	MW-201-1 5/31/2013
	NYSDEC SCGs								
Cadmium, Total	5	< 3.0	*< 3.0*	< 5	< 5	< 5	< 5	--	< 5
Cadmium, Dissolved	5	< 3.0	*< 3.0*	< 5	< 5	< 5	< 5	--	< 5
Chromium, Total	50	**96.7**	***54.2***	< 10	< 10	< 10	**159**	**28**	< 10
Chromium, Dissolved	50	**19**	***29.5***	< 10	< 10	< 10	**42**	**17**	< 10
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-201-1 11/20/2014	MW-201-1 12/30/2015	MW-202-1 5/1/2009	MW-202-1 10/6/2010	MW-202-1 11/3/2011	MW-202-1(3) 10/4/2012	MW-202-1 4/16/2013	MW-202-1 5/30/2013
	NYSDEC SCGs								
Cadmium, Total	5	< 3.0	*< 3.0*	< 5	< 5	< 5	< 5	--	< 5
Cadmium, Dissolved	5	< 3.0	*< 3.0*	< 5	< 5	< 5	< 5	--	< 5
Chromium, Total	50	**6.7 B**	*< 10*	**16.5**	**15**	**23**	**263 J**	**19**	**34.3**
Chromium, Dissolved	50	**1.7 B**	*< 10*	< 10	<10	< 10	22	<10	< 10
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-202-1(REP) 11/19/2014	MW-202-1 11/19/2014	MW-202-1 12/31/2015	MW-203-1 5/1/2009	MW-203-1 10/5/2010	MW-203-1 11/1/2011	MW-203-1(3) 10/3/2012
	NYSDEC SCGs							
Cadmium, Total	5	< 3.0	< 3.0	*< 3.0*	< 5	< 5	< 5	< 5
Cadmium, Dissolved	5	< 3.0	< 3.0	*< 3.0*	< 5	< 5	< 5	--
Chromium, Total	50	**83.8**	**74.3**	***34.9***	**31.5**	**31**	**37**	**1600**
Chromium, Dissolved	50	**2.3 B**	**2.7 B**	*< 10*	< 10	< 10	< 10	--
Iron (total)	300	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Constituents (units in ug/L)	Sample Location: Sample Date:	MW-203-1 10/4/2012	MW-203-1 4/16/2013	MW-203-1(REP) 5/31/2013	MW-203-1 5/31/2013	MW-203-1 11/19/2014	MW-203-1 12/20/2015
	NYSDEC SCGs						
Cadmium, Total	5	--	--	< 5	< 5	< 3.0	*< 3.0*
Cadmium, Dissolved	5	< 5	--	< 5	< 5	< 3.0	*< 3.0*
Chromium, Total	50	--	**155**	**38.2**	**29.5**	**22.9**	***81.6***
Chromium, Dissolved	50	**84**	<10	< 10	< 10	**3.3 B**	*< 10*
Iron (total)	300	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--

See notes on last page.

Table 13
Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, OU 3 (Former Settling Ponds), Bethpage, New York [1,2]

Notes:

(1) Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).
(2) Samples analyzed for the metals using EPA Method 6010.
(3) Samples collected with HydraSleeve™ no purge method, all other samples collected by purge (3-Volume) method.

italicized indicates most recent data

	Indicates an exceedance of an SCG.
Bold	Indicates a detection.
RI/FS	Remedial Investigation/Feasibility Study.
NYSDEC	New York State Department of Environmental Conservation.
EPA	Environmental Protection Agency
SCGs	Standards, criteria, and guidance values.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5	Compound not detected above its laboratory quantification limit.

FIGURES

SOURCE:
USGS 7.5 MIN. AMITYVILLE QUADRANGLE, AMITYVILLE, N.Y., 1994, FREEPORT QUADRANGLE, FREEPORT, N.Y., 1994,
HICKSVILLE QUADRANGLE, HICKSVILLE, N.Y., 1967, PHOTOREVISED 1979, HUNTINGTON, N.Y., 1967, PHOTOREVISED 1979

0 2000' 4000'
SCALE IN FEET

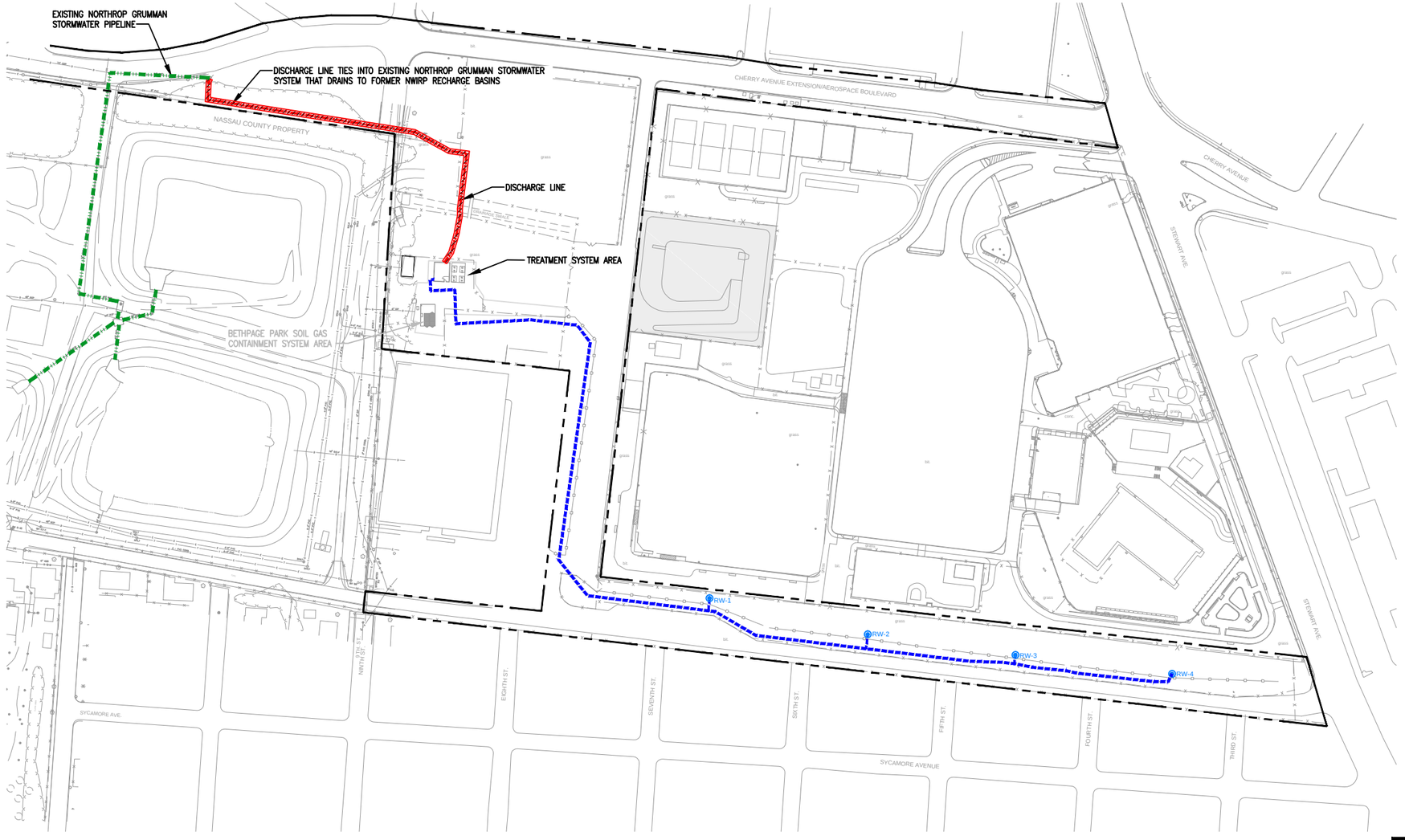
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE LOCATION

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD: PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF* PLOTTED: 11/11/2015 4:54 PM BY: STOWELL, GARY
G:\ENVCAD\SYRACUSE\ACT\NY001496\1114\DWG\NY1496_B01.dwg LAYOUT: BETHPAGE PARK SAVED: 11/11/2015 4:51 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ----
XREFS: IMAGES: AMITYVILLE.TIF FREEPORT.TIF HICKSVILLE.TIF HUNTINGTON.TIF PROJECTNAME: ----



LEGEND:

- NORTHROP GRUMMAN PROPERTY LINE
- FENCE
- bit. BITUMINOUS PAVEMENT
- INFLUENT PIPELINE AND ELECTRICAL CONDUITS
- EFFLUENT PIPELINE
- EXISTING NORTHROP GRUMMAN STORMWATER PIPELINE
- RW-4 REMEDIAL WELL
- NWIRP NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NOW OWNED BY NASSAU COUNTY)

0 200' 400'

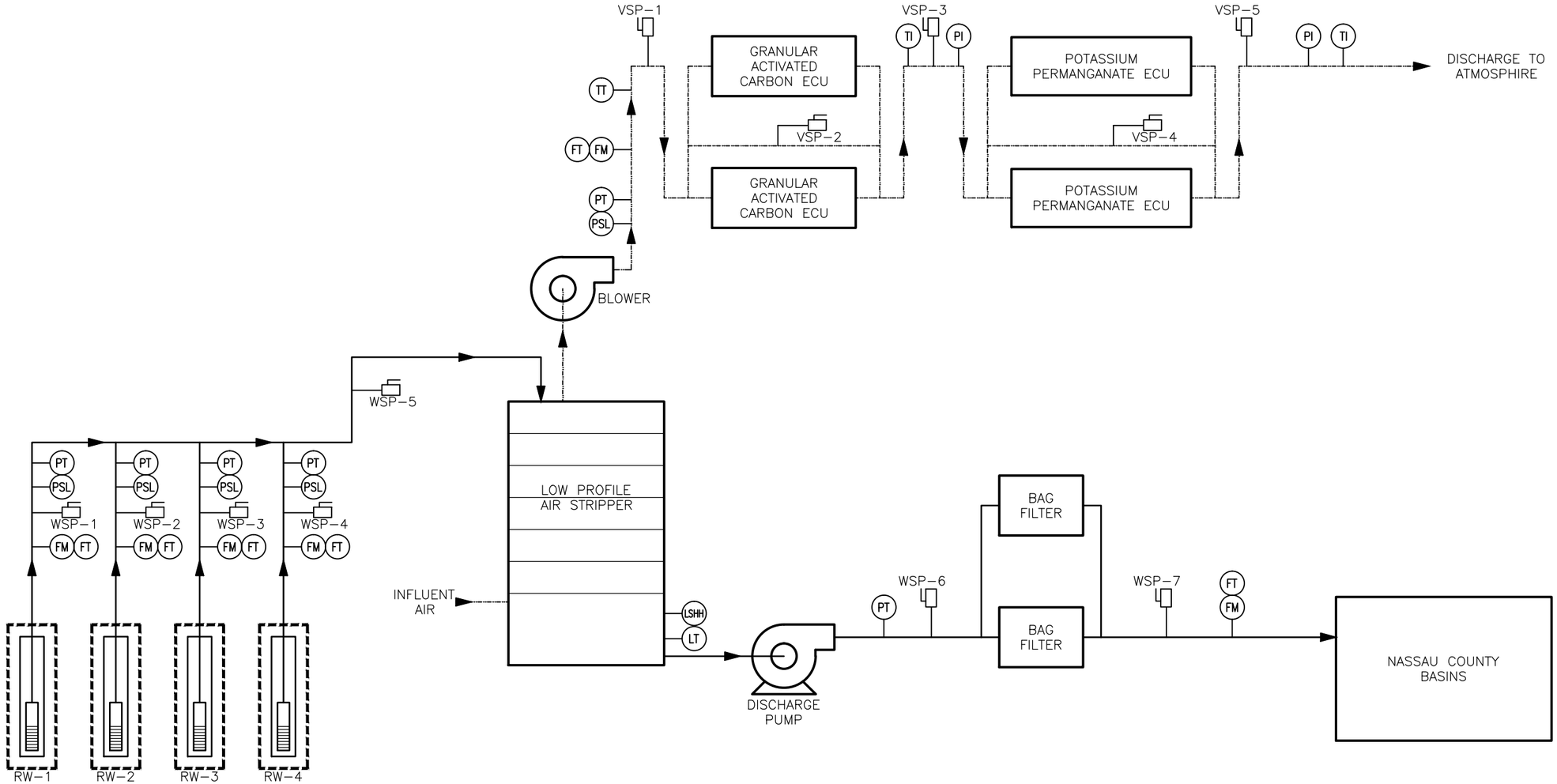
SCALE IN FEET

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE AND GROUNDWATER CONTAINMENT SYSTEM

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2



LEGEND:

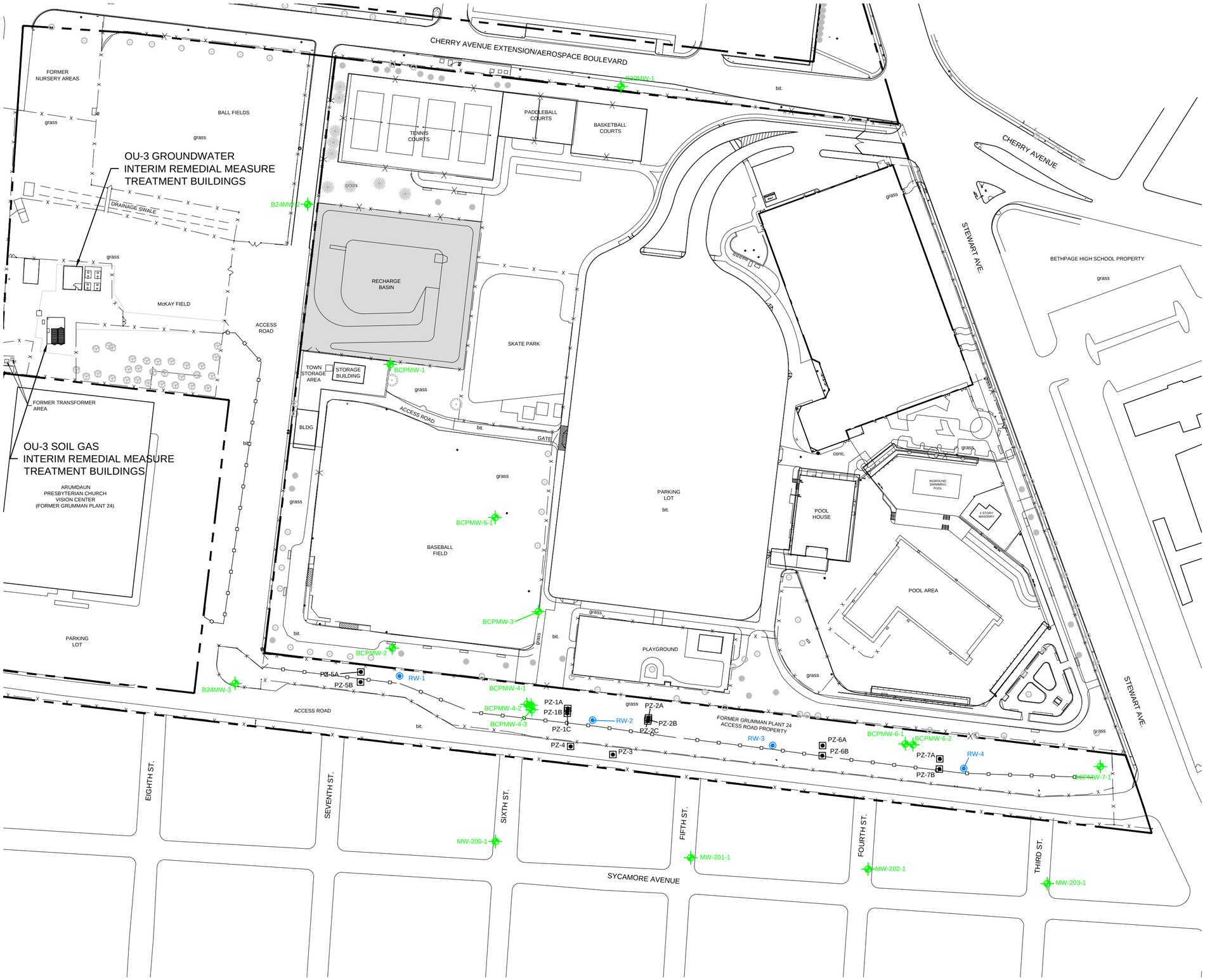
———	PROCESS WATER
- - - - -	PROCESS AIR
FM	INSTRUMENT
	SAMPLE PORT
	FLOW DIRECTION
FM	FLOW METER
FT	FLOW RATE TRANSMITTER
PSL	PRESSURE VACUUM LOW
PT	PRESSURE TRANSMITTER
PI	PRESSURE INDICATOR
LSHH	LEVEL SWITCH HIGH HIGH
LT	LEVEL TRANSMITTER
TT	TEMPERATURE TRANSMITTER
TI	TEMPERATURE INDICATOR
WSP	WATER SAMPLE PORT
VSP	VAPOR SAMPLE PORT
ECU	EMISSION CONTROL UNIT

BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

GROUNDWATER TREATMENT SYSTEM PROCESS SCHEMATIC AND MONITORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3



EXPLANATION:

- NORTHROP GRUMMAN PROPERTY LINE
- FENCE
- BASIN
- bit. BITUMINOUS PAVEMENT
- MW-200-1 MONITORING WELL
- RW-2 REMEDIAL WELL
- PZ-2C PIEZOMETER

NOTES:

1. MONITORING WELLS, REMEDIAL WELLS, AND PIEZOMETERS SURVEYED TO NORTH AMERICAN DATUM (NAD) 83.
2. PARK FEATURES SHOWN WERE PRESENT PRIOR TO TOWN OF OYSTER BAY REDEVELOPMENT IN 2005.

0 100' 200'
SCALE IN FEET

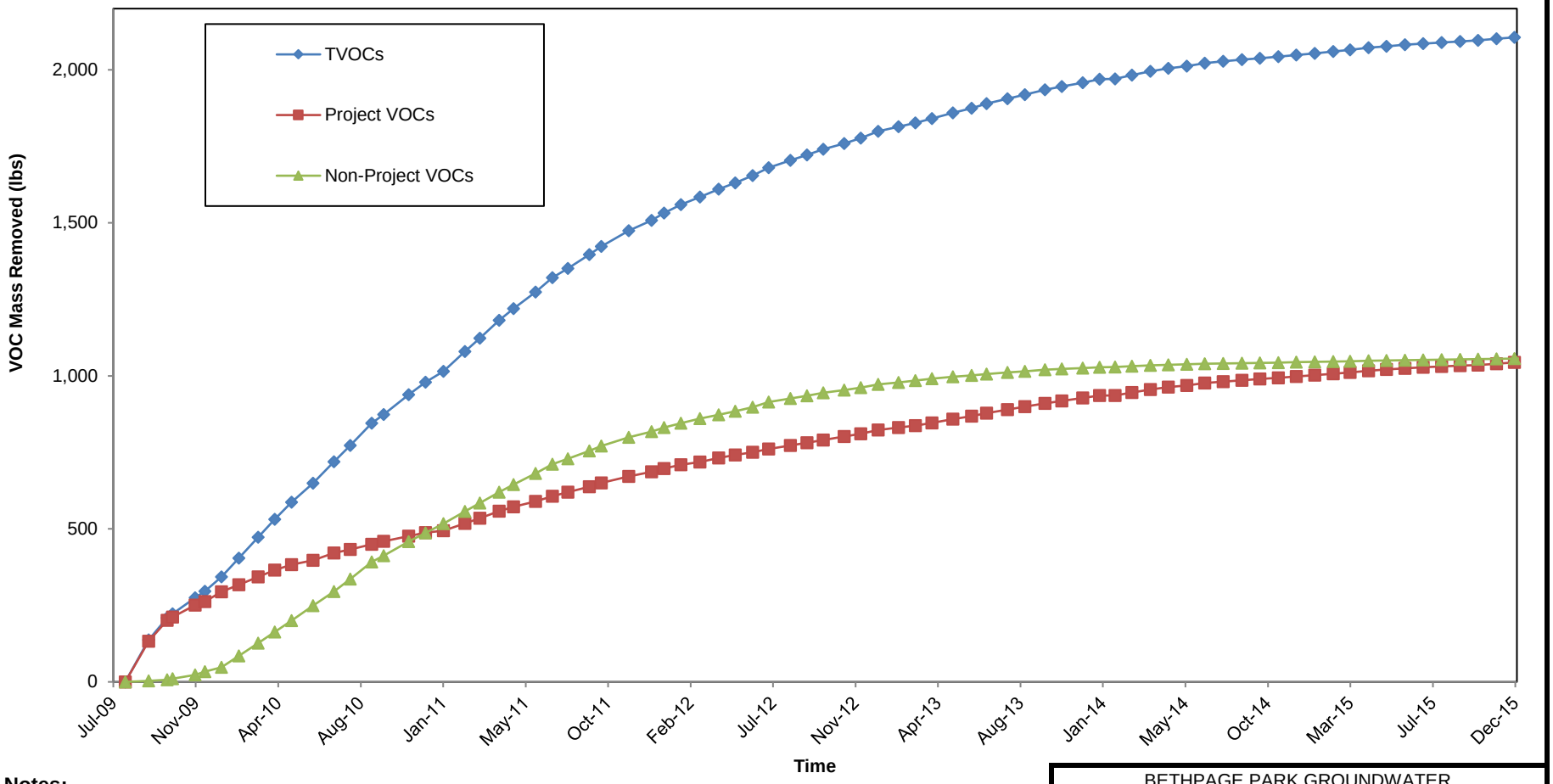
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

GROUNDWATER MONITORING NETWORK SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY:(Req'd) DIV/GROUP:(Req'd) DB:(Req'd) LD:(Opt) PIC:(Opt) PM:(Req'd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\S*RAC\JSE\ACTNY001498\114\OM\M41498W02.dwg LAYOUT: 4 SAVED: 11/11/2015 4:33 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 11/11/2015 4:54 PM BY: STOWELL, GARY
XREFS: IMAGES: PROJECTNAME: ---
X1498X01



Notes:

VOC = Volatile organic compound.

lbs = Pounds.

TVOCs = Sum of VOCs detected.

Project VOCs = Sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes.

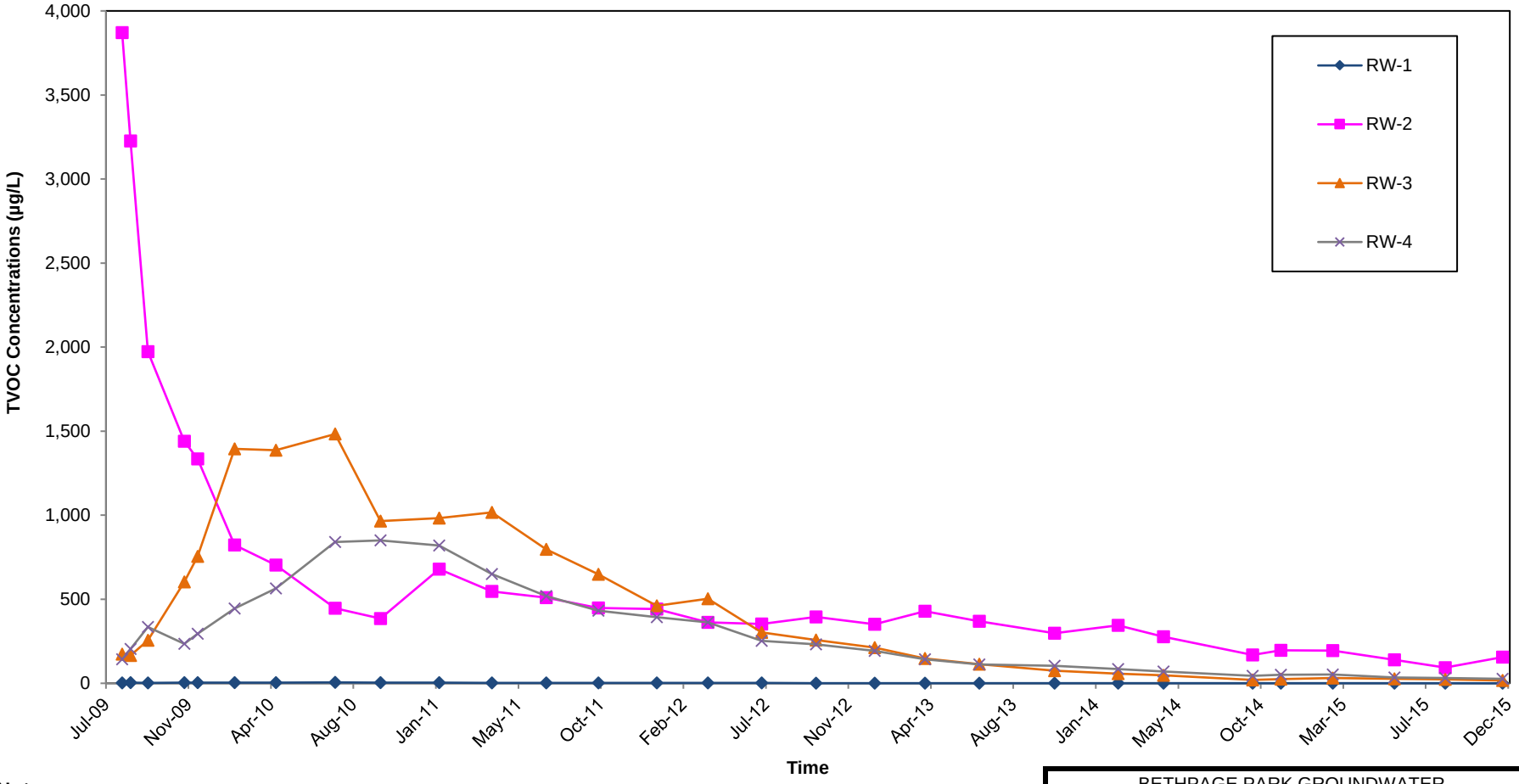
Non-Project VOCs = Sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

CUMULATIVE TOTAL, PROJECT, AND NON-PROJECT VOC MASS REMOVED THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5



Notes:

VOC = Volatile organic compound.

µg/L = Micrograms per liter.

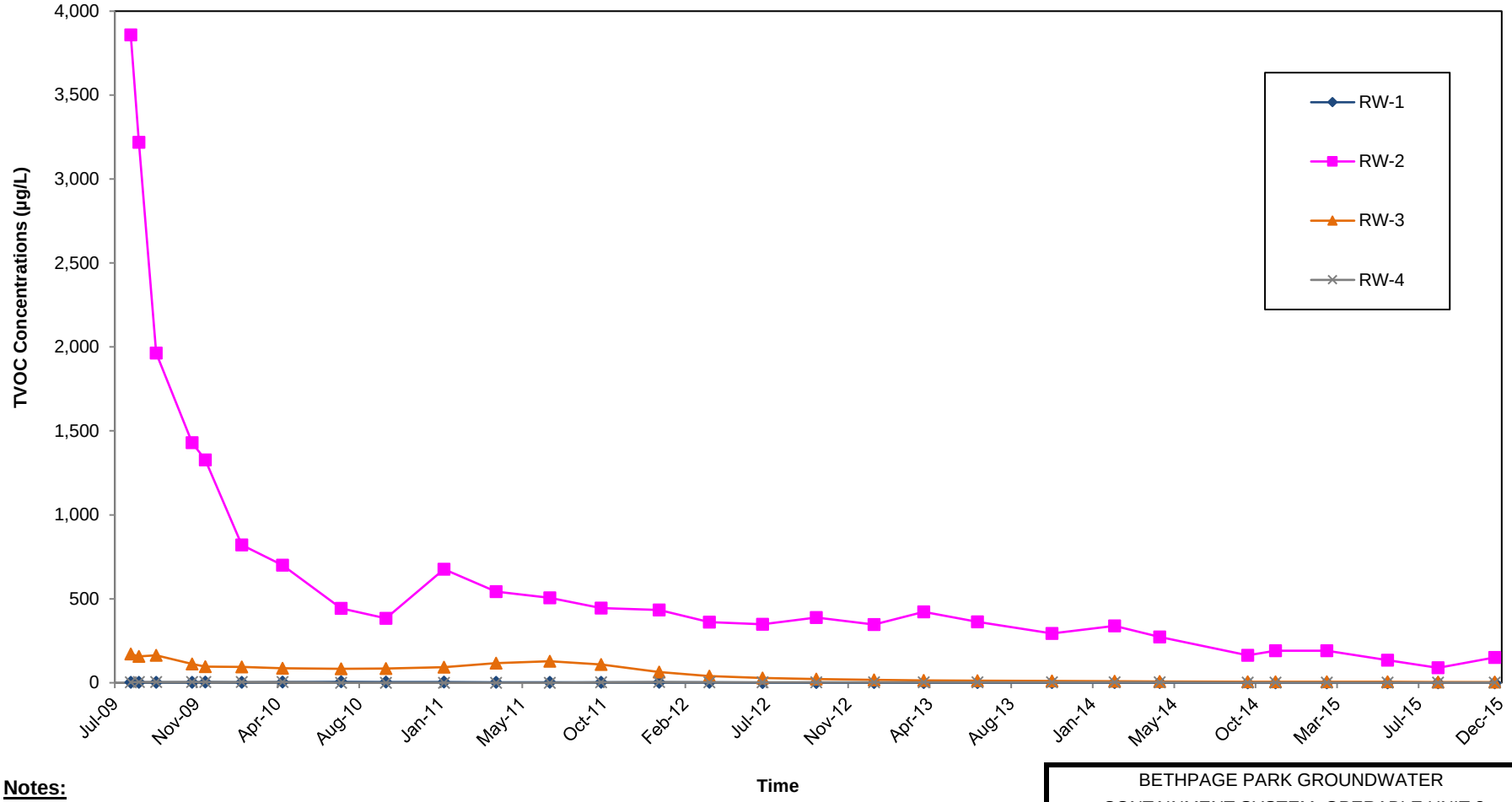
TVOCs = Sum of VOCs detected.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL TVOC CONCENTRATIONS THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6A



Notes:

VOC = Volatile organic compound.

µg/L = Micrograms per liter.

TVOCs = Sum of VOCs detected.

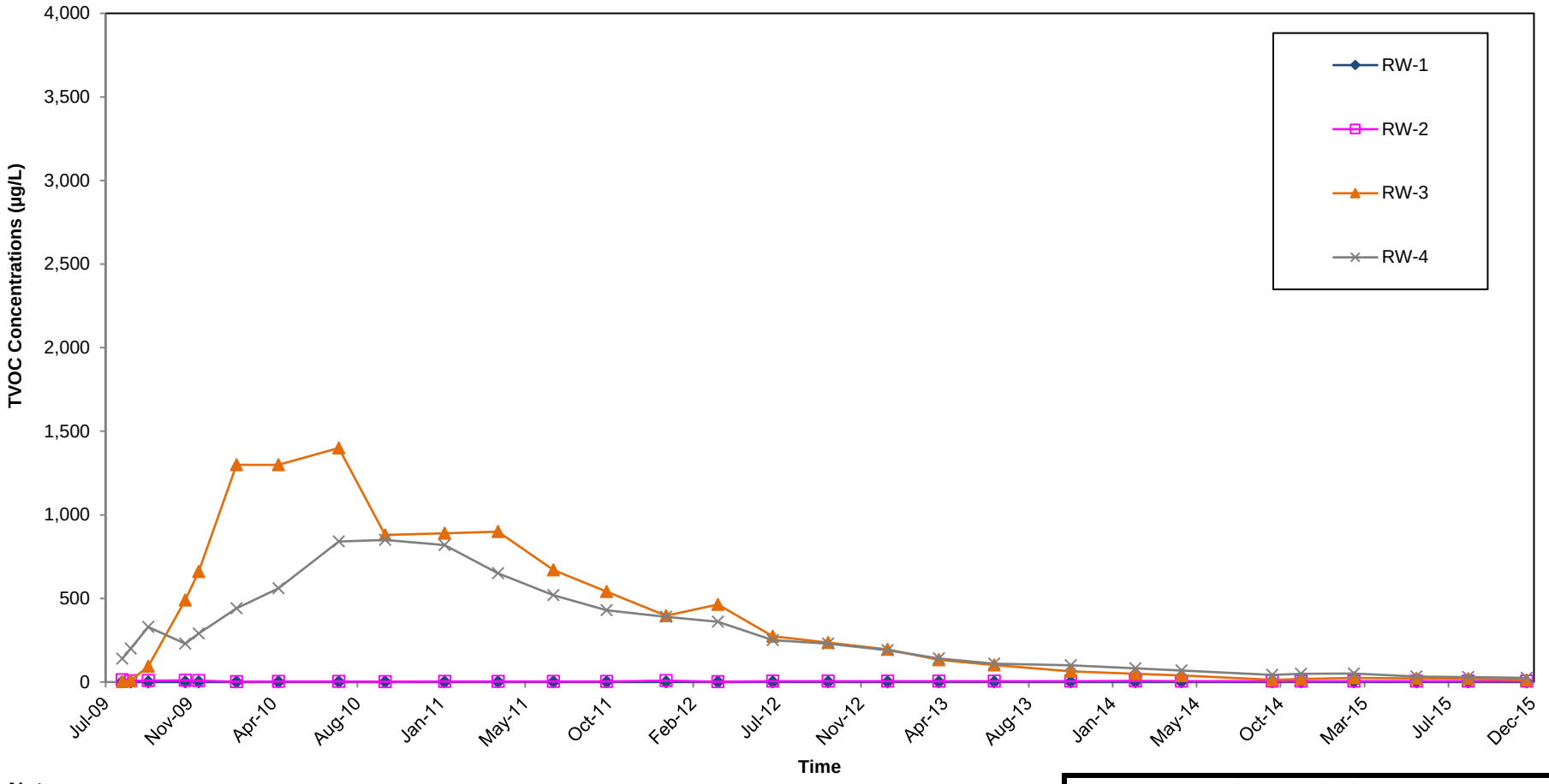
Project VOCs = Sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene and total xylenes.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL PROJECT VOC CONCENTRATIONS THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6B



Notes:

VOC = Volatile organic compound.

µg/L = Micrograms per liter.

TVOCs = Sum of VOCs detected.

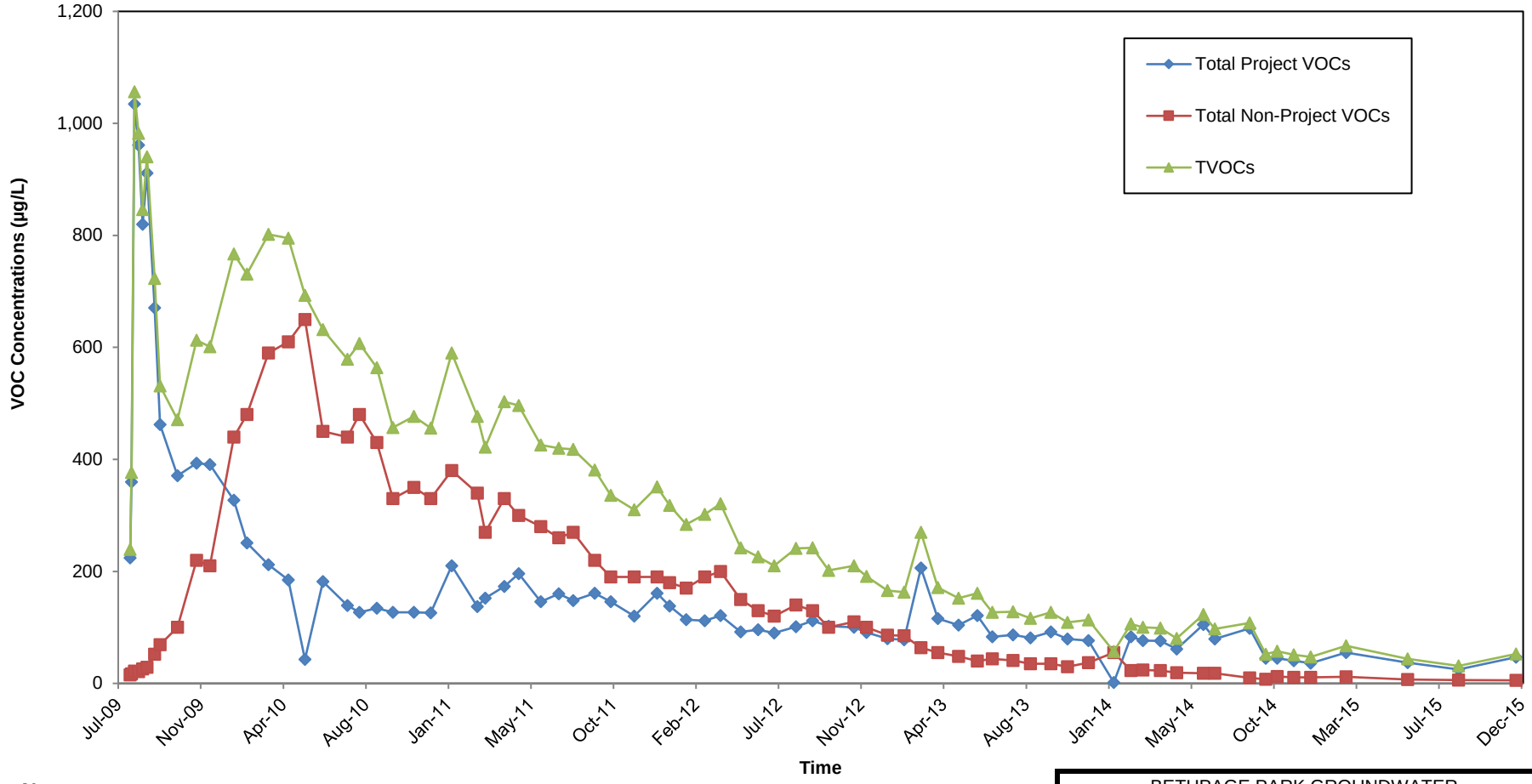
Non-Project VOCs = Sum of TVOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

REMEDIAL WELL NON-PROJECT VOC CONCENTRATIONS THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6C



Notes:

VOC = Volatile organic compound.

µg/L = Micrograms per liter.

TVOCs = Sum of VOCs detected.

Project VOCs = Sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes.

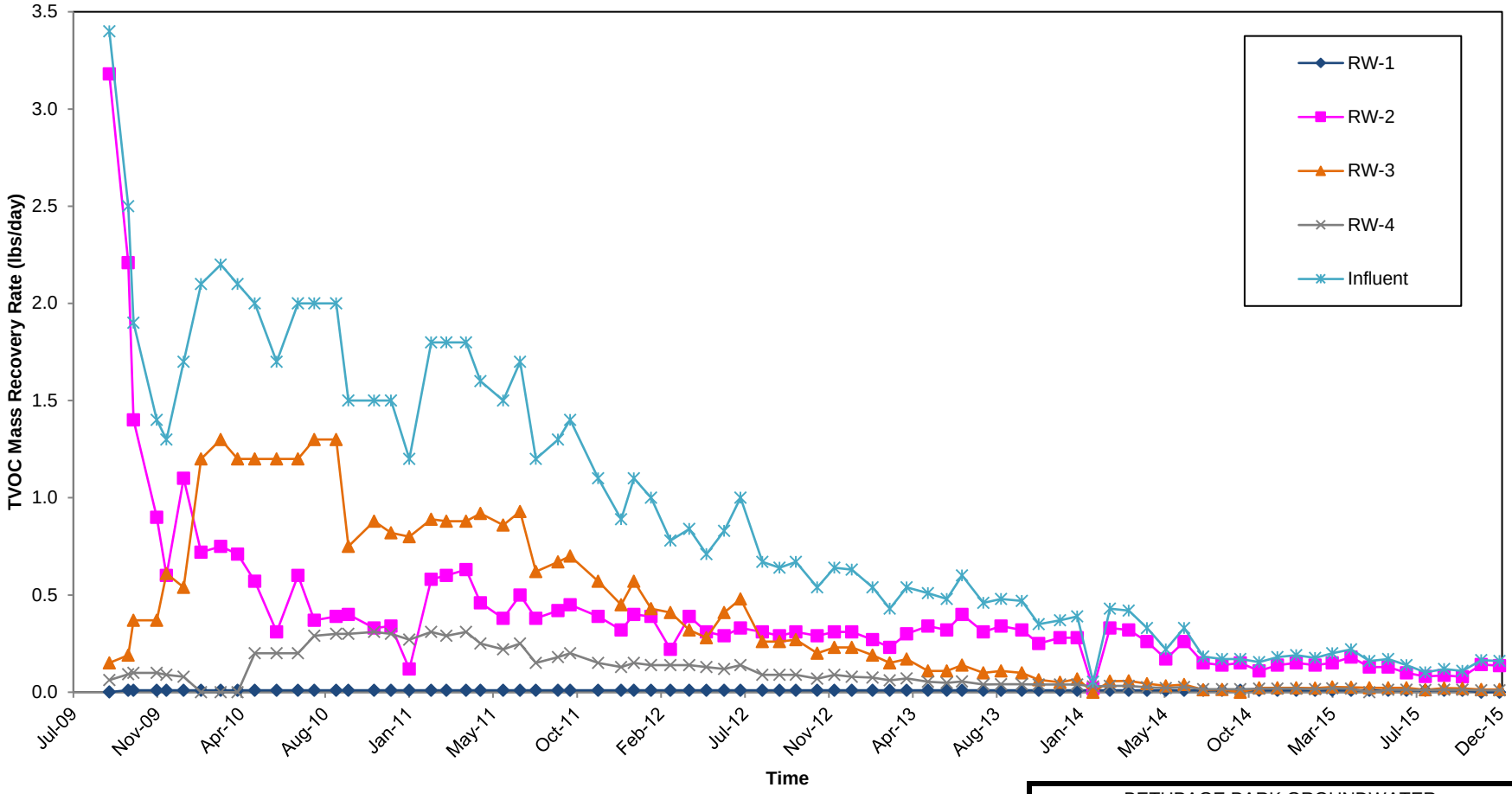
Non-Project VOCs = Sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

INFLUENT TOTAL, PROJECT, AND NON-PROJECT VOC CONCENTRATIONS THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
7



Notes:

VOC = Volatile organic compound.

lbs/day = Pounds per day.

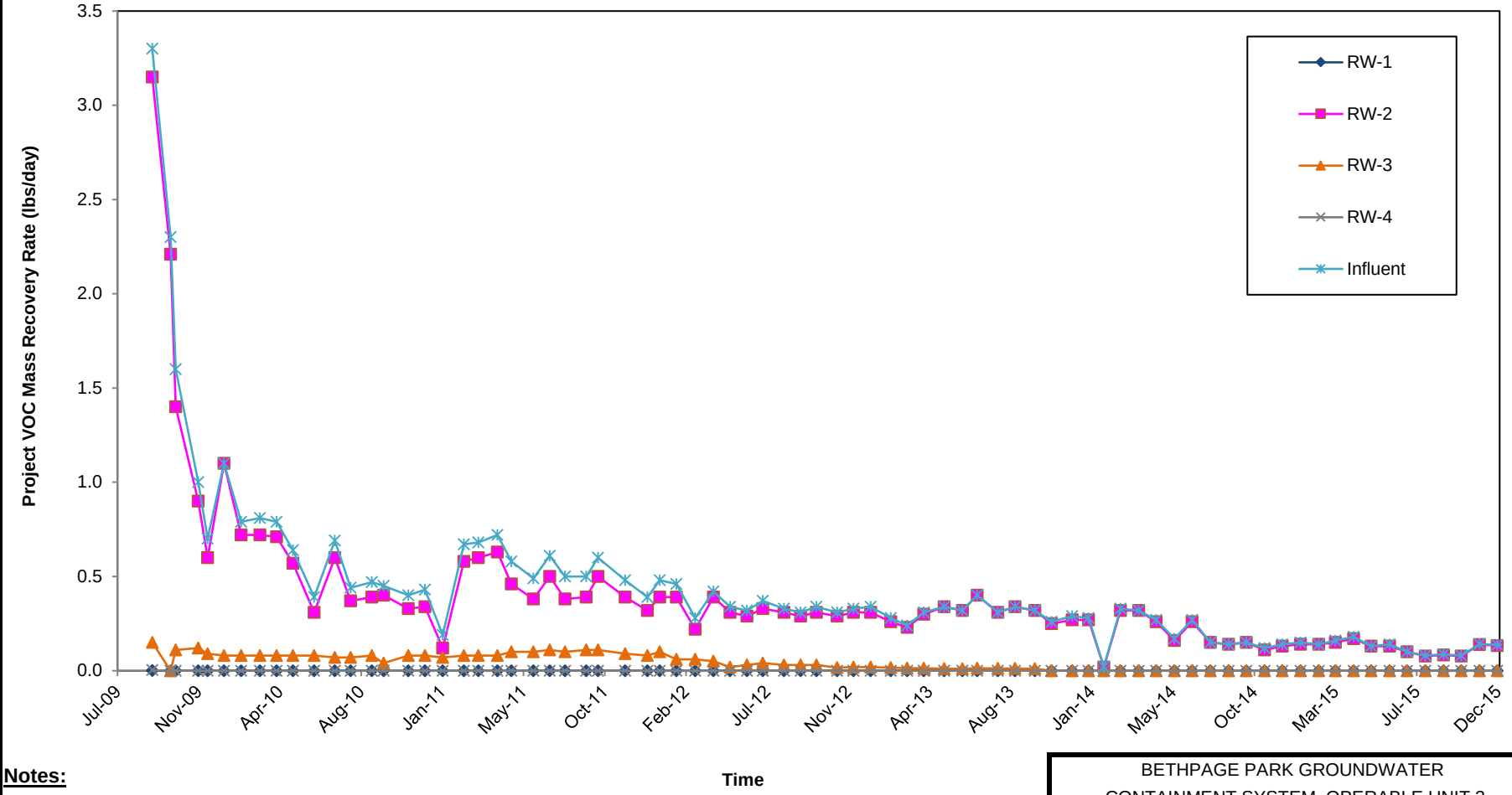
TVOCs = Sum of VOCs detected.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

TVOC MASS RECOVERY RATES THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
8A



Notes:

VOC = Volatile organic compound.

lbs/day = Pounds per day.

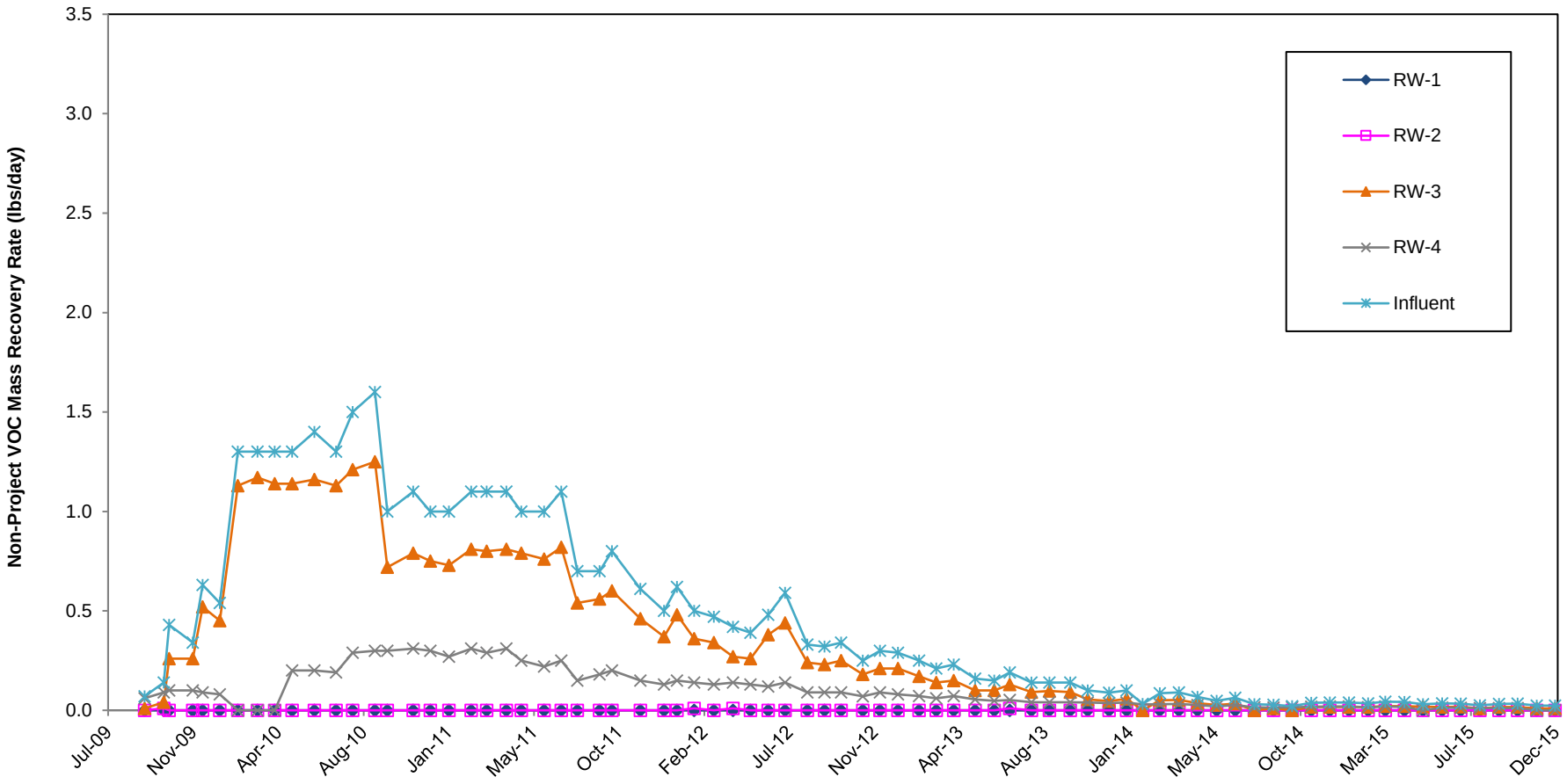
Project VOCs = Sum of 1,1,1-trichloroethane; 1,1-dichloroethane; 1,2-dichloroethane; 1,1-dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride; cis-1,2-dichloroethene; trans-1,2-dichloroethene; benzene; toluene; and total xylenes

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

PROJECT VOC MASS RECOVERY RATES THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
8B



Notes:

VOC = Volatile organic compound.

lbs/day = Pounds per day.

Non-Project VOCs = Sum of VOCs that are not Project VOCs.

BETHPAGE PARK GROUNDWATER
CONTAINMENT SYSTEM, OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

NON-PROJECT VOC MASS RECOVERY RATES THROUGH DECEMBER 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
8C

APPENDIX A

Well Construction Information and Environmental Effectiveness Monitoring Program

Appendix A-1
Well Construction Information and Environmental Effectiveness Monitoring Program, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds) Northrop Grumman systems Corporation, Bethpage, New York [1,2]

Well ID	Well Diameter (inches)	Depth to Screen Top (ft bls)	Depth to Screen Bottom (ft bls)	Screen Length (ft)	Well Depth (ft)	Well Materials	Water Levels [3]	Monitoring Activity: Water Quality [4] VOC	Monitoring Activity: Water Quality [4] Cd/Cr	Monitoring Activity: Water Quality [4] Fe/Mn
Monitoring Wells										
BCPMW-1	2	50	65	15	65	Sch. 40 PVC	Quarterly	Baseline	Baseline	--
BCPMW-2	2	60	75	15	75	Sch. 40 PVC	Quarterly	Baseline	Baseline	Baseline
BCPMW-3	2	59	74	15	74	Sch. 40 PVC	Quarterly	Baseline	Baseline	Baseline
BCPMW-4-1	4	45	65	20	70	Sch. 40 PVC	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	Baseline
BCPMW-4-2	4	68.5	83.5	15	88.5	Sch. 40 PVC	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	Baseline
BCPMW-4-3	4	115	125	10	130	Sch. 40 PVC	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	Baseline
BCPMW-5-1	4	50	65	15	70	Sch. 80 PVC/SS	Quarterly	Baseline	Baseline	Baseline
BCPMW-6-1	4	88.5	98.5	10	103.5	Sch. 40 PVC	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	--
BCPMW-6-2	4	133	143	10	148	Sch. 40 PVC	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	--
BCPMW-7-1	4	90	100	10	105	Sch. 40 PVC	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	--
B24MW-2	2	54	74	20	74	PVC	Quarterly	Baseline/Annual	Baseline	--
B24MW-3	2	55	70	15	70	PVC	Quarterly	Baseline/Annual	Baseline	--
B30MW-1	2	57	72	15	72	PVC	Quarterly	Baseline/Annual	Baseline	--
MW-200-1	4	85	95	10	100	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	--
MW-201-1	4	70	80	10	85	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	--
MW-202-1	4	125	135	10	140	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	--
MW-203-1	4	103	113	10	118	Sch. 40 PVC/SS	Quarterly	Baseline/Semiannual [5]	Baseline/Annual	--
Remedial Wells [6]										
RW-01	8	108	128	20	134	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--
RW-02	6	84	104	20	104	Steel/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--
RW-03	8	84	104	20	107	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--
RW-04	8	110	130	20	133	Sch. 80 PVC/SS	Quarterly	Baseline/Quarterly	Baseline/Annual	--

Appendix A-1
Well Construction Information and Environmental Effectiveness Monitoring Program, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds) Northrop Grumman systems Corporation, Bethpage, New York [1,2]

Well ID	Well Diameter (inches)	Depth to Screen Top (ft bls)	Depth to Screen Bottom (ft bls)	Screen Length (ft)	Well Depth (ft)	Well Materials	Water Levels [3]	Monitoring Activity: Water Quality [4] VOC	Monitoring Activity: Water Quality [4] Cd/Cr	Monitoring Activity: Water Quality [4] Fe/Mn
Piezometers										
PZ-01a	2	60	65	5	68	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-01b	1	80	85	5	88	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-01c	1	130	135	5	138	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-02a	2	60	65	5	68	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-02b	1	80	85	5	85	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-02c	1	130	135	5	138	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-03	1	80	85	5	88	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-04	1	80	85	5	88	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-05a	2	65	70	5	74	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-05b	1	110	115	5	117	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-06a	2	65	70	5	72	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-06b	1	90	95	5	97	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-07a	2	65	70	5	72	Sch. 40 PVC/SS	Quarterly	--	--	--
PZ-07b	1	113	118	5	120	Sch. 40 PVC/SS	Quarterly	--	--	--

Notes:

(1) Water samples will be collected and analyzed in accordance with the method and procedures described in the Sampling and Analysis Plan (SAP).

(2) Approximate locations of the wells and piezometers in the OU3 Bethpage Park Groundwater Containment System are shown in Figure 4.

(3) Water levels will be measured in all wells/piezometers during the baseline monitoring event. Water levels will be measured in accordance with the procedures presented in the SAP.

(4) VOC: VOC analyses per NYSDEC ASP 2005, Method OLM 4.3 (prior to September 1, 2014) and per USEPA Method 8260C (after September 1, 2014).
Cd/Cr: Cadmium and Chromium using USEPA Method 6010C.
Fe/Mn: Iron and Manganese using USEPA Method 6010C, both total and dissolved.

(5) Semiannual wells will be monitored annually after Year 1.

(6) Some of the analyses listed here are also covered in the Remedial System Sampling Program (Table B-1) and some of the analyses and/or frequencies may be modified based on review of short-term and/or long-term testing results. (e.g. the Cd/Cr sampling frequency was changed from quarterly to annually in 2011).

Acronyms\Key:

Sch. 80 PVC	Schedule 80 polyvinyl chloride.	ft bls	Feet below land surface.
Sch. 40 PVC	schedule 40 polyvinyl chloride.	--	Not applicable.
SS	Stainless steel.	VOC	Volatile organic compound.
Steel	Low carbon steel.	NYSDEC	New York State Department of Enviromental Conservation
ft	Feet.	USEPA	United States Environmental Protection Agency
ft ms	Feet relative to mean sea level.		

APPENDIX B

Compliance and Performance Program and Water Sample Analytical Results

ARCADIS Design & Consultancy for natural and built assets

Sample Location/Instrument [1]	Parameter (Method) [2]	Frequency			
		Short-Term [3] (first month)	Short-Term [3] (five month period following first month)	Long-Term [4]	SCADA Data Acquisition
Water Samples [5]					
Remedial Well 1 (WSP-1)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]				
	---		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Remedial Well 2 (WSP-2)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]				
	---		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Remedial Well 3 (WSP-3)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]				
	---		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Remedial Well 4 (WSP-4)	VOCs (USEPA Method 8260C)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]				
	---		Annually	Annually	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Air Stripper Influent (WSP-5)	VOCs (USEPA Method 8260C)	1-hr [6]; Days 1, 3, & Weekly	Monthly	Quarterly	NA
	Iron (USEPA 6010C)	1-hr [6]; Days 1, 3, & Weekly	Monthly	Quarterly	NA
	1,4-Dioxane (USEPA Method B8270)		Quarterly	Quarterly	NA
Air Stripper Effluent (WSP-6)	Iron (USEPA 6010C)	1-hr [6]; As Needed	As Needed	As Needed	NA
Plant Effluent (WSP-7)	**VOCs (USEPA Method 8260C)**	**1-hr [6]; Days 1, 3, & Weekly**	**Monthly**	**Monthly**	NA
	Iron (USEPA 6010C)	**1-hr [6]; Days 1, 3, & Weekly**	**Monthly**	**Monthly**	NA
	Mercury (USEPA 7470A) [7]	**1-hr [6]; Days 1, 3, & Weekly**	**Monthly**	**Monthly**	NA
	1,4-Dioxane (USEPA Method B8270)		**Monthly**	**Monthly**	NA
	pH (field) [8]	**1-hr [6]; Days 1, 3, & Weekly**	**Monthly**	**Monthly**	NA
	and		Quarterly	Quarterly	NA
Air Samples [9] [10]					
Air Stripper Effluent/ECU-1 Influent (VSP-1)	VOCs (TO-15 Modified)	Monthly	Monthly	Quarterly	NA
ECU-1 Effluent/ECU-2 Influent (VSP-2)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
ECU-2 Effluent/ECU-3 Influent (VSP-3)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
ECU-3 Effluent/ECU-4 Influent (VSP-4)	VOCs (TO-15 Modified)	As Needed	As Needed	As Needed	NA
Total Effluent (VSP-5)	**VOCs (TO-15 Modified)**	**Monthly**	**Monthly**	**Quarterly**	NA

See notes on last page.

Sample Location/Instrument [1]	Parameter (Method) [2]	Frequency			
		Short-Term [3] (first month)	Short-Term [3] (five month period following first month)	Long-Term [4]	SCADA Data Acquisition
Water Flow Measurements					
Remedial Well RW-1 (FT - 110)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-2 (FT - 120)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-3 (FT - 130)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-4 (FT - 140)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Combined Influent (FR - 200)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
System Effluent (FT-700)	Flow rate (gpm + total gal.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Air Flow Measurements					
Air Stripper Effluent (FT-500)	Flow rate (SCFM)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Water Pressure Measurements					
Remedial Well RW-1 (PT - 110)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-2 (PT - 120)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-3 (PT - 130)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Remedial Well RW-4 (PT - 140)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Air Stripper Effluent (PT-700)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Weekly	Weekly	Continuously
Air Temperature & Relatively Humidity Measurements					
Air Stripper Effluent (TT-500)	Temperature	Weekly	Weekly	Weekly	Continuously
ECU Mid-Train (TI-503)	Temperature	Weekly	Weekly	Weekly	NA
Effluent (TI-603)	Temperature	Weekly	Weekly	Weekly	NA
Air Pressure Measurements					
Air Stripper Effluent (PT-500)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	Continuously
ECU #1 Influent (PI-501)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
ECU #2 Influent (PI-502)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
ECU #3 Influent (PI-601)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
ECU #4 Influent (PI-602)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA
System Effluent (PI-603)	Pressure (i.w.g.)	(Daily -1st week) Weekly	Monthly	Quarterly	NA

See notes on last page.

Sample Location/Instrument [1]	Parameter (Method) [2]	Frequency			
		Short-Term [3] (first month)	Short-Term [3] (five month period following first month)	Long-Term [4]	SCADA Data Acquisition

Notes:

(1) Refer to Figure 3 of this Operation, Maintenance, & Monitoring (OM&M) Report and Appendix E of the Groundwater IRM OM&M Manual (OM&M Manual (ARCADIS 2009)) for a diagram showing referenced sample locations and measurement points.
(2) Parameters/methods may be modified based on review of short-term and/or long-term testing results. Parameters shown in **Bold** indicate parameters that require NYSDEC notification/approval prior to change in monitoring schedule.
(3) Short-term schedule is tentative. Modification may be required/recommended based on the results of start-up and performance testing.
(4) Long-term schedule is tentative. Modification may be required/recommended based on the results of short-term testing or water quality trends.
(5) Water samples will be collected in accordance with the methods described in the Sampling and Analysis Plan, which is included as Appendix A of the OM&M Manual (ARCADIS 2009). Samples will be analyzed in accordance with the methods and procedures described in the Sampling and Analysis Plan.
(6) Per NYSDEC request, a 1-hr pilot test was performed during system shake-down. The 1-hr pilot test samples were also analyzed for Mercury (Hg).
(7) Per the interim treated effluent (water) discharge criteria provided in the NYSDEC letter dated March 19, 2009, select samples were analyzed for Mercury (Hg).
(8) As authorized by the NYSDEC, the pH monitoring frequency was reduced from weekly to monthly beginning on February 8, 2010.
(9) Air samples collected and analyzed in accordance with methods described in the Sampling and Analysis Plan, which is included as Appendix A of the OM&M Manual (ARCADIS 2009).
(10) Additional air samples will be collected to help calculate media usage rates and to help determine media changeout frequencies.
(11) Cadium and Chromium analyses are part of the Environmental Effectiveness Monitoring Program (Table A-1) and the original discharge permit application. They are included here for consistency.

Acronyms\Key:

NA	Not Applicable.
---	Not Required
ECU	Emissions control unit.
VOCs	Volatile organic compounds (refer Tables D-3 and D-5 in the Quality Assurance Project Plan (QAPP) (Appendix D of the OM&M Manual (ARCADIS 2009)) for the analyte lists for aqueous and air samples, respectively).
gal.	Gallons.
gpm	Gallons per minute.
i.w.g.	Inches water gauge.
NYSDEC	New York State Department of Environmental Conservation.
EPA	U.S. Environmental Protection Agency.
SCADA	Supervisory Control And Data Acquisition.
OM&M	Operation, maintenance and monitoring.

Appendix B-2
Water Sample Analytical Results - October 13, 2015, Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York [1,2,3]

COMPOUND (µg/L)	Sample ID: Sample Location: Sample Date:	WSP-07 Effluent 10/13/2015
Volatile Organic Compounds		
1,1,1-Trichloroethane		< 1.0 U
1,1,2,2-Tetrachloroethane		< 1.0 U
1,1,2-Trichloroethane		< 1.0 U
1,1-Dichloroethane		< 1.0 U
1,1-Dichloroethene		< 1.0 U
1,2-Dichloroethane		< 1.0 U
1,2-Dichloropropane		< 1.0 U
2-Butanone		< 10 U
4-Methyl-2-Pentanone		< 5.0 U
Acetone		< 10 U
Benzene		< 0.50 U
Bromodichloromethane		< 1.0 U
Bromoform		< 1.0 U
Bromomethane		< 2.0 U
Carbon Disulfide		< 2.0 U
Carbon Tetrachloride		< 1.0 U
Chlorobenzene		< 1.0 U
Chlorodibromomethane		< 1.0 U
Chlorodifluoromethane (Freon 22)		< 5.0 U
Chloroethane		< 1.0 U
Chloroform		< 1.0 U
Chloromethane		< 1.0 U
cis-1,2-Dichloroethene		< 1.0 U
cis-1,3-Dichloropropene		< 1.0 U
Dichlorodifluoromethane (Freon 12)		< 2.0 U
Dichloromethane		< 2.0 U
Ethylbenzene		< 1.0 U
Methyl N-Butyl Ketone		< 5.0 U
Methyl-Tert-Butylether		< 1.0 U
Styrene (Monomer)		< 1.0 U
Tetrachloroethene		< 1.0 U
Toluene		< 1.0 U
trans-1,2-Dichloroethene		< 1.0 U
trans-1,3-Dichloropropene		< 1.0 U
Trichloroethene		< 1.0 U
Trichlorofluoromethane (Freon 11)		< 2.0 U
Trichlorotrifluoroethane (Freon 113)		< 5.0 U
Vinyl Chloride		< 1.0 U
Xylene-o		< 1.0 U
Xylenes - m,p		< 1.0 U
1,4-Dioxane		**0.34**
Tentatively Identified Compounds		0
Total VOCs [4]		0

See notes on last page.

COMPOUND (µg/L)	Sample ID: Sample Location: Sample Date:	WSP-07 Effluent 10/13/2015
Metals		
Cadmium (Dissolved)		--
Cadmium (Total)		--
Chromium (Dissolved)		--
Chromium (Total)		**--**
Iron (Dissolved)		**235**
Iron (Total)		**297**
Manganese (Dissolved)		--
Manganese (Total)		--
Mercury (Dissolved)		--
Mercury (Total)		**--**

Notes:

(1) Water samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per USEPA Method 8260C, for iron analyses per USEPA Method 6010C and for mercury analyses per USEPA Method 7470A.
(2) Refer to Figure 3 of this OM&M Report for schematic sample locations.
(3) Results validated following protocols specified in the Sampling and Analysis Plan (Appendix A) of the Groundwater OM&M Manual (ARCADIS
(4) "Total VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, maintenance and monitoring.
U	Compound was analyzed for but not detected.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

COMPOUND (µg/L)	Sample ID: Sample Location: Sample Date:	WSP-01 RW-1 11/23/2015	WSP-02 RW-2 11/23/2015	WSP-03 RW-3 11/23/2015	WSP-04 RW-4 11/23/2015	WSP-05 Influent 11/23/2015[5]	WSP-07 Effluent 11/23/2015
Volatile Organic Compounds							
1,1,1-Trichloroethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1-Dichloroethane		< 1.0 U	**0.84 J**	< 1.0 U	**0.30 J**	**0.36 J**	< 1.0 U
1,1-Dichloroethene		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloropropane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone		< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
4-Methyl-2-Pentanone		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Acetone		< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Benzene		< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U	< 0.50 U
Bromodichloromethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromoform		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Disulfide		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon Tetrachloride		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodibromomethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorodifluoromethane (Freon 22)		< 5.0 U	< 5.0 U	**7.1**	**24.8**	**5.5**	< 5.0 U
Chloroethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform		< 1.0 U	**3.1**	**5.2**	**0.28 J**	**2.7**	< 1.0 U
Chloromethane		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene		< 1.0 U	**59**	**1.8**	< 1.0 U	**18.9**	< 1.0 U
cis-1,3-Dichloropropene		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane (Freon 12)		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Dichloromethane		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Ethylbenzene		< 1.0 U	**1.9**	< 1.0 U	< 1.0 U	**0.59 J**	< 1.0 U
Methyl N-Butyl Ketone		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Methyl-Tert-Butylether		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene (Monomer)		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene		< 1.0 U	< 1.0 U	< 1.0 U	**0.62 J**	< 1.0 U	< 1.0 U
Toluene		< 1.0 U	**27.6**	< 1.0 U	< 1.0 U	**7.6**	< 1.0 U
trans-1,2-Dichloroethene		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene		< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene		< 1.0 U	**9.9**	**2.2**	**0.61 J**	**3.9**	< 1.0 U
Trichlorofluoromethane (Freon 11)		< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Trichlorotrifluoroethane (Freon 113)		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Vinyl Chloride		< 1.0 U	**50**	< 1.0 U	< 1.0 U	**15.4**	< 1.0 U
Xylene-o		< 1.0 U	**0.95 J**	< 1.0 U	< 1.0 U	0.27 J	< 1.0 U
Xylenes - m,p		< 1.0 U	**1.8**	< 1.0 U	< 1.0 U	0.55 J	< 1.0 U
1,4-Dioxane		**0.21 J**	**0.54**	**0.12 J**	<0.22 U	**0.33**	**0.34**
Tentatively Identified Compounds		0	0	0	0	0	0
Total VOCs [4]		0	**155**	**16**	**27**	**55**	0

See notes on last page.

COMPOUND (µg/L)	Sample ID: Sample Location: Sample Date:	WSP-01 RW-1 11/23/2015	WSP-02 RW-2 11/23/2015	WSP-03 RW-3 11/23/2015	WSP-04 RW-4 11/23/2015	WSP-05 Influent 11/23/2015[5]	WSP-07 Effluent 11/23/2015
Metals							
Cadmium (Dissolved)		< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U
Cadmium (Total)		< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U	< 3.0 U
Chromium (Dissolved)		**30.8**	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Chromium (Total)		**29.4**	< 10 U	< 10 U	< 10 U	**11.5**	< 10 U
Iron (Dissolved)		< 100 U	**741**	< 100 U	< 100 U	**195**	**184**
Iron (Total)		< 100 U	**817**	**203**	< 100 U	**2050**	**275**
Manganese (Dissolved)		--	--	--	--	--	--
Manganese (Total)		--	--	--	--	--	--
Mercury (Dissolved)		--	--	--	--	--	--
Mercury (Total)		--	--	--	--	--	< 0.20 U

Notes:

(1) Water samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per USEPA Method 8260C, for iron analyses per USEPA Method 6010C and for mercury analyses per USEPA Method 7470A.
(2) Refer to Figure 3 of this OM&M Report for schematic sample locations.
(3) Results validated following protocols specified in the Sampling and Analysis Plan (Appendix A) of the Groundwater OM&M Manual (ARCADIS 2009).
(4) "Total VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.
(5) WSP-5 sample for volatile organics collected on November 30, 2015.

Acronyms\Key:

Bold value indicates a detection.

dup.	Duplicate.
ELAP	Environmental Laboratory Approval Program
J	Estimated value.
NYSDOH	New York State Department of Health
OM&M	Operation, maintenance and monitoring.
U	Compound was analyzed for but not detected.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

Appendix B-4
Water Sample Analytical Results - December 22, 2015, Bethpage Park Groundwater Containment System, Operable Unit 3
(Former Grumman Settling Ponds), Bethpage, New York [1,2,3]

COMPOUND (µg/L)	Sample ID: Sample Location: Sample Date:	WSP-07 Effluent 12/22/2015
Volatile Organic Compounds		
1,1,1-Trichloroethane		< 1.0 U
1,1,2,2-Tetrachloroethane		< 1.0 U
1,1,2-Trichloroethane		< 1.0 U
1,1-Dichloroethane		< 1.0 U
1,1-Dichloroethene		< 1.0 U
1,2-Dichloroethane		< 1.0 U
1,2-Dichloropropane		< 1.0 U
2-Butanone		< 10 U
4-Methyl-2-Pentanone		< 5.0 U
Acetone		< 10 U
Benzene		< 0.5 U
Bromodichloromethane		< 1.0 U
Bromoform		< 1.0 U
Bromomethane		< 2.0 U
Carbon Disulfide		< 2.0 U
Carbon Tetrachloride		< 1.0 U
Chlorobenzene		< 1.0 U
Chlorodibromomethane		< 1.0 U
Chlorodifluoromethane (Freon 22)		< 5.0 U
Chloroethane		< 1.0 U
Chloroform		< 1.0 U
Chloromethane		< 1.0 U
cis-1,2-Dichloroethene		< 1.0 U
cis-1,3-Dichloropropene		< 1.0 U
Dichlorodifluoromethane (Freon 12)		< 2.0 U
Dichloromethane		< 2.0 U
Ethylbenzene		< 1.0 U
Methyl N-Butyl Ketone		< 1.0 U
Methyl-Tert-Butylether		< 1.0 U
Styrene (Monomer)		< 1.0 U
Tetrachloroethene		< 1.0 U
Toluene		< 1.0 U
trans-1,2-Dichloroethene		< 1.0 U
trans-1,3-Dichloropropene		< 1.0 U
Trichloroethene		< 1.0 U
Trichlorofluoromethane (Freon 11)		< 2.0 U
Trichlorotrifluoroethane (Freon 113)		< 5.0 U
Vinyl Chloride		< 1.0 U
Xylene-o		< 1.0 U
Xylenes - m,p		< 1.0 U
1,4-Dioxane		**0.38**
Tentatively Identified Compounds		0
Total VOCs [4]		0

See notes on last page.

COMPOUND (µg/L)	Sample ID: Sample Location: Sample Date:	WSP-07 Effluent 12/22/2015
Metals		
Cadmium (Dissolved)		--
Cadmium (Total)		--
Chromium (Dissolved)		--
Chromium (Total)		--
Iron (Dissolved)		**184**
Iron (Total)		**275**
Manganese (Dissolved)		--
Manganese (Total)		--
Mercury (Dissolved)		--
Mercury (Total)		--

Notes:

(1) Water samples collected by Arcadis on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per USEPA Method 8260C, for iron analyses per USEPA Method 6010C and for mercury analyses per USEPA Method 7470A.
(2) Refer to Figure 3 of this OM&M Report for schematic sample locations.
(3) Results validated following protocols specified in the Sampling and Analysis Plan (Appendix A) of the Groundwater OM&M Manual (ARCADIS
(4) "Total VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

ELAP	Environmental Laboratory Approval Program
NYSDOH	New York State Department of Health
OM&M	Operation, maintenance and monitoring.
U	Compound was analyzed for but not detected.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
µg/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

APPENDIX C

Vapor Sample Analytical Results

Appendix C-1. Vapor Sample Analytical Results - November 23, 2015, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1,2,3]

COMPOUND (ug/m^3)	Location ID: / Sample Location: / Sample Date:	VSP-1 Influent 11/23/2015	VSP-5 Effluent 11/23/2015
Volatile Organic Compounds			
1,1,1-Trichloroethane		**0.82**	< 0.55 U
1,1,2,2-Tetrachloroethane		< 0.69 U	< 0.69 U
1,1,2-Trichloroethane		< 0.55 U	< 0.55 U
1,1-Dichloroethane		**5.3**	**2.3**
1,1-Dichloroethene		**2.0**	**0.79**
1,2-Dichloroethane		**0.45 J**	< 0.81 U
1,2-Dichloropropane		< 0.92 U	< 0.92 U
1,3-Butadiene		< 0.44 U	< 0.44 U
1-Chloro-1,1-difluoroethane		< 0.82 U	< 0.82 U
2-Butanone		**2.2**	**39.5**
4-Methyl-2-Pentanone		< 0.82 U	< 0.82 U
Acetone		**5.0**	**1060 D**
Benzene		**0.77**	**29**
Bromodichloromethane		< 0.67 U	< 0.67 U
Bromoform		< 0.41 U	< 0.41 U
Bromomethane		< 0.78 U	< 0.78 U
Carbon Disulfide		< 0.62 U	< 0.62 U
Carbon Tetrachloride		< 0.25 U	< 0.25 U
Chlorobenzene		< 0.92 U	< 0.92 U
Chlorodibromomethane		< 0.85 U	< 0.85 U
Chlorodifluoromethane (Freon 22)		**48.2**	**52.1**
Chloroethane		< 0.53 U	< 0.53 U
Chloroform		**41**	**6.8**
Chloromethane		**1.0**	**5.8**
cis-1,2-Dichloroethene		**290 D**	**2.6**
cis-1,3-Dichloropropene		< 0.91 U	< 0.91 U
Dichlorodifluoromethane (Freon 12)		**2.4**	**2.6**
Dichloromethane		**0.52 J**	< 0.69 U
Ethylbenzene		**7.8**	**0.83 J**
Methyl N-Butyl Ketone		**0.53 J**	**2.2**
Methyl tert-Butyl Ether		**0.76**	< 0.72 U
Styrene		< 0.85 U	< 0.85 U
Tetrachloroethene		**4.5**	**1.8**
Toluene		**131**	**15**
trans-1,2-Dichloroethene		**0.59 J**	< 0.79 U
trans-1,3-Dichloropropene		< 0.91 U	< 0.91 U
Trichloroethene		**55.4**	**1.5**
Trichlorofluoromethane (Freon 11)		**1.5**	**1.9**
Trichlorotrifluoroethane (Freon 113)		**2.5**	< 0.77 U
Vinyl Chloride		**181 D**	**4.3**
Xylene - o		**3.2**	**1.0**
Xylenes - m,p		**7.8**	**2.1**
Total VOCs		**796**	**1232**

See notes on last page.

Appendix C-1. Vapor Sample Analytical Results - November 23, 2015, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1,2,3]

	Location ID:	VSP-1	VSP-5
	Location ID:	VSP-1	VSP-5
COMPOUND	Sample Location:	Influent	Effluent
(ppb)	Sample Date:	8/19/2015	8/19/2015
Tentatively Identified Compounds			
2,6-Dimethylundecane		--	**30 JN**
2-butyl-1,1,3-trimethyl-cyclohexane		--	**9.9 JN**
2-Methylundecane		--	**43 JN**
3-Methylundecane		--	**36 JN**
4-Methylundecane		--	**31 JN**
Acetophenone		--	**22 JN**
alkane		--	**51 JN**
alkane		--	**28 JN**
alkane		--	**24 JN**
alkane		--	**17 JN**
alkane		--	**17 JN**
alkane		--	**16 JN**
alkane		--	**14 JN**
alkene		--	**11 JN**
N-Undecane		--	**36 JN**
Unknown		--	**21 JN**
Unknown		--	**9.4 JN**
UNKNOWN VOA ALKENE1		--	**29 JN**
UNKNOWN VOA ALKENE2		--	**22 JN**
UNKNOWN VOA ALKENE3		--	**18 JN**

Notes:

(1) Vapor samples collected by ARCADIS on the dates shown and submitted to a NYSDOH ELAP certified laboratory for VOC analyses per Modified USEPA Method TO-15.

(2) Refer to Figure 3 of this OM&M Report for schematic sample locations.

(3) Results validated following protocols specified in the Sampling and Analysis Plan

(4) "Total VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

D	Concentration is based on a diluted sample analysis.
J	Estimated value.
ELAP	Environmental Laboratory Approval Program.
J	Compound concentration is estimated.
JN	Compound tentatively identified, concentration is estimated.
OM&M	Operation, maintenance and monitoring.
NYSDEC	New York State Department of Environmental Conservation.
NYSDOH	New York State Department of Health.
TIC	Tentatively identified compound.
U	Compound was analyzed for but not detected.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/m^3	Micrograms per cubic meter.
< 1.5 U	Compound not detected above its laboratory quantification limit.
--	TIC not detected.

APPENDIX D

Air Discharge Quality Evaluation

Appendix D-1. Summary of SCREEN3 Model Input and Outputs, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Parameters	Date Sampled:	2/12/2015	5/26/2015	8/19/2015	11/23/2015
SCREEN3 Model Input					
Source Type		Point	Point	Point	Point
Emission Rate (g/s)		1	1	1	1
Stack Height (ft)		13.5	13.5	13.5	13.5
Stack Height (m)		4.1	4.1	4.1	4.1
Stack Inside Diameter (m)		0.36	0.36	0.36	0.36
Air Flow Rate (scfm)[1,9]		1,891	1,819	1,790	1,919
Air Flow Rate (acfm @ stack temp)[2,9]		1,882	1,859	1,836	1,923
Stack Gas Exit Temperature (K)[1,9]		293	301	302	295
Ambient Air Temperature (K)[3]		271	293	300	276
Receptor Height (m)[4]		1.5	1.5	1.5	1.5
Urban/Rural		Urban	Urban	Urban	Urban
Building Height (m)		2.6	2.6	2.6	2.6
Min Horizontal Bldg Dim (m)		7.9	7.9	7.9	7.9
Max Horizontal Bldg Dim (m)		9.8	9.8	9.8	9.8
Consider Bldg Downwash?		Yes	Yes	Yes	Yes
Simple/Complex Terrain Above Stack		Simple	Simple	Simple	Simple
Simple/Complex Terrain Above Stack Base		Simple	Simple	Simple	Simple
Meteorology		Full	Full	Full	Full
Automated Distances Array		Yes	Yes	Yes	Yes
Terrain Height Above Stack Base		0	0	0	0
SCREEN3 Model Output					
1-HR Max Concentration at Receptor Height ($\mu g/m^3$) [5]		2,168	2,180	2,203	2,109
Annualization Factor[6]		0.08	0.08	0.08	0.08
Average Annual Concentration at Receptor Height ($\mu g/m^3$)[7]		173	174	176	169
Distance To Max Concentration (m)[8]		8	8	8	8

See notes on last page.

Notes:

(1) The stack air flow rate (in scfm) and temperature were measured using inline instrumentation. Values were measured at the blower effluent location.

(2) The stack air flow rate at the stack temperature (in acfm) was calculated by dividing the stack air flow rate in scfm by the ratio of the standard temperature to the actual stack gas exit temperature in degrees Rankine.

(3) The ambient temperature was recorded from the weather.newsday.com and/or weather underground (www.wunderground.com) websites for Islip, New York. The mean actual temperature from the website(s) was used in model calculation.

(4) The receptor height corresponds to the average inhalation level.

(5) SCREEN3 calculated constituent concentration at listed conditions at the specified inhalation level.

(6) A USEPA time averaging conversion factor of 1/0.08 was used to convert the 1-hour maximum concentration output to an annual average.

(7) Average annual constituent concentration at the receptor height was calculated by multiplying the one hour maximum concentration by the annualization factor.

(8) SCREEN3 calculated distance to the 1-hour maximum concentration.

(9) This data was not recorded for the 8/19/2015 event. Data from 8/24/2015 was used instead. This data was not recorded for the 12/10/2015 event. Data from 12/7/2015 was used instead.

Acronyms\Key:

$\mu g/m^3$	Micrograms per cubic meter.
acfm	Actual cubic feet per minute.
ft	Feet.
g/s	Grams per second.
K	Kelvin.
m	Meters.
scfm	Standard cubic feet per minute.
USEPA	United States Environmental Protection Agency.

Appendix D-2. Summary of Maximum Allowable Stack Concentration Calculations, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Actual Effluent Concentrations[1] (µg/m^3)			
	2/12/2015	5/26/2015	8/19/2015	11/23/2015
1,1 - Dichloroethane	5.3	0	0	2.3
1,1 - Dichloroethene	1.3	0	0	0.79
2-Butanone	16	11	44	40
Acetone	206	129	337	1,060
Chloroform	26	8.3	7.8	6.8
Ethylbenzene	0.78	0	0.83	0.83
Xylene - o	0.61	2.2	1.9	1.0
Xylenes - m,p	0.91	4.3	2.4	2.1
Chloromethane	6.6	2.9	20	5.8
Chloroethane	0	0	0.82	0
Methylene Chloride	0.83	0	1.1	0
Tetrachloroethene	0.81	3.7	0.40	1.8
Trichloroethene	4.4	2.7	1.8	1.5
Vinyl Chloride	97.9	0	14	4.3
cis 1,2-Dichloroethene	234	0	3.3	2.6
Benzene	5.1	4.5	36.7	29
Chlorobenzene	0	0	0.46	0
Toluene	11	20	7.5	15
2-Hexanone	0	0	0.70	2.2
Trichlorofluoromethane (Freon 11)	1.5	0	2.0	1.9
Dichlorodifluoromethane (Freon 12)	2.6	2.9	3.0	2.6
Chlorodifluoromethane (Freon 22)	103	91	69	52
Trichlorotrifluoroethane (Freon 113)	2.5	0	0	0

See notes on last page.

Appendix D-2. Summary of Maximum Allowable Stack Concentration Calculations, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	AGC[2] ($\mu g/m^3$)	MASC[3] ($\mu g/m^3$)			
		2/12/2015	5/26/2015	8/19/2015	11/23/2015
1,1 - Dichloroethane	0.63	4.09E+03	4.12E+03	4.13E+03	4.11E+03
1,1 - Dichloroethene	200	1.30E+06	1.31E+06	1.31E+06	1.31E+06
2-Butanone	5,000	3.25E+07	3.27E+07	3.27E+07	3.27E+07
Acetone	30,000	1.95E+08	1.96E+08	1.96E+08	1.96E+08
Chloroform	14.7	9.54E+04	9.61E+04	9.63E+04	9.60E+04
Ethylbenzene	1,000	6.49E+06	6.54E+06	6.55E+06	6.53E+06
Xylene - o	100	6.49E+05	6.54E+05	6.55E+05	6.53E+05
Xylenes - m,p	100	6.49E+05	6.54E+05	6.55E+05	6.53E+05
Chloromethane	90	5.84E+05	5.88E+05	5.89E+05	5.88E+05
Chloroethane	10,000	6.49E+07	6.54E+07	6.55E+07	6.53E+07
Methylene Chloride	60	3.90E+05	3.92E+05	3.93E+05	3.92E+05
Tetrachloroethene	4	2.60E+04	2.61E+04	2.62E+04	2.61E+04
Trichloroethene	0.2	1.30E+03	1.31E+03	1.31E+03	1.31E+03
Vinyl Chloride	0.068	4.42E+02	4.44E+02	4.45E+02	4.44E+02
cis 1,2 Dichloroethene	63	4.09E+05	4.12E+05	4.13E+05	4.11E+05
Benzene	0.13	8.44E+02	8.50E+02	8.51E+02	8.49E+02
Chlorobenzene	60	3.90E+05	3.92E+05	3.93E+05	3.92E+05
Toluene	5,000	3.25E+07	3.27E+07	3.27E+07	3.27E+07
2-Hexanone	30	1.95E+05	1.96E+05	1.96E+05	1.96E+05
Trichlorofluoromethane (Freon 11)	5,000	3.25E+07	3.27E+07	3.27E+07	3.27E+07
Dichlorodifluoromethane (Freon 12)	12,000	7.79E+07	7.84E+07	7.86E+07	7.84E+07
Chlorodifluoromethane (Freon 22)	50,000	3.25E+08	3.27E+08	3.27E+08	3.27E+08
Trichlorotrifluoroethane (Freon 113)	180,000	1.17E+09	1.18E+09	1.18E+09	1.18E+09

See notes on last page.

Appendix D-2. Summary of Maximum Allowable Stack Concentration Calculations, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Compound	Percent of MASC[4]			
	2/12/2015	5/26/2015	8/19/2015	11/23/2015
1,1 - Dichloroethane	0.13%	0.00%	0.00%	0.06%
1,1 - Dichloroethene	0.00%	0.00%	0.00%	0.00%
2-Butanone	0.00%	0.00%	0.00%	0.00%
Acetone	0.00%	0.00%	0.00%	0.00%
Chloroform	0.03%	0.01%	0.01%	0.01%
Ethylbenzene	0.00%	0.00%	0.00%	0.00%
Xylene - o	0.00%	0.00%	0.00%	0.00%
Xylenes - m,p	0.00%	0.00%	0.00%	0.00%
Chloromethane	0.00%	0.00%	0.00%	0.00%
Chloroethane	0.00%	0.00%	0.00%	0.00%
Methylene Chloride	0.00%	0.00%	0.00%	0.00%
Tetrachloroethene	0.00%	0.01%	0.00%	0.01%
Trichloroethene	0.34%	0.21%	0.14%	0.11%
Vinyl Chloride	22.17%	0.00%	3.14%	0.97%
cis 1,2 Dichloroethene	0.06%	0.00%	0.00%	0.00%
Benzene	0.60%	0.53%	4.31%	3.42%
Chlorobenzene	0.00%	0.00%	0.00%	0.00%
Toluene	0.00%	0.00%	0.00%	0.00%
2-Hexanone	0.00%	0.00%	0.00%	0.00%
Trichlorofluoromethane (Freon 11)	0.00%	0.00%	0.00%	0.00%
Dichlorodifluoromethane (Freon 12)	0.00%	0.00%	0.00%	0.00%
Chlorodifluoromethane (Freon 22)	0.00%	0.00%	0.00%	0.00%
Trichlorotrifluoroethane (Freon 113)	0.00%	0.00%	0.00%	0.00%

Notes/Acronyms:

(1) Actual effluent concentrations are analytical results from air samples collected on the dates shown.

(2) Compound-specific AGC values per the NYSDEC DAR-1 AGC/SGC tables, revised February 28, 2014.

(3) Maximum allowable stack concentrations were calculated by dividing the product of the annual guideline concentration of a compound and the ratio of the SCREEN3 gas emission rate and the SCREEN3 average concentration at receptor height by the air flow rate at the stack temperature and multiplying by the appropriate conversion factors.

(4) Percent of MASC was calculated by dividing the actual effluent concentration by the MASC for a given monitoring event.

$\mu g/m^3$ Micrograms per cubic meter

AGC Annual guideline concentration

MASC Maximum allowable stack concentration

Arcadis of New York, Inc.

Two Huntington Quadrangle

Suite 1S10

Melville, New York 11747

Tel 631 249 7600

Fax 631 249 7610

www.arcadis.com