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

2013 Annual Summary

Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York

NYSDEC ID # 1-30-003A

ARCADIS

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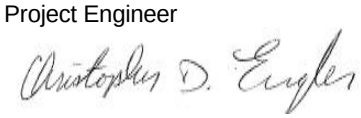

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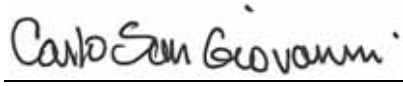

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2013 Annual Summary

1. Introduction

Pursuant to the Administrative Order on Consent (AOC) Index # W1-0018-04-01 (NYSDEC 2005) and the Operable Unit 3 (OU3) Record of Decision (ROD) (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 Operation, Maintenance, and Monitoring (OM&M) Report for submittal to the New York State Department of Environmental Conservation (NYSDEC). The present day Bethpage Community Park property (Park) and the Former Grumman 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. A Site Area Location map is provided as Figure 1.

The BPGWCS has been operational since July 21, 2009. This annual OM&M report summarizes the OM&M activities conducted, data collected, summary of system alarms, conclusions, recommendations, and engineering certification for the BPGWCS during 2013 (i.e., from January 1 to December 31, 2013). Additionally, this report summarizes the OM&M activities performed during the fourth Quarter of 2013 (i.e., October 1 through December 31, 2013 [the "fourth quarter reporting period"]). Detailed OM&M summaries for the previous three 2013 operational quarterly periods are available in the following reports (2013 Quarterly Reports):

- Quarterly OM&M Report for the BPGWCS, January 1 through March 31 (ARCADIS 2013a)
- Quarterly OM&M Report for the BPGWCS, April 1 through June 31 (ARCADIS 2013b)
- Quarterly OM&M Report for the BPGWCS, July 1 through September 30 (ARCADIS 2013c)

During 2013, Remedial System and Environmental Effectiveness Monitoring Programs were conducted in accordance with the NYSDEC-approved OU3 Interim Groundwater IRM OM&M Manual (OM&M Manual) (ARCADIS 2009) and the remedial well maintenance program described in the 2011 Annual Report (ARCADIS 2012).

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), which are present in the Site Area

groundwater. Throughout this report, a distinction is made between the "Project" and "Non-Project" Volatile Organic Compounds (VOCs), which are defined as follows:

- "Project VOCs:" VOCs that may be related to former Northrop Grumman historical activities. For this report, Project VOCs include 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:" VOCs, such as Freon 12 and Freon 22 that are understood to be unrelated to former Northrop Grumman activities but have been detected in the 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, Theodore 2007), Freon 22 was used by the Town and released to the environment.

2. Bethpage Park Groundwater Containment System Objectives

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

- Mitigate the off-site migration of project-related, dissolved-phase VOCs. Specifically, the BPGWCS addresses:

  - Groundwater that has total volatile organic compound (TVOC) 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 TVOC 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 the 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.
  - Filtered to remove oxidized metals.
  - Returned to the aquifer, via a discharge pipeline routed to a recharge basin located on the adjacent former Bethpage Navy Weapons Industrial Reserve Plant (NWIRP) 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 that is periodically monitored to assess the environmental effectiveness of the BPGWCS.

The major components of the BPGWCS are:

- 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 rate of 210 gpm.
- One low-profile air stripper to remove VOCs from the extracted groundwater prior to discharge to the recharge basins.
- Two bag filters configured so that one is "operational" and the other is in "stand by" mode. The system control logic automatically switches from the "operational" filter unit to the "stand by" filter unit when the bag filters are full to prevent a system shut down. The spent filters are then replaced and the unit is placed in "stand by" mode.

- Four emission control units (ECUs), two containing vapor phase granular activated carbon (VPGAC) and two containing potassium permanganate-impregnated zeolite (PPZ). The VPGAC ECUs treat the Project VOCs in the air stripper off gas, except for vinyl chloride, which is treated by the PPZ ECUs.

- The Groundwater Monitoring Network consists of 35 monitoring locations, consisting of 17 groundwater monitoring wells, 4 remedial wells, and 14 piezometers.

Additional information is provided in the OM&M Manual (ARCADIS 2009). The layout of the BPGWCS is shown on Figure 2 and a schematic drawing is provided on Figure 3. The groundwater sampling locations that form the Groundwater Monitoring Network are shown on Figure 4. Construction details for the monitoring wells and piezometers are provided in Appendix A.

4. Operation and Maintenance Activities

4.1 Fourth Quarter 2013

The BPGWCS operated continuously during the fourth quarter reporting period with the exception of brief shutdown periods for routine maintenance and alarm conditions. BPGWCS operation and maintenance (O&M) activities conducted during the fourth quarter reporting period are described below and are summarized in Table 1:

- The system operated full-time, 89 out of 92 days (97% uptime).

- Based on the volume of groundwater recovered, the remedial wells operated at quarterly average flow rates of 31 gpm (RW-1), 76 gpm (RW-2), 68 gpm (RW-3) and 31 gpm (RW-4). The slightly diminished average flow rate for Remedial Well RW-3 (i.e., 75 gpm design rate vs. 67 gpm quarterly average flow rate) was due to 137 hours of downtime, resulting from a motor overload/failure condition from November 2-11, 2013.

- The remedial wells operated at reduced flow rates (between 93% to 99% of design) during portions of the fourth quarter reporting period due to iron build-up in the pumps, influent pipelines and valves. The reduced flow rates were corrected by adjusting the manifold globe valve or through the performance of periodic well

maintenance (e.g., remedial well Aqua Gard ™ treatments, pulling and replacing the remedial well pumps, valve cleaning, etc.).

- The system was monitored during the majority of business days, either via a site visit or remotely by wireless computer link-up.

- The Supervisory Control and Data Acquisition (SCADA) system operated as designed, and when conditions warranted (see below), shut the system down automatically and instantaneously, and provided notification of system advisories and alarms to plant operators.

- Intentional system shut downs were as follows (see Table 1 for more information):

  - Remedial Well RW-2 and RW-3 rehabilitation (October 1 to October 2, 2013)

  - Installation of permanent pressure gauges at the cleanouts for Remedial Wells RW-2 and RW-3 (October 4, 2013)

  - Bag filter influent valve maintenance, transient voltage surge suppressor (TVSS) replacement and electric receptacle installation (October 22, 2013)

  - Remedial Well RW-2 pump and motor replacement and Remedial Well RW-3 motor replacement (November 11, 2013)

- System shut downs due to alarm conditions were as follows (see Table 1 for more information):

  - High sump level (October 7, 2013): Problem: Air stripper effluent wye strainer clogged; Solution: The wye strainer was cleaned. The routine OM&M schedule was also modified to include cleaning of the wye strainer on a quarterly basis.

  - Motor overload at Remedial Well RW-3 (November 2, 2013): Problem: Motor failure; Solution: The pump motor was replaced with a new, spare motor.

  - Bag filter fault (November 11 and 12, 2013): Problem: Both bag filters clogged during off-hours before an operator was able to respond to the alarm. Solution: This situation is atypical and the solution is to change out the bag filters and restore normal operations as soon as feasible.

4.2 2013 Annual System Performance and Alarm Summary

The 2013 system operation up-time is provided on Table 1 and summarized below. System shut downs that occurred in 2013 are summarized below, and are described in the three 2013 Quarterly Reports (ARCADIS 2013a, ARCADIS 2013b, and ARCADIS 2013c) and in this report. In general, system operation in 2013 is consistent with operation in previous years.

In 2013:

- The system operated full-time, 354 out of 365 days (97% uptime).
- The remedial wells operated at reduced flow rates (between 93% to 99% of design) 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 valve or through the performance of periodic maintenance (e.g., remedial well Aqua Gard™ treatments, pulling and replacing the remedial well pumps, valve cleaning, etc.). While the periodic maintenance measures did not eliminate the problems associated with iron fouling, they lessened the flow rate impacts and provided a means to manage problematic iron fouling and maintain system uptime.
- There were 35 system shutdowns, of which:
  - Four (4) shutdowns were due to temporary power interruptions or suspected poor local power service.
  - Thirteen (14) shutdowns were for system maintenance (e.g. periodic preventative system maintenance, remedial well maintenance, and required system repairs/upgrade).
  - One (1) shutdown was to prepare for a severe weather event (Winter Storm Nemo). System was shut down prior to the arrival of the storm and was restarted when it was considered safe to do so.
  - Sixteen (16) shutdowns were due to alarm conditions encountered during the normal operation of the system:

- One (1) shutdown was due to the air stripper effluent wye strainer being clogged. As noted above, this problem was corrected by cleaning the wye strainer and adjusting the routine schedule for future cleaning.

- One (1) shutdown was due to an overload and motor failure condition at Remedial Well RW-3. As noted above, this problem was corrected by replacing the motor with a new spare motor. In addition, an assessment of additional motor safeguards will be made to provide an extra level of protection for the remedial well motors.

- Two (2) shutdowns were due to blower high-discharge pressure alarms. This problem was corrected by adjusting the blower VFD speed to acceptable levels to remove the alarm condition

- Five (5) shutdowns were due to issues with the pressure switches for Remedial Wells RW-2 and RW-3 clogging and registering faulty alarms. This problem was corrected by installing new pressure switches at the manifold for Remedial Wells RW-2 and RW-3 and adjusting the routine schedule for future cleaning of the pressure switch ports.

- Seven (7) shutdowns were caused when the second bag filter clogged 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.

For the most part, the system was able to be restarted without incident the same day or the day following an alarm. .

As shown above, the majority of the operational issues were related to either electrical issues at the remedial wells or iron fouling.

5. Treatment System Compliance and Performance Monitoring

5.1 Fourth Quarter 2013 System Monitoring Activities

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

- Three (3) sampling events to collect required water samples and air samples.
- Thirteen (13) weekly site visits to monitor and record key system operational parameters.

The system operation and monitoring results are summarized in the following tables, graphs, and appendices:

- An 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. Complete validated Water Sample Analytical Result Summaries for each sampling event are included in Appendix B.
- Summary of Influent and Effluent Vapor Sample Analytical Results (Tables 4 and 5, respectively). Table 5 also provides the BPGWCS treatment system removal efficiency. Complete, validated Vapor Sample Analytical Results, for each sample event, are included in Appendix C.
- System Parameters including flow rates, line pressures, and temperatures (Table 6).
- Summaries of Groundwater Recovered, VOC Mass Recovered, and VOC Recovery Rates (Table 7). Table 7 provides a breakdown of these parameters by Remedial Well and System and also breaks down the VOC Mass Recovered and VOC Recovery Rates into Project, Non-Project, and Total VOCs.
- Air Discharge Quality Evaluation and Compliance Table (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 2013 System Monitoring Activities

In addition to the fourth quarter system monitoring discussed in Section 5.1 above, the system compliance and performance monitoring activities performed during the previous three quarterly periods are described in the 2013 Quarterly Reports (ARCADIS 2013a, ARCADIS 2013b, and ARCADIS 2013c).

5.3 Summary of OM&M Results and Conclusions

5.3.1 System Operation and Effectiveness

Fourth quarter and annual BPGWCS OM&M results and conclusions are summarized below:

- Total volume of groundwater recovered and treated (Table 7):
  - 4th Quarter 2013: 27 million gallons.
  - 2013 Annual Total: 106 million gallons.
  - Cumulative Total Since System Start Up: 462 million gallons.
- Total VOC mass recovered (Table 7 and Figures 5, 8A, 8B, and 8C):
  - 4th Quarter 2013: 35 pounds (lbs) of VOCs.
  - 2013 Annual Total: 171 lbs of VOCs.
  - Cumulative Total Since System Start Up: 1,968 lbs of VOCs.
- VOC mass recovered and mass removal rates (Table 7 and Figures 8A, 8B, and 8C):

- The majority of VOCs recovered during this fourth quarter reporting period were Project VOCs (71% or 25 lbs). The majority of VOCs recovered during 2013 were Project VOCs (66% or 113 lbs).

- The majority of Project VOCs are recovered by RW-2 (96.3% during the fourth quarter reporting period and 95.8% during 2013) and RW-3 (3.2% during the fourth quarter reporting period and 3.7% during 2013).

- The majority of the Non-Project VOCs are recovered by RW-3 (55% during the fourth quarter reporting period and 65% during 2013) and RW-4 (41% during the fourth quarter reporting period and 32% during 2013).

- Treatment system influent concentrations (Table 2 and Figure 7):

  - Project VOC influent concentrations (ranging from 77 to 92 µg/L) during the fourth quarter reporting period are consistent with the range of values detected throughout 2013, but are well below the peak concentration observed in 2013 (206 µg/L). Additionally, concentrations detected during 2013 are significantly below the peak project concentration of approximately 1,000 µg/L (in July, 2009). Project VOC influent concentrations have generally decreased since 2010.

  - Non-Project VOC influent concentrations (ranging from 30 to 37 µg/L) during the fourth quarter reporting period are consistent with the range of values detected throughout 2013, and are below the peak concentration observed in 2013 (86 µg/L). Additionally, concentrations detected during 2013 are significantly below the peak project concentration of 650 µg/L (May, 2010). Non-Project VOC influent concentrations have generally decreased since 2010,

  - Mercury has not been detected in an influent sample since system start-up.

- With the exception of cis-1,2-dichloroethene, which was detected at a concentration of 6.1 ug/L in Remedial Well RW-3 (Table 9), concentrations of individual Project VOCs in Remedial Wells RW-1, RW-3 and RW-4 for the fourth quarter reporting period were not detected above applicable standards, criteria, and guidance values (SCGs). Similar to the total influent concentrations, Project VOC remedial well concentrations have generally decreased since 2010.

- Metals concentrations in all four remedial wells in 2013 were consistent with concentrations in previous years, including infrequent anomalous iron concentrations in Remedial Well RW-2 (in March, July and November, 2013). These anomalous concentrations are believed to be attributed to the iron precipitate that coats the well and pipeline, specifically, small pieces of the iron precipitate can break off and become entrained in the influent groundwater (Table 10).

- The air stripper, air stripper off-gas treatment system, and bag filter system performed within acceptable operating ranges for this reporting period and for 2013, as indicated by:

  - The air stripper VOC removal efficiency was greater than 99.9 percent for Project and Non-Project VOCs (Table 3).

  - Both the water and air discharges comply with applicable SCGs and discharge limits (Tables 3, 5, and 8).

5.3.2 Regulatory Status of Discharges

5.3.2.1 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 2010]) (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 USEPA SCREEN3 Model in conjunction with the NYSDEC DAR-1 AGCs. A scaling factor was calculated using the SCREEN3 model with site-specific physical layout information (e.g. building dimensions, stack height, terrain, etc.) and operating data (e.g. air flow rate, temperature, etc.) inputs for each monitoring event. The scaling factor was then used to adjust (scale) the NYSDEC DAR-1 AGC to a site-specific MASC. A summary of the instantaneous percent (i.e., not time- weighted) of the site-specific annual MASC for Project VOCs, Freon 12, and Freon 22 is provided in Table 8. A summary of the cumulative annual percent (i.e., time-weighted) of the site-specific MASC for detected compounds is also provided in Table 8. A summary of the model inputs, outputs, and backup calculations is provided in Appendix D.

The BPGWCS air effluent met NYSDEC requirements throughout the fourth quarter reporting period and 2013, 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 their applicable, instantaneous MASCs, as calculated using the USEPA SCREEN 3 Model (Table 8). Similarly, the time-weighted rolling averages for the individual Project VOCS, Freon 12, and Freon 22 are below their respective MASCs.

5.3.2.2 Water Discharge

The BPGWCS treated water effluent met NYSDEC regulatory requirements during the fourth quarter reporting period and during 2013 (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 SPDES equivalency permit.

- The measured concentration of total iron and total mercury in the treated water effluent were below applicable discharge limits, per the interim SPDES equivalency permit. In addition, total mercury continues to be non-detect and has not been detected in any treated water effluent samples since systems start-up.

6. Environmental Effectiveness Monitoring

BPGWCS treatment system environmental effectiveness (i.e., hydraulic monitoring and groundwater quality monitoring) activities and results for this reporting period and for 2013 are discussed below.

6.1 Hydraulic Monitoring

6.1.1 Activities

In accordance with the OM&M Manual requirements and methodologies (ARCADIS 2009), a quarterly round of groundwater hydraulic monitoring was performed during the fourth quarter reporting period. Specifically, depth-to-water measurements were collected on November 1, 2013 from the 33 locations forming the approved monitoring well network (Table 11 and Figure 4). Water-level data collected were mapped and vertical hydraulic gradients were calculated as part of the evaluation of the hydraulic performance of the BPGWCS (Table 12).

6.1.2 Results

Figure 4 provides the configuration of the shallow potentiometric surface and the inferred horizontal groundwater flow directions on November 1, 2013 at the Site Area. Comparing fourth quarter water-level elevations from 2013 to those from 2012 reveal that the water table was approximately one-foot lower at the time water level elevations were recorded in 2013 as compared to 2012.

An evaluation of vertical hydraulic gradients was also conducted. The vertical hydraulic gradient is a measure of the potential for vertical groundwater flow between two vertically separated, closely spaced observation points (i.e., clustered or nested observation wells). The magnitude of the gradient indicates the steepness of the gradient, and the sign of the gradient indicates the direction of vertical flow (i.e., a positive vertical gradient indicates upward flow, while a negative vertical gradient indicates downward groundwater flow). The gradient does not provide information with respect to the rate of groundwater movement, which is affected by the hydraulic conductivity of the aquifer material through which the water is moving.

Table 12 provides a summary of calculated vertical groundwater hydraulic gradients at key well pairs located along the Site Area southern boundary during the November 1, 2013 hydraulic groundwater monitoring event. The vertical hydraulic gradients generally indicate that shallow groundwater is moving downward and deeper groundwater is being drawn upward towards the remedial well screened intervals.

Figure 9 provides a cross-sectional view of vertical groundwater flow (based on groundwater levels measured on November 1, 2013), combined with a cross section of Project VOC concentrations in groundwater above 5 µg /L (based on results from May-

June 2013 groundwater sampling round). Figure 9 indicates groundwater containing Project VOCs above 5 µg/L is being drawn toward the remedial well screens of RW-1 through RW-4, which is consistent with the vertical groundwater hydraulic gradient observations.

Figure 9 in combination with Figure 4 indicate that the BPGWCS provides effective vertical and horizontal hydraulic control of groundwater containing Project VOC concentrations above 5 µg /L; therefore, the BPGWCS satisfies its remedial action objective.

The hydraulic monitoring results for the three prior 2013 quarterly reporting periods are provided in their respective 2013 Quarterly Reports (ARCADIS 2013a, ARCADIS 2013b, and ARCADIS 2013c). Results from these earlier 2013 reporting periods are consistent with the fourth quarter reporting period and show that the BPGWCS has been intercepting the Project VOC-impacted groundwater with concentrations greater than 5 µg/L and preventing its off-site migration throughout 2013.

6.2 Groundwater Quality Monitoring

6.2.1 Activities

An annual groundwater sampling round was performed in May-June as part of a site-wide sampling activity. Monitoring wells included in the OU3 OM&M Manual (ARCADIS 2009) were sampled. Groundwater samples were collected from 17 monitoring wells and analyzed for the Target Compound List (TCL) VOCs, plus Freon 12 and Freon 22, using NYSDEC Analytical Services Protocol (ASP) 2005 Method OLM4.3 and total and dissolved metals (cadmium and chromium) using USEPA Method 6010.

6.2.2 Results

Table 13 summarizes the results of laboratory analysis for VOCs in groundwater samples collected from monitoring wells associated with the BPGWCS. The table includes the results of samples collected during the fourth quarter reporting period and previous reporting periods. In general, when the 2013 groundwater sampling results are compared to the results from years (2009 to 2012), monitoring wells located south of the remedial wells, (MW-200 series wells located within the capture zone of the remedial wells, as shown on Figure 4), show stable or decreasing VOC concentrations. The exceptions to this observation were MW-202-1 and MW-203-1, where VOCs increased slightly in 2013. However, the concentrations of individual Project VOCs

were all less than their applicable SCGs. The NYSDEC-approved Bethpage Park Containment System Pre-Design Hydraulic Effectiveness Evaluation Work Plan (ARCADIS 2014) has been prepared and submitted to NYSDEC to provide additional groundwater quality and water-level information to confirm the understanding that the current IRM system is effectively controlling off-site migration of site-related VOCs in groundwater beneath and between the remedial wells. The increasing trend of VOC concentrations observed at monitoring well MW-202-1 and MW-203-1 will be further evaluated during implementation of the work plan. .

Table 14 summarizes the results of laboratory analysis of metals in groundwater samples collected from monitoring wells associated with the BPGWCS. The 2013 groundwater sampling results indicate no detections of total or dissolved cadmium. Chromium concentrations in monitoring wells located upgradient (north) of the remedial wells are consistent with concentrations seen during previous sampling events, with concentrations of total and dissolved chromium below NYSDEC SCGs.

6.3 Environmental Effectiveness Monitoring Conclusions

Collectively, Figures 4 and 9 indicate that the BPGWCS Containment system is operating as designed, that the expected associated capture zone has developed, and that off-site migration of groundwater containing Project VOC concentrations greater than 5 µg/L is being prevented.

7. Recommendations

- Remove mercury from the SPDES equivalency monitoring program because mercury has not been detected in any system effluent water samples analyzed for mercury.

- Continue operating, maintaining, and monitoring the system in accordance with the OM&M Manual (ARCADIS 2009) including the current quarterly preventive maintenance program performed at Remedial Wells RW-2 and RW-3 to remove iron build-up in the wells and pipelines.

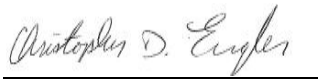
- Implement the NYSDEC-approved Bethpage Park Containment System Pre-Design Hydraulic Effectiveness Evaluation Work Plan (ARCADIS 2014) to provide additional groundwater quality and water-level information to confirm the understanding that the system is effectively controlling off-site migration of site-related VOCs in groundwater beneath and between the remedial wells.

- Based on the consistent operation of the BPGWCS since July 2009, the current, quarterly reporting frequency should be reduced to annual. Consistent with the NYSDEC-approved OU3 Groundwater IRM OM&M Manual (ARCADIS 2009), an annual report will be prepared to summarize system operation, performance, and monitoring data; this annual report will be prepared and submitted under the supervision of a licensed, professional engineer. Additionally, pertinent data collected for the BPGWCS will be submitted to the NYSDEC as part of the semi-annual progress reports currently completed in accordance with Section III of AOC Index #W1-0018-04-01. Upon receipt of NYSDEC approval of this recommendation, the OU3 Groundwater IRM OM&M Manual (ARCADIS 2009) will be updated to reflect this change.

8. Certification

Statement of Certification

On behalf of Northrop Grumman Systems Corporation, I hereby certify and attest that the Operable Unit 3 Bethpage Park Groundwater Containment System is operated in compliance with the remedial action objectives provided within the NYSDEC-approved Groundwater Interim Remedial Measure Work Plan dated December 2007, which was prepared pursuant to NYSDEC Order on Consent Index # W1-0018-04-01 referencing the Former Grumman Settling Ponds Site and dated July 4, 2005.



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Tables

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

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
Jan-13					b		####			b					b				b			b				b			b			31
Feb-13	b		#####/*/**b				b	(2)		b		b		(3)b			b			b			b			b	(4)					25
Mar-13	b	bb	(4)bbb	#### b	(5)	b		b	(5)		b		b	(5,6)'b	(5)		b					b					b	(5)				30
Q1 2013																																86
Apr-13	#####/*/**b					b			(7)	b								b				b			(8)b			b				30
May-13	b			b		####	b			(9) b	b		(10) b	b		b	(11)	b	b	(12) b	b	(13) b		(14) b	b	b	b		b	(15) b	b	29
Jun-13	b		(16)	b		####	b			(17) b		b			b	(18)		b					b				b					30
Q2 2013																																89
Jul-13	#####/*/**b					bb			b				b			b	(19)	b				b		(20) bbbb	(21) b					b		29
Aug-13			b		####		b		b			b				b			b			b		b				b			b	31
Sep-13		#####(22) bb		b				b		b			b				b			b			b		b	b				b		30
Q3 2013																																90
Oct-13	(23)bb			(24)	b		(25)#/##		b					b					b			(26)bb				bb	b					29
Nov-13	b	(27)b						b			(28)bbbb	(29)b	#####/*/**b				b	bb			b			b					b			29
Dec-13				b					#/##b					b					b				b			b					b	31
Q4 2013																																89
2013 Total																																354
TOTAL																																**1,570**

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:

IRM	Interim Remedial Measure.
BF	Bag Filter

Notes:

(1) Days in which the system was operational for the majority of the day are counted as one day.

1st Quarter 2013

(2) The system was intentionally shut down at ~4:15 PM on February 8, 2013 in anticipation of Winter Storm Nemo. The system was restarted at ~ 11AM on February 10, 2013 after the storm had passed and the system had been inspected for potential damage.

(3) The system shut down at 2:36 AM on February 14, 2013 due to both 401 BF & 402 BF fouling over a shorter than expected time frame, resulting in high-high pressure alarm and system shutdown. The system was restarted later that morning and was off-line for approximately 9.5 hours.

(4) The system was shut down at 9:05 AM on February 27, 2013 for preventative maintenance activities at Remedial Wells RW-2 and RW-3. In addition to the rehabilitation program, the RW-2 pump was pulled, replaced with a spare pump, and subsequently cleaned for future use. Upon initial restart, the system shut down due a low pressure alarm caused by a plugged secondary, fail-safe (SFSI) pressure switch. The switch was cleaned and system was restarted at ~ 3PM on March 1, 2013. The system was down for approximately 77 hours. Over the next two days (March 2 & 3, 2013) multiple bag filter switchovers occurred and at one point the system was off-line for approximately 5.5 hours because two switchovers occurred in rapid succession.

(5) Between March 5 and March 28, the system shut down five (5) times due to problems associated with the RW-2 and RW-3 SFSI pressure switches, specifically:

a) The system shut down at 10:34 AM on March 5, 2013 due to a low-pressure alarm. System was checked and restarted that afternoon, and was off-line for approximately 2.5 hours.

b) The system shut down at 1:43 PM on March 9, 2013 due to a low-pressure alarm. The RW-2 and RW-3 switches were manually cleaned, and system was restarted the next morning, with RW-3 running at a reduced flow rate of 65 gpm. The system was off-line for approximately 21 hours.

c) The system could not be restarted after the air stripper cleaning on March 14, 2013 (see Note 6) due to pressure switch issues. The problematic RW-3 pressure switch was switched with the RW-4 pressure switch, and the system was restarted.

d) The system shut down at 11:54 AM on March 15, 2013 due to a low-pressure alarm from the failing RW-4 SFSI pressure switch. The primary RW-4 pressure switch was tested was working correctly. The problematic, secondary/redundant switch (the SFSI switch) was taken off-line. The system was restarted that afternoon and was off-line for approximately 3.25 hours. [Problematic SFSI switches were replaced on May 13, 2013, See Note 10]

e) The system shut down at 12:26 PM March 28, 2013 due to a problematic SFSI switch. The system was restarted later that afternoon and was off-line for approximately 2 hours.

(6) The system was shut down at 10:32 AM on March 14, 2013 for a periodic air stripper cleaning using a pressure washer. After the air stripper cleaning, there was a problem restarting the system (see Note 5c). The system was restarted that afternoon and was off-line for approximately 6 hours.

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

Notes continued:

2nd Quarter 2013

(7) The system shut down at 3:36 PM on April 9, 2013 due to blower discharge high-pressure alarm. The air flow rate was temporarily reduced and the system was restarted later that afternoon and was off-line for approximately 0.8 hours.

(8) The system shut down twice on April 25, 2013, at 11:38 AM and 1:55 pm, due to temporary power supply interruptions. The system was restarted at 12:08 PM and 2:11 PM, respectively, after the system was inspected for any problems. The system was off-line for a total of approximately 1 hour.

(9) The system was shut down at 9:25 AM on May 10, 2013 to remove iron precipitate build-up in the RW-2 and RW-3 valves located in the treatment building. The system was restarted that afternoon and was off-line for approximately 7 hours.

(10) The problematic SFSI pressure switches (see Note 5 above) were replaced on May 13, 2013.

(11) The system shut down at 7:43 PM on May 17, 2013 due to a temporary power supply interruption. The system was restarted the next morning after the system was inspected for any problems. The system was off-line for approximately 12 hours.

(12) The system was run with Remedial Well RW-2 off-line from 8:21 AM to 1:30 PM and from 3:11 PM to 5:32 PM on May 20, 2013 for a pipeline inspection. The system was operated at a reduced flow rate for approximately 6.5 hours.

(13) The system was shut down at 08:11 AM on May 22, 2013 for preventative maintenance activities at Remedial Wells RW-2 and RW-3. In addition to the normal rehabilitation work, the RW-2 and RW-3 pumps were pulled and replaced with spare pumps and motors. The system was restarted the next day and was off-line for approximately 29 hours. Multiple bag filter switches occurred during the start up of the system.

(14) The system shut down at 2:21 AM on May 24, 2013 as a result of rapid succession of bag filter changes overnight. The system was restarted the next morning and was off-line for approximately 8 hours.

(15) The system was shut down at 7:40 AM on May 30, 2013 for vapor phase granular activated carbon and potassium permanganate change-outs. The system was initially restarted at 4:46 PM that afternoon but the system shut down at 6:01 PM due to blower high discharge pressure. The blower's VFD settings were changed and the system was restarted at 7:13 PM. The system was off-line for approximately 10 hours.

(16) The system was shut down at 1:07 PM on June 3, 2013 for a periodic air stripper cleaning using a pressure washer. The system was restarted at 6:46 PM and was off-line for approximately 5.8 hours.

(17) The system was shut down at 2:30 PM on June 10, 2013 for a periodic air stripper cleaning using a pressure washer. The system was restarted at 6:53 PM and was off-line for approximately 4.5 hours.

(18) The system shut down at 3:21 AM on June 16, 2013 due to a temporary power supply interruption. The system was restarted at 10:06 AM after the system was inspected for any problems. The system was off-line for approximately 5.6 hours.

3rd Quarter 2013

(19) The system was shut down at 8:01 AM on July 17, 2013 for preventative maintenance of Blower B-410. The work consisted of the removal of B-410 and cleaning and replacement of the bearings. The system was restarted at 5:23 PM on July 17, 2013 and was off-line for approximately 9.5 hours.

(20) The system was shut down at 7:43 AM on July 24, 2013 for preventative maintenance activities at Remedial Wells RW-2 and RW-3. In addition to the normal rehabilitation work, the RW-2 pipeline was cleaned and the RW-2 pump and motor was pulled and replaced with spares. The system was left off-line overnight and was restarted at 7:39 PM on July 25, 2013. The system was off-line for approximately 36 hours.

(21) The system shut down at 3:27 AM on July 26, 2013 due to multiple bag filter switches. The system was restarted at 10:10 AM on July 26, 2013 and was off-line for approximately 6.8 hours.

(22) The system shut down at 8:08 AM on September 3, 2013 as a result of multiple bag filter changes overnight. The system was restarted at 12:57 PM on September 3, 2013 and was off-line for approximately 4.5 hours.

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

Notes continued:

4th Quarter 2013

(23) The system was shut down at 8:12 AM on October 1, 2013 for preventative maintenance activities at Remedial Wells RW-2 and RW-3. The system was left off-line overnight and was restarted at 2:12 PM on October 2, 2013. The system was off-line for approximately 30 hours.
(24) The system was shut down at 3:07 PM on October 4, 2013 to permanently install back mounted pressure gauges at wells RW-2 and RW-3. The system was restarted at 4:17 PM and was off-line for approximately 1.2 hours.
(25) The system shut down at 3:58 PM on October 7, 2013 due to a clogged wye strainer at the air stripper effluent. The system was restarted at 8:28 PM and was off-line for approximately 4.5 hours.
(26) The system was shutdown at 8:10 AM on October 22, 2013 for maintenance. The work consisted of the installation of electric equipment and cleaning the bag filter influent valves. The system was restarted at 3:47 PM and was off-line for approximately 7.8 hours.
(27) The system shut down at 12:44 PM on November 2, 2013 due to a malfunction with remedial well RW-3. It was determined that the RW-3 motor was no longer functioning and would be replaced. The system was restarted at 2:59 PM with RW-3 off-line. The system was off-line for approximately 2 hours.
(28) The system shut down at 1:19 AM on November 11, 2013 due to multiple bag filter switches. The system was left off-line for the replacement of pumps and motors at remedial wells RW-2 and RW-3 on November 11, 2013. The system was restarted at 1:59 PM and was off-line for approximately 12.5 hours.
(29) The system shut down at 5:53 AM on November 12, 2013 due to multiple bag filter switches. The system was restarted at 9:50 AM and was off-line for approximately 4 hours.

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Table 2. Summary of Influent Water Sample Analytical Results, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1]

Compound [2]	01/07/13 (µg/L)	02/04/13 (µg/L)	03/04/13 (µg/L)	04/01/13 (µg/L)	05/06/13 (µg/L)	06/06/13 (µg/L)	07/01/13 (µg/L)	08/05/13 (µg/L)	09/03/13 (µg/L)	10/07/13 (µg/L)	11/14/13 (µg/L)	12/09/13 (µg/L)
Project VOCs												
1,1,1 - Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1 - Dichloroethane	0.48	0.42	0.71	0.59	0.50	0.51	0.46	0.41	0.41	0.41	0.45	0.30
1,2 - Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1 - Dichloroethene	0.25	ND	0.44	0.29	0.22	0.23	0.24	0.23	0.20	ND	ND	0.20
Tetrachloroethene	0.34	0.30	0.34	0.44	0.29	0.35	0.35	0.27	0.33	0.34	0.35	0.34
Trichloroethene	**5.9**	**5.4**	**7.3**	**5.4**	**5.1**	**5.6**	**5.3**	**5.7**	4.8	**5.3**	4.8	4.2
Vinyl Chloride	**16**	**17**	**52**	**27**	**25**	**27**	**22**	**25**	**22**	**29**	**23**	**21**
cis 1,2-Dichloroethene	**38**	**40**	**80**	**51**	**45**	**45**	**31**	**33**	**30**	**30**	**26**	**26**
trans 1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	**17**	**13**	**59**	**28**	**25**	**39**	**22**	**20**	**21**	**24**	**22**	**22**
Xylenes	1.8	1.6	6.1	2.9	2.7	3.1	1.7	2.1	2.3	2.9	2.5	2.5
Subtotal Project VOCs	**80**	**78**	**206**	**116**	**104**	**121**	**83**	**87**	**81**	**92**	**79**	**77**
Non-Project VOCs												
Dichlorodifluoromethane (Freon 12)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodifluoromethane (Freon 22)	**86**	**85**	**64**	**55**	**48**	**40**	**44**	**41**	**35**	**35**	**30**	**37**
Subtotal Non-Project VOCs	**86**	**85**	**64**	**55**	**48**	**40**	**44**	**41**	**35**	**35**	**30**	**37**
Total VOCs [3]	**166**	**163**	**270**	**171**	**152**	**161**	**127**	**128**	**116**	**127**	**109**	**114**
Inorganics												
Total Iron	**370**	**510**	**370**	**310**	**750**	**1,010**	**520**	**1030**	**350**	**710**	**570**	**240**
Total Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA
pH [4]	5.9	5.7	5.4[5]	5.6	5.5	5.6	5.6	6.6	5.4	5.4	5.5	5.3

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. (1)

Notes:

(1) Water samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3, for iron analyses per USEPA Method 6010C and for mercury analyses per USEPA Method 7470A. The VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Influent water samples were collected from Water Sampling Port-5 (WSP-5); refer to Figure 3 of this OM&M Report for the schematic location of WSP-5. Data in this table corresponds to approximately the past year of system operation.

(2) 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.

(3) "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.

(4) 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.

(5) The March 2013 pH influent data was compromised, so an estimated value based on the average of available pH values (from Remedial Wells RW-2 and RW-3) is provided.

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.
IRM	Interim remedial measure.
NA	Not analyzed.
ND	Analyte not detected at, or above its laboratory quantification limit.
NYSDEC	New York State Department of Environmental Conservation.
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.

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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]

Compound [2]	Discharge Limit [3] (µg/L)	01/07/13 (µg/L)	02/04/13 (µg/L)	03/04/13 (µg/L)	04/01/13 (µg/L)	05/06/13 (µg/L)	06/06/13 (µg/L)	07/01/13 (µg/L)	08/06/13 (µg/L)	09/03/13 (µg/L)	10/07/13 (µg/L)	11/14/13 (µg/L)	12/09/13 (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**	**0.0**	**0.0**	**0.0**
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**			
Total VOCs [4]	--	**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 [5]	--	> 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	**140**	**370**	**560**	**270**	**270**	**310**	**220**	**390**	**350**	**540**	**360**	**270**
Total Mercury	250	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
pH [6]	5.5 - 8.5	6.7	7.5	6.7	6.9	6.3	6.4	5.9	5.7	6.7	6.8	6.5	6.6

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)

Notes:

(1) Water samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses per NYSDEC ASP 2005, Method OLM 4.3, for iron analyses per USEPA Method 6010C and for mercury analyses per USEPA Method 7470A. The VOC analyte list is provided in the DRAFT Groundwater IRM OM&M Manual (ARCADIS 2009). Effluent water samples were collected from Water Sampling Port-7 (WSP-7); refer to Figure 3 of this OM&M Report for the location of WSP-7. Data in this table corresponds to approximately the past year of system operation.

(2) 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.

(3) 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.

(4) "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.

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

(6) 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:

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.
IRM	Interim remedial measure.
ND	Analyte not detected at, or above its laboratory quantification limit.
NYSDEC	New York State Department of Environmental Conservation.
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 applicable.
>	Greater than.

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]

Compound [2]	12/03/12 (µg/m^3)	02/04/13 (µg/m^3)	4/1/2013 [4] (µg/m^3)	7/1/2013 (µg/m^3)	11/14/2013 (µg/m^3)
Project VOCs					
1,1,1 - Trichloroethane	**2.4**	ND	2.2	ND	**1.0**
1,1 - Dichloroethane	**11**	**6.2**	8.6	**6.8**	**5.4**
1,2 - Dichloroethane	ND	ND	0.67	ND	ND
1,1 - Dichloroethene	**4.6**	ND	3.9	**3.2**	**2.0**
Tetrachloroethene	**5.9**	ND	4.7	**4.3**	**3.6**
Trichloroethene	**110**	**63**	97	**78**	**66**
Vinyl Chloride	**310**	**210**	340	**290**	**320**
cis 1,2-Dichloroethene	**1,000**	**560**	880	**570**	**470**
trans 1,2-Dichloroethene	**1.3**	ND	0.87	ND	ND
Benzene	**4.8**	ND	1.3	ND	**1.9**
Toluene	**420**	**46**	510	**380**	**370**
Xylenes	**48**	ND	58	**41**	**41**
Subtotal Project VOCs	**1,918**	**885**	**1,907**	**1,373**	**1,281**
Non-Project VOCs					
Dichlorodifluoromethane (Freon 12)	**3.6**	ND	2.7	**2.6**	**2.4**
Chlorodifluoromethane (Freon 22)	**1,100**	**730**	560	**540**	**400**
Subtotal Non-Project VOCs	**1,104**	**730**	**563**	**543**	**402**
Total VOCs [3]	**3,022**	**1,615**	**2,470**	**1,916**	**1,683**

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 ALS Environmental for VOC analyses per Modified USEPA Method T0-15. 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. Data in this table corresponds to approximately the past year of system operation.

(2) Only VOCs that are associated with the interim State Pollutant Discharge Elimination System (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.

(4) The data for the April 2013 influent sample is "estimated" because the summa cannister's vacuum was lower than laboratory protocols allow for proper quantification.

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.
IRM Interim remedial measure.
ND Analyte not detected at or above its laboratory reporting limit.
OM&M Operation, maintenance, and monitoring.
TICs Tentatively identified compounds.
USEPA United States Environmental Protection Agency.
VOC Volatile organic compound.
$\mu g/m^3$ Micrograms per cubic meter.

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

Compound (2)	Discharge Limit (3) (µg/m^3)	12/03/12 (µg/m^3)	02/04/13 (µg/m^3)	04/01/13 (µg/m^3)	7/1/2013 (µg/m^3)	11/14/2013 (µg/m^3)
Project VOCs						
1,1,1 - Trichloroethane	9,000	ND	ND	ND	ND	ND
1,1 - Dichloroethane	NS	**1.8**	**1.8**	**4.1**	**1.6**	**1.4**
1,2 - Dichloroethane	NS	ND	ND	ND	ND	ND
1,1 - Dichloroethene	380 (4)	**1.0**	**3.3**	**5.3**	ND	ND
Tetrachloroethene	1,000	ND	ND	ND	ND	ND
Trichloroethene	14,000	**4.3**	**4.6**	**3.8**	**2**	ND
Vinyl Chloride	180,000	**23**	**57**	**42**	**50**	**2.6**
cis 1,2-Dichloroethene	190,000 (5)	**25**	**46**	**43**	**25**	**4.6**
trans 1,2-Dichloroethene	NS	ND	ND	ND	ND	ND
Benzene	1,300	**1.9**	**1.1**	**2.3**	**1.7**	**0.91**
Toluene	37,000	**38**	**20**	**49**	**20**	**19**
Xylenes	4,300	**4.3**	**2.6**	**4.4**	ND	ND
Subtotal Project VOCs	NA	**99**	**136**	**154**	**100**	**29**
Non-Project VOCs						
Dichlorodifluoromethane (Freon 12)	NS	**3.5**	**2.6**	**2.8**	**2.7**	**2.5**
Chlorodifluoromethane (Freon 22)	NS	**1,100**	**820**	**560**	**520**	**400**
Subtotal Non-Project VOCs	NA	**1,104**	**823**	**563**	**523**	**403**
Total VOCs (6)	NA	**1,203**	**959**	**717**	**623**	**431**
Treatment Efficiency (Total VOCs) (7)	NA	**60.2%**	**40.6%**	**71.0%**	**67.5%**	**74.4%**
Treatment Efficiency (Project VOCs) (8)	NA	**94.8%**	**84.6%**	**91.9%**	**92.7%**	**97.8%**

See notes on last page.

Table 5. Summary of Effluent 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 ALS Environmental for VOC analyses per Modified USEPA Method T0-15. 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. Data in this tables corresponds to approximately the past year of system operation.

(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 short-term guidance concentration (SGC) per the NYSDEC DAR-1 AGC/SGC tables revised October 18, 2010.

(4) An SGC was not provided in the DAR-1 AGC/SGC Tables, dated October 18, 2010. 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. Specifically for 1,1- dichloroethene, which is not defined as provided in Section IV.A.2.b.1 a high-toxicity compound, the 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. An interim SGC was developed for this compound because it has a moderate toxicity rating, as specified in the DAR-1 AGC/SGC Tables, dated October 18, 2010.

(5) An SGC was not provided in the DAR-1 AGC/SGC Tables, dated October 18, 2010. 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. Specifically for cis-1,2 dichloroethene, which is not defined as a high-toxicity compound, the 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. An interim SGC was developed for this compound because it has a moderate toxicity rating, as specified in the DAR-1 AGC/SGC Tables, dated October 18, 2010.

(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.
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 revised September 10, 2007. An interim SGC was not developed for these compounds because they have low toxicity ratings in the NYSDEC DAR-1 AGC/SGC tables revised October 18, 2010.
NYSDEC New York State Department of Environmental Conservation.
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/m^3 Micrograms per cubic meter.

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

Date [1]	Water Flow Rates [2], [4]						Water Pressures [2], [4]					Air Flow Rate [2], [4]	Air Pressures [2]					Air Temp. [2]
	Remedial Well				Combined Influent	Effluent	Remedial Well Effluent [3]				Effluent	Effluent	ECU Influents				Effluent	Stack Temp.
	RW-1 (gpm)	RW-2 (gpm)	RW-3 (gpm)	RW-4 (gpm)	(gpm)	(gpm)	RW-1 (psi)	RW-2 (psi)	RW-3 (psi)	RW-4 (psi)	(psi)	(scfm)	GAC-501 (iwc)	GAC-502 (iwc)	PPZ-601 (iwc)	PPZ-602 (iwc)	(iwc)	(^{o}R)
01/07/13[4]	31.2	66.4	75.4	31.8	206	215	57	24	37	56	10	1,934	6.5	2.5	1.0	1.8	0.0	516
02/04/13	31.3	62.6	73.1	30.8	198	204	57	26	34	57	7	1,885	7.0	2.5	0.5	1.5	0.0	525
03/04/13	31.7	77.8	72.7	31.3	214	231	57	28	25	56	8	1,900	6.5	2.5	0.5	1.5	0.0	529
04/01/13	32.3	70.2	65.7	32.4	200	205	57	37	37	56	7.5	1,899	7	2.25	0.0	1.5	0.0	528
05/06/13	31.7	66.1	60.8	32.3	191	190	57	33	33	56	7[5]	1,864	6.6	2.5	0.9	2.0	0.0	536
06/06/13	31.4	76.9	78.6	30.9	218	221	57	27	51	57	8	1,811	4.4	5.0	1.7	0.5	0.0	530
07/01/13	31.2	74.9	82.6	31.3	220	229	58	20	37	57	9	2,003	5.5	6.5	2.0	1.0	0.0	534
08/05/13	33.6	82.5	81.2	31.6	229	248	56	24	38	57	9	2,029	9.0	10.0	6.5	5.0	0.0	532
09/03/13	31.3	78.4	79.4	31.3	220	250	58	22	37	57	10	1,998	9.0	10.0	6.0	4.5	0.0	540
10/07/13	34.0	75.0	78.5	31.8	220	246	55	20	37	56	9	1,868	8.4	9.0	5.5	4.5	0.0	536
11/14/13	30.4	81.2	76.5	30.3	218	259	57	26	42	57	8.5[6]	1,970	8.5[6]	9.5[6]	6.0[6]	4.5[6]	0.0[6]	530[6]
12/09/13	30.8	78.0	77.0	30.3	216	251	57	24	40	57	9	1,941	8.5	9.5	5.5	4.5	0.0	530

See notes on last page.

Table 6. Summary of System Parameters, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman 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 corresponds to approximately the past year of system operation.
(2) Instantaneous values from field-mounted instruments, except for the combined influent water-flow rate, which is the sum of individual well flow rates via the Supervisory Control and Data Acquisition (SCADA) System.
(3) Remedial Well effluent pressure readings measured at the influent manifold within the treatment system building.
(4) Starting with January's 2013 site visit the following instantaneous parameters are obtained from the SCADA HMI: Water Flow Rate, Water Pressure, Air Flow Rate.
(5) System effluent pressure not recorded on day of sampling, the average of the next two site visits in May were used.
(6) Values collected on November 11, 2013 during weekly site visit. No values collected on day of sampling.

Acronyms\Key:

ECU	Emission control unit.
gpm	Gallons per minute.
iwc	Inches of water column.
psi	Pounds per square inch.
^{o}R	Degrees Rankine.
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.

Operating Period [1]	Volume of Groundwater Recovered (x1,000 gal) [2]					VOC Mass Recovered (lbs) [3]														VOC Mass Recovery Rate (lbs/day) [4]													
						Total VOCs [5]					Project VOCs [6]					Non-Project VOCs [7]					Total VOCs [5]					Project VOCs [6]					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 Start Up 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																																		
07/21/09 - 12/30/09	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	1.9	0.34	0.089	2.2	<0.01	1.9	0.12	<0.01	1.9	<0.01	<0.01	0.22	0.082	0.30
2010 Totals																																		
12/30/09 - 01/05/11	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																																		
01/05/11 - 01/09/12	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																																		
01/09/12 - 01/07/13	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
January 2013 through March 2013 Totals																																		
01/07/13 - 02/04/13 [9]	1,265	2,566	2,964	1,283	8,078	0.013	7.5	5.3	2.1	15	0.013	7.4	0.44	0.029	7.9	<0.01	0.10	4.8	2.0	6.9	<0.01	0.27	0.19	0.075	0.54	<0.01	0.26	0.016	<0.01	0.28	<0.01	<0.01	0.17	0.071	0.25
02/04/13 - 03/04/13	1,080	2,198	2,443	1,080	6,801	0.011	6.4	4.3	1.7	12	0.011	6.4	0.36	0.024	6.8	<0.01	0.087	4.0	1.7	5.8	<0.01	0.23	0.15	0.061	0.43	<0.01	0.23	0.013	<0.01	0.24	<0.01	<0.01	0.14	0.061	0.21
03/04/13 - 04/01/13	1,235	2,890	2,666	1,233	8,024	0.012	8.5	4.7	2.0	15	0.012	8.3	0.40	0.028	8.7	<0.01	0.11	4.3	2.0	6.4	<0.01	0.30	0.17	0.071	0.54	<0.01	0.30	0.014	<0.01	0.31	<0.01	<0.01	0.15	0.071	0.23
Subtotal Jan - Mar 2013 [10]	3,580	7,654	8,073	3,596	22,903	0.036	22	14	5.8	42	0.036	22	1.2	0.081	23	<0.01	0.30	13	5.7	19	<0.01	0.26	0.17	0.069	0.50	<0.01	0.26	0.014	<0.01	0.27	<0.01	<0.01	0.16	0.068	0.23
April 2013 through June 2013 Totals																																		
04/01/13 - 05/06/13	1,609	3,321	3,162	1,609	9,701	0.015	12	3.9	1.9	18	0.015	12	0.37	0.041	12	<0.01	0.16	3.5	1.9	5.6	<0.01	0.34	0.11	0.054	0.51	<0.01	0.34	0.011	<0.01	0.34	<0.01	<0.01	0.10	0.054	0.16
05/06/13 - 06/06/13	1,271	2,903	2,761	1,271	8,206	0.012	10	3.4	1.5	15	0.012	10	0.33	0.033	10	<0.01	0.14	3.1	1.5	4.7	<0.01	0.32	0.11	0.048	0.48	<0.01	0.32	0.011	<0.01	0.32	<0.01	<0.01	0.10	0.048	0.15
06/06/13 - 07/01/13	1,128	2,846	2,964	1,139	8,077	0.010	10	3.6	1.4	15	0.010	10	0.35	0.029	10	<0.01	0.14	3.3	1.3	4.7	<0.01	0.40	0.14	0.056	0.60	<0.01	0.40	0.014	<0.01	0.40	<0.01	0.01	0.13	0.052	0.19
Subtotal Apr - Jun 2013 [11]	4,008	9,070	8,887	4,019	25,984	0.037	32	11	4.8	48	0.037	32	1.1	0.10	32	<0.01	0.44	9.9	4.7	15	<0.01	0.35	0.12	0.053	0.53	<0.01	0.35	0.012	<0.01	0.35	<0.01	<0.01	0.11	0.052	0.16
July 2013 through September 2013 Totals																																		
07/01/13 - 08/05/13	1,495	3,729	3,825	1,494	10,543	0.013	11	3.6	1.4	16	0.013	11	0.41	0.028	11	<0.01	0.16	3.2	1.4	4.8	<0.01	0.31	0.10	0.040	0.46	<0.01	0.31	0.012	<0.01	0.31	<0.01	<0.01	0.091	0.040	0.14
08/05/13 - 09/03/13	1,323	3,307	3,307	1,323	9,260	0.011	10	3.2	1.2	14	0.011	10	0.35	0.024	10	<0.01	0.15	2.8	1.2	4.2	<0.01	0.34	0.11	0.041	0.48	<0.01	0.34	0.012	<0.01	0.34	<0.01	<0.01	0.097	0.041	0.14
09/03/13 - 10/07/13	1,462	3,735	3,675	1,494	10,366	0.012	11	3.5	1.4	16	0.012	11	0.39	0.028	11	<0.01	0.16	3.1	1.4	4.7	<0.01	0.32	0.10	0.041	0.47	<0.01	0.32	0.011	<0.01	0.32	<0.01	<0.01	0.091	0.041	0.14
Subtotal Jul-Sept 2013 [12]	4,280	10,771	10,807	4,311	30,169	0.036	32	10	4.0	46	0.036	32	1.2	0.080	33	<0.01	0.47	9.1	4.0	14	<0.01	0.33	0.10	0.041	0.47	<0.01	0.33	0.012	<0.01	0.34	<0.01	<0.01	0.093	0.041	0.14
October 2013 through December 2013 Totals																																		
10/07/13 - 11/04/13	1,275	2,968	2,860	1,262	8,365	0.011	7	1.8	1.1	9.9	0.011	7	0.26	0.031	7.3	<0.01	0.12	1.5	1.1	2.7	<0.01	0.25	0.064	0.039	0.35	<0.01	0.25	<0.01	<0.01	0.26	<0.01	<0.01	0.054	0.039	0.10
11/04/13 - 12/09/13	1,553	3,936	2,974	1,576	10,039	0.013	9.8	1.8	1.4	13	0.013	9.6	0.27	0.039	10	<0.01	0.16	1.6	1.3	3.1	<0.01	0.28	0.051	0.040	0.37	<0.01	0.27	<0.01	<0.01	0.29	<0.01	<0.01	0.046	0.037	0.089
12/09/13 - 01/06/14	1,272	3,115	3,021	1,272	8,680	0.011	7.7	1.9	1.1	11	0.011	7.6	0.27	0.031	7.9	<0.01	0.13	1.6	1.1	2.8	<0.01	0.28	0.068	0.039	0.39	<0.01	0.27	<0.01	<0.01	0.28	<0.01	<0.01	0.057	0.039	0.100
Subtotal Oct-Dec 2013 [13]	4,100	10,019	8,855	4,110	27,084	0.035	25	6	3.6	35	0.035	24	0.80	0.10	25	<0.01	0.41	4.7	3.5	8.6	<0.01	0.27	0.066	0.040	0.38	<0.01	0.26	<0.01	<0.01	0.27	<0.01	<0.01	0.052	0.038	0.095
2013 Totals [14]	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
Total [15]	68,901	158,497	165,271	68,981	461,650	1.5	839	891	239	1,968	1.5	834	98	1.1	935	<0.01	4.9	792	238	1,029	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See notes on next 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.

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 TVOC 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, and 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) Starting with the January 2013 site visit the totalized water flow readings are recorded from the SCADA HMI.
(10) The volume of groundwater recovered and mass recovered calculations represent the operational period between January 7, 2013 and April 1, 2013.
(11) The volume of groundwater recovered and mass recovered calculations represent the operational period between April 1, 2013 and July 1, 2013.
(12) The volume of groundwater recovered and mass recovered calculations represent the operational period between July 1, 2013 and October 7, 2013.
(13) The volume of groundwater recovered and mass recovered calculations represent the operational period between October 7, 2013 and January 6, 2014.
(14) The volume of groundwater recovered and mass recovered calculations represent the operational period between January 7, 2013 and January 6, 2014.
(15) "Total" refers to the amounts removed by the Operable Unit 3 Bethpage Park Groundwater Containment System.

Acronyms\Key:

gal	Gallons.
lbs	Pounds.
lbs/day	Pounds per day.
NA	Not applicable.
TVOC	Total volatile organic compounds.
<	Less than.

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

Compound [1]	AGC [2] ($\mu g/m^3$)	Percent of MASC Per Event [3]				Percent AGC [4]
		2/4/13	4/1/13	7/1/13	11/14/13	
1,1,1 - Trichloroethane	5,000	0.00%	0.00%	0.00%	0.00%	0.00%
1,1 - Dichloroethane	0.63	0.04%	0.10%	0.04%	0.03%	0.05%
1,1 - Dichloroethene	70	0.00%	0.00%	0.00%	0.00%	0.00%
Acetone	30,000	0.00%	0.00%	0.00%	0.00%	0.00%
Carbon Disulfide	700	0.00%	0.00%	0.00%	0.00%	0.00%
Chloroform	0.043	1.31%	1.76%	0.99%	1.04%	1.19%
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%
Tetrachloroethene	1.0	0.00%	0.00%	0.00%	0.00%	0.00%
Trichloroethene	0.5	0.14%	0.12%	0.06%	0.00%	0.06%
Vinyl Chloride	0.11	8.09%	5.91%	6.88%	0.36%	4.38%
cis 1,2 Dichloroethene	63	0.01%	0.01%	0.01%	0.00%	0.01%
trans 1,2 Dichloroethene	63	0.00%	0.00%	0.00%	0.00%	0.00%
Benzene	0.13	0.13%	0.27%	0.20%	0.11%	0.16%
Toluene	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%

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) Only VOCs that were detected in the effluent vapor sample (VSP-5) over the past year of system operation are included in this table.

(2) AGC refers to the compound-specific annual guideline concentration per the NYSDEC DAR-1 AGC/SGC tables, revised October 18, 2010. 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.

(3) 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.

(4) Percent AGC is the twelve 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-1.
MASC Maximum allowable stack concentration.
NYSDEC New York State Department of Environmental Conservation.
SGC Short-term Guideline Concentration.

Table 9. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Remedial Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-1 7/29/2009	RW-1 8/12/2009	RW-1 9/10/2009	RW-1 11/10/2009	RW-1 12/2/2009	RW-1 2/2/2010
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	**6.5 J**	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	**3.5 J**	< 50	**2.9 J**	**1.5 J**	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5 R	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	**3 J**	**2.4 J**	**1.9 J**	**1.4 J**	**1.3 J**	**0.8 J**
Chloromethane	5	< 5	< 5	< 5	< 5	< 5 R	< 5
cis-1,2-dichloroethene	5	**1.5 J**	**1.5 J**	**1.4 J**	**1.5 J**	**1.7 J**	**1.5 J**
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 5
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	5	**1.3 J**	**1.7 J**	**1.5 J**	**1.8 J**	**2 J**	**2 J**
Trichlorofluoromethane (CFC-11)	5	--	--	--	--	--	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5	< 5
Total VOCs [2]		**15.8**	**5.6**	**7.7**	**6.2**	**5.0**	**4.3**
Project VOCs [3]		**2.8**	**3.2**	**2.9**	**3.3**	**3.7**	**3.5**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-1 4/12/2010	RW-1 7/20/2010	RW-1 10/4/2010	RW-1 1/10/2011	RW-1 4/8/2011	RW-1 7/8/2011
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 5	< 5
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 5	< 5
2-Butanone	NE	< 50	< 50	< 50	< 50	< 50	< 50
2-Hexanone	50	< 50	< 50	< 50	< 50	< 50	< 50
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 50	< 50
Acetone	NE	< 50	< 50	< 50	< 50	< 50	< 50
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromoform	50	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	5	< 5	< 5	< 5	< 5	< 5	< 5
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 5	< 5
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane	5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroform	7	**0.42 J**	**0.36 J**	**0.31 J**	< 5	< 5	< 5
Chloromethane	5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene	5	**1.5 J**	**2 J**	**1.3 J**	**1.3 J**	**0.81 J**	**0.78 J**
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether	5	< 5	< 5	< 5	< 5	< 5	< 5
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	5	< 5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
Toluene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 5	< 5
Trichloroethylene	5	**2.4 J**	**3.4 J**	**3 J**	**2.4 J**	**1.9 J**	**1.8 J**
Trichlorofluoromethane (CFC-11)	5	< 5	< 5	< 5	< 5	< 5	< 5
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 2	< 2
Xylene-o	5	< 5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 5	< 5
Total VOCs [2]		**4.3**	**5.8**	**4.6**	**3.7**	**2.7**	**2.6**
Project VOCs [3]		**3.9**	**5.4**	**4.3**	**3.7**	**2.7**	**2.6**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-1 10/3/2011	RW-1 1/9/2012	RW-1 4/3/2012	RW-1 7/2/2012	RW-1 10/1/2012	RW-1 1/7/2013
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
1,1,2,2-Tetrachloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
1,1,2-Trichloroethane	1	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
1,1-Dichloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
1,1-Dichloroethene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
1,2-Dichloroethane	0.6	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
1,2-Dichloropropane	1	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
2-Butanone	NE	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Acetone	NE	< 50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Benzene	1	< 0.7	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U
Bromodichloromethane	50	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Bromoform	50	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Bromomethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Carbon Disulfide	60	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Carbon tetrachloride	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Chlorobenzene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Chlorodifluoromethane (Freon 22)	NE	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Chloroethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Chloroform	7	< 5	**0.22 J**	**0.21 J**	**0.23 J**	< 5 U	< 5 U
Chloromethane	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
cis-1,2-dichloroethene	5	**0.94 J**	**0.95 J**	**0.65 J**	**0.58 J**	**0.37 J**	**0.34 J**
cis-1,3-dichloropropene	0.4	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Dibromochloromethane	50	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Ethylbenzene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Methyl tert-Butyl Ether	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Methylene Chloride	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Styrene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Tetrachloroethene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Toluene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
trans-1,2-dichloroethene	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
trans-1,3-dichloropropene	0.4	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Trichloroethylene	5	**1.8 J**	**1.8 J**	**1.7 J**	**1.4 J**	**0.95 J**	**0.86 J**
Trichlorofluoromethane (CFC-11)	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Vinyl Chloride	2	< 2	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
Xylene-o	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Xylenes - m,p	5	< 5	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Total VOCs [2]		**2.7**	**3.0**	**2.6**	**2.2**	**1.3**	**1.2**
Project VOCs [3]		**2.7**	**2.8**	**2.4**	**2.0**	**1.3**	**1.2**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-1 4/1/2013	RW-1 7/1/2013	RW-1 11/14/2013
	NYSDEC SCGs			
1,1,1-Trichloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2,2-Tetrachloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethene	5	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloroethane	0.6	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 5.0 U	< 5.0 U	< 5.0 U
2-Butanone	NE	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50 U	< 50 U	< 50 U
Acetone	NE	< 50 U	< 50 U	< 50 U
Benzene	1	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromoform	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	< 5.0 U	< 5.0 U	< 5.0 U
Chloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	7	< 5.0 U	< 5.0 U	< 5.0 U
Chloromethane	5	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	**0.40 J**	**0.24 J**	**0.25 J**
cis-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	5	< 5.0 U	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5	< 5.0 U	< 5.0 U	< 5.0 U
Methylene Chloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Styrene	5	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	< 5.0 U	< 5.0 U	< 5.0 U
Toluene	5	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,2-dichloroethene	5	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Trichloroethylene	5	**0.70 J**	**0.77 J**	**0.77 J**
Trichlorofluoromethane (CFC-11)	5	< 5.0 U	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5.0 U	< 5.0 U	< 5.0 U
Vinyl Chloride	2	< 2.0 U	< 2.0 U	< 2.0 U
Xylene-o	5	< 5.0 U	< 5.0 U	< 5.0 U
Xylenes - m,p	5	< 5.0 U	< 5.0 U	< 5.0 U
Total VOCs [2]		**1.1**	**1.0**	**1.0**
Project VOCs [3]		**1.1**	**1.0**	**1.0**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 7/29/2009	RW-2 8/12/2009	RW-2 9/10/2009	RW-2 11/10/2009	RW-2 12/2/2009	RW-2 2/2/2010
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 100	< 100	< 50	< 25	< 25	< 25
1,1,2,2-Tetrachloroethane	5	< 100	< 100	< 50	< 25	< 25	< 25
1,1,2-Trichloroethane	1	< 100	< 100	< 50	< 25	< 25	< 25
1,1-Dichloroethane	5	**9.2 J**	**8.8 J**	**6.4 J**	**5.2 J**	**5.3 J**	**3.5 J**
1,1-Dichloroethene	5	< 100	< 100	< 50	**2.9 J**	**3.1 J**	< 25
1,2-Dichloroethane	0.6	< 100	< 100	< 50	< 25	< 25	< 25
1,2-Dichloropropane	1	< 100	< 100	< 50	< 25	< 25	< 25
2-Butanone	NE	< 1000	< 1000	< 500	< 250	< 250	< 250
2-Hexanone	50	< 1000	< 1000	< 500	< 250	< 250	< 250
4-methyl-2-pentanone	50	< 1000	< 1000	< 500	< 250	< 250	< 250
Acetone	NE	< 1000	< 1000	< 500	< 250	< 250	< 250
Benzene	1	< 14	< 14	< 7	< 3.5	< 3.5	< 3.5
Bromodichloromethane	50	< 100	< 100	< 50	< 25	< 25	< 25
Bromoform	50	< 100	< 100	< 50	< 25	< 25	< 25
Bromomethane	5	< 100	< 100	< 50	< 25	< 25 R	< 25
Carbon Disulfide	60	< 100	< 100	< 50	< 25	< 25	< 25
Carbon tetrachloride	5	< 100	< 100	< 50	< 25	< 25	< 25
Chlorobenzene	5	< 100	< 100	< 50	< 25	< 25	< 25
Chlorodifluoromethane (Freon 22)	NE	< 100	< 100	**4 J**	**3.5 J**	**3.3 J**	< 25
Chloroethane	5	< 100	< 100	< 50	< 25	< 25	< 25
Chloroform	7	< 100	< 100	**3.4 J**	**3 J**	**2.3 J**	**2 J**
Chloromethane	5	< 100	< 100	< 50	< 25	< 25 R	< 25
cis-1,2-dichloroethene	5	**2,600**	**2,300**	**1,300**	**930**	**880**	**590**
cis-1,3-dichloropropene	0.4	< 100	< 100	< 50	< 25	< 25	< 25
Dibromochloromethane	50	< 100	< 100	< 50	< 25	< 25	< 25
Dichlorodifluoromethane (Freon 12)	5	< 100	< 100	< 50	< 25	< 25	< 25
Ethylbenzene	5	**13 J**	**7.2 J**	**4.8 J**	**6.4 J**	**5.1 J**	**1.8 J**
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 25
Methylene Chloride	5	< 100	< 100	< 50	< 25	< 25	< 25
Styrene	5	< 100	< 100	< 50	< 25	< 25	< 25
Tetrachloroethene	5	< 100	< 100	< 50	< 25	< 25	< 25
Toluene	5	**520**	**170**	**190**	**200**	**150**	**49**
trans-1,2-dichloroethene	5	**12 J**	**21 J**	**32 J**	**6.2 J**	**2.1 J**	**49**
trans-1,3-dichloropropene	0.4	< 100	< 100	< 50	< 25	< 25	< 25
Trichloroethylene	5	**46 J**	**30 J**	**52**	**59**	**63**	**46**
Trichlorofluoromethane (CFC-11)	5	**--**	**--**	**--**	**--**	**--**	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 100	< 100	< 50	< 25	< 25	< 25
Vinyl Chloride	2	**630**	**670**	**370**	**210**	**210**	**83**
Xylene-o	5	**14 J**	**9.4 J**	**5.4 J**	**6 J**	**4.9 J**	< 25
Xylenes - m,p	5	**27 J**	**9.2 J**	**7.9 J**	**11 J**	**9 J**	< 25
Total VOCs [2]		**3,871**	**3,226**	**1,976**	**1,443**	**1,338**	**824**
Project VOCs [3]		**3,849**	**3,210**	**1,957**	**1,430**	**1,327**	**821**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 2/2/2010	RW-2 4/12/2010	RW-2 (dup) 4/12/2010	RW-2 7/20/2010	RW-2 10/4/2010	RW-2 1/10/2011
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 25	< 13	< 13	< 13	< 13	**0.78 J**
1,1,2,2-Tetrachloroethane	5	< 25	< 13	< 13	< 13	< 13	< 13
1,1,2-Trichloroethane	1	< 25	< 13	< 13	< 13	< 13	< 13
1,1-Dichloroethane	5	**3.9 J**	**3.2 J**	**3.6 J**	**2.3 J**	**2.2 J**	**3.5 J**
1,1-Dichloroethene	5	< 25	**3 J**	**3 J**	**2.1 J**	**2.2 J**	**4.9 J**
1,2-Dichloroethane	0.6	< 25	< 13	< 13	< 13	< 13	< 13
1,2-Dichloropropane	1	< 25	< 13	< 13	< 13	< 13	< 13
2-Butanone	NE	< 250	< 130	< 130	< 130	< 130	< 130
2-Hexanone	50	< 250	< 130	< 130	< 130	< 130	< 130
4-methyl-2-pentanone	50	< 250	< 130	< 130	< 130	< 130	< 130
Acetone	NE	< 250	< 130	< 130	< 130	< 130 B	< 130 B
Benzene	1	< 3.5	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Bromodichloromethane	50	< 25	< 13	< 13	< 13	< 13	< 13
Bromoform	50	< 25	< 13	< 13	< 13	< 13	< 13
Bromomethane	5	< 25	< 13	< 13	< 13	< 13	< 13
Carbon Disulfide	60	< 25	< 13	< 13	< 13	< 13	< 13
Carbon tetrachloride	5	< 25	< 13	< 13	< 13	< 13	< 13
Chlorobenzene	5	< 25	< 13	< 13	< 13	< 13	< 13
Chlorodifluoromethane (Freon 22)	NE	**2.6 J**	**1.7 J**	**1.7 J**	**1.1 J**	**1 J**	**1.4 J**
Chloroethane	5	< 25	< 13	< 13	< 13	< 13	< 13
Chloroform	7	**1.7 J**	**1.5 J**	**1.6 J**	**1.4 J**	**1.9 J**	**1.9 J**
Chloromethane	5	< 25	< 13	< 13	< 13	< 13	< 13
cis-1,2-dichloroethene	5	**590**	**480**	**440 D**	**310**	**270**	**460**
cis-1,3-dichloropropene	0.4	< 25	< 13	< 13	< 13	< 13	< 13
Dibromochloromethane	50	< 25	< 13	< 13	< 13	< 13	< 13
Dichlorodifluoromethane (Freon 12)	5	< 25	< 13	< 13	< 13	< 13	< 13
Ethylbenzene	5	**1.5 J**	**2.2 J**	**2.1 J**	**1.7 J**	**1.5 J**	**2.6 J**
Methyl tert-Butyl Ether	5	< 25	< 13	< 13	< 13	< 13	< 13
Methylene Chloride	5	**1.2 J**	< 13	< 13	< 13	< 13	< 13
Styrene	5	< 25	< 13	< 13	< 13	< 13	< 13
Tetrachloroethene	5	< 25	< 13	< 13	< 13	< 13	< 13
Toluene	5	**52**	**71**	**73**	**35**	**25**	**62**
trans-1,2-dichloroethene	5	**31**	< 13	**3.4 J**	**0.95 J**	< 13	< 13
trans-1,3-dichloropropene	0.4	< 25	< 13	< 13	< 13	< 13	< 13
Trichloroethylene	5	**44**	**43**	**45**	**35**	**36**	**51**
Trichlorofluoromethane (CFC-11)	5		< 13		< 13	< 13	< 13
Trichlorotrifluoroethane (Freon 113)	5	< 25	< 13	< 13	< 13	< 13	< 13
Vinyl Chloride	2	**93**	**94**	**96**	**54**	**45**	**87**
Xylene-o	5	**1.3 J**	**2.2 J**	**2.3 J**	**1.3 J**	**0.9 J**	**2.6 J**
Xylenes - m,p	5	**1.9 J**	**3.5 J**	**3.4 J**	**2.4 J**	**1.9 J**	**3.8 J**
Total VOCs [2]		**824**	**705**	**675**	**447**	**388**	**681**
Project VOCs [3]		**817**	**699**	**670**	**443**	**383**	**676**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 6/8/2011	RW-2 7/8/2011	RW-2 10/3/2011	RW-2 1/9/2012	RW-2 4/3/2012	RW-2 (dup.) 4/3/2012
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	**1.1 J**	**0.93 J**	**0.73 J**	< 13 U	**0.52 J**	< 10 U
1,1,2,2-Tetrachloroethane	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
1,1,2-Trichloroethane	1	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
1,1-Dichloroethane	5	**3.1 J**	**2.4 J**	**2.0 J**	**1.7 J**	**1.4 J**	**1.6 J**
1,1-Dichloroethene	5	**2.8 J**	**2.7 J**	**1.7 J**	**0.98 J**	**0.92 J**	**0.84 J**
1,2-Dichloroethane	0.6	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
1,2-Dichloropropane	1	**0.38 J**	< 13	< 13 U	< 13 U	< 10 U	< 10 U
2-Butanone	NE	< 50	< 130	< 130 U	< 130 U	< 100 U	< 100 U
2-Hexanone	50	< 50	< 130	< 130 U	< 130 U	< 100 U	< 100 U
4-methyl-2-pentanone	50	< 50	< 130	< 130 U	< 130 U	< 100 U	< 100 U
Acetone	NE	< 50	< 130	< 130 UB	**3.4 J**	< 100 U	**1.5 J**
Benzene	1	< 0.7	< 1.8	< 1.8 U	< 1.8 U	< 1.4 U	< 1.4 U
Bromodichloromethane	50	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Bromoform	50	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Bromomethane	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Carbon Disulfide	60	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Carbon tetrachloride	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Chlorobenzene	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Chlorodifluoromethane (Freon 22)	NE	**0.98 J**	**1.3 J**	**0.60 J**	**0.95 J**	**0.64 J**	**0.48 J**
Chloroethane	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Chloroform	7	**1.3 J**	**1.3 J**	**1.1 J**	**1.4 J**	**1 J**	**1.1 J**
Chloromethane	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
cis-1,2-dichloroethene	5	**300 D**	**320**	**280**	**260**	**220**	**220**
cis-1,3-dichloropropene	0.4	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Dibromochloromethane	50	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Dichlorodifluoromethane (Freon 12)	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Ethylbenzene	5	**1.7 J**	**2.4 J**	**2.5 J**	**2.4 J**	**1.5 J**	**1.6 J**
Methyl tert-Butyl Ether	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Methylene Chloride	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Styrene	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Tetrachloroethene	5	**0.43 J**	< 13	**0.58 J**	< 13 U	< 10 U	< 10 U
Toluene	5	**62**	**81**	**72**	**81**	**60**	**61**
trans-1,2-dichloroethene	5	**0.42 J**	< 13	**0.63 J**	< 13 U	**0.46 J**	< 10 U
trans-1,3-dichloropropene	0.4	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Trichloroethylene	5	**30**	**25**	**25**	**23**	**18**	**18**
Trichlorofluoromethane (CFC-11)	5	< 5 U	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 13	< 13 U	< 13 U	< 10 U	< 10 U
Vinyl Chloride	2	**88**	**67**	**55**	**59**	**54**	**54**
Xylene-o	5	**2.6 J**	**2.6 J**	**2.6 J**	**2.6 J**	**2.2 J**	**2.3 J**
Xylenes - m,p	5	**4.5 J**	**4.6 J**	**4.2 J**	**4.7 J**	**3.6 J**	**4.1 J**
Total VOCs [2]		**499**	**511**	**449**	**441**	**364**	**367**
Project VOCs [3]		**495**	**506**	**444**	**433**	**361**	**362**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 7/2/2012	RW-2 10/1/2012	RW-2 1/7/2013	RW-2 4/1/2013	RW-2 (dup.) 4/1/2013	RW-2 7/1/2013
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	**0.46 J**	**0.51 J**	**0.41 J**	**0.39 J**	**0.37 J**	**0.27 J**
1,1,2,2-Tetrachloroethane	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	**1.5 J**	**1.6 J**	**1.6 J**	**1.8 J**	**2.0 J**	**1.5 J**
1,1-Dichloroethene	5	**1.2 J**	**1 J**	**0.82 J**	**0.85 J**	**0.83 J**	**0.77 J**
1,2-Dichloroethane	0.6	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 5 U	**0.28 J**	< 5 U	< 5.0 U	0.47 J	< 5.0 U
2-Butanone	NE	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Acetone	NE	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Benzene	1	< 0.7 U	< 0.7 U	< 0.7 U	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Bromoform	50	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	5	**0.22 J**	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	**0.44 J**	**0.4 J**	**0.33 J**	< 5.0 U	< 5.0 U	< 5.0 U
Chloroethane	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	7	**1.4 J**	**1.9 J**	**2.1 J**	**2.2 J**	**2.3 J**	**2.2 J**
Chloromethane	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	**200**	**200**	**160**	**170 D**	**180 D**	**140**
cis-1,3-dichloropropene	0.4	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	5	**2.8 J**	**3.3 J**	**2.3 J**	**3.6 J**	**3.7 J**	**3.1 J**
Methyl tert-Butyl Ether	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Methylene Chloride	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Styrene	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	0.4 J	**0.36 J**	**0.38 J**	**0.34 J**	**0.36 J**	**0.33 J**
Toluene	5	**73**	**96**	**82**	**110**	**110**	**95**
trans-1,2-dichloroethene	5	**0.87 J**	**0.26 J**	< 5 U	**0.26 J**	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Trichloroethylene	5	**20**	**20**	**18**	**16**	**16**	**17**
Trichlorofluoromethane (CFC-11)	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5 U	< 5 U	< 5 U	< 5.0 U	< 5.0 U	< 5.0 U
Vinyl Chloride	2	**44**	**61**	**75**	**110**	**110**	**100**
Xylene-o	5	**2.6 J**	**2.7 J**	**3.2 J**	**4.1 J**	**4.5 J**	**3.1 J**
Xylenes - m,p	5	**4.5 J**	**5.8**	**5.3**	**8.6**	**8.9**	**5.6**
Total VOCs [2]		**353**	**395**	**351**	**428**	**439**	**369**
Project VOCs [3]		**349**	**374**	**347**	**422**	**433**	**364**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	NYSDEC SCGs	Sample Location: RW-2 Sample Date: 11/14/2013
1,1,1-Trichloroethane	5	< 5.0 U
1,1,2,2-Tetrachloroethane	5	< 5.0 U
1,1,2-Trichloroethane	1	< 5.0 U
1,1-Dichloroethane	5	**1.0 J**
1,1-Dichloroethene	5	**0.54 J**
1,2-Dichloroethane	0.6	< 5.0 U
1,2-Dichloropropane	1	< 5.0 U
2-Butanone	NE	< 50 U
2-Hexanone	50	< 50 U
4-methyl-2-pentanone	50	< 50 U
Acetone	NE	< 50 U
Benzene	1	< 0.70 U
Bromodichloromethane	50	< 5.0 U
Bromoform	50	< 5.0 U
Bromomethane	5	< 5.0 U
Carbon Disulfide	60	< 5.0 U
Carbon tetrachloride	5	< 5.0 U
Chlorobenzene	5	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	< 5.0 U
Chloroethane	5	< 5.0 U
Chloroform	7	**2.0 J**
Chloromethane	5	< 5.0 U
cis-1,2-dichloroethene	5	**100**
cis-1,3-dichloropropene	0.4	< 5.0 U
Dibromochloromethane	50	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5.0 U
Ethylbenzene	5	**2.9 J**
Methyl tert-Butyl Ether	5	< 5.0 U
Methylene Chloride	5	< 5.0 U
Styrene	5	< 5.0 U
Tetrachloroethene	5	**0.25 J**
Toluene	5	**84**
trans-1,2-dichloroethene	5	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5.0 U
Trichloroethylene	5	**13**
Trichlorofluoromethane (CFC-11)	5	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5.0 U
Vinyl Chloride	2	**88**
Xylene-o	5	**3.1 J**
Xylenes - m,p	5	**6.8**
Total VOCs [2]		**302**
Project VOCs [3]		**297**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 7/29/2009	RW-3 8/12/2009	RW-3 9/10/2009	RW-3 11/10/2009	RW-3 12/2/2009	RW-3 2/2/2010
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 13	< 25
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 13	< 25
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 13	< 25
1,1-Dichloroethane	5	**2.4 J**	**2.1 J**	**1.9 J**	**1.4 J**	**1.3 J**	< 25
1,1-Dichloroethene	5	< 5	**0.35 J**	**0.41 J**	**0.53 J**	< 13	< 25
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 13	< 25
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 13	< 25
2-Butanone	NE	< 50	< 50	< 50	< 50	< 130	< 250
2-Hexanone	50	< 50	< 50	< 50	< 50	< 130	< 250
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 130	< 250
Acetone	NE	< 50	< 50	**2 J**	**3.1 J**	< 130	< 250
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 1.8	< 3.5
Bromodichloromethane	50	**0.35 J**	< 5	< 5	< 5	< 13	< 25
Bromoform	50	< 5	< 5	< 5	< 5	< 13	< 25
Bromomethane	5	< 5	< 5	< 5	< 5	< 13	< 25
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 13	< 25
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 13	< 25
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 13	< 25
Chlorodifluoromethane (Freon 22)	NE	**2.1 J**	**8.5**	**93**	**490 D**	**660 D**	**1,300 D**
Chloroethane	5	< 5	< 5	< 5	< 5	< 13	< 25
Chloroform	7	**2.1 J**	**2.3 J**	**2.9 J**	**5.9**	**6 J**	**4.3 J**
Chloromethane	5	< 5	< 5	< 5	< 5	< 13 R	< 25
cis-1,2-dichloroethene	5	**130**	**120**	**130**	**85**	**72**	**68**
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 13	< 25
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 13	< 25
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 13	< 25
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 13	< 25
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 25
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 13	< 25
Styrene	5	< 5	< 5	< 5	< 5	< 13	< 25
Tetrachloroethene	5	**0.81 J**	**0.56 J**	**0.83 J**	**0.54 J**	< 13	< 25
Toluene	5	< 5	< 5	< 5	< 5	< 13	< 25
trans-1,2-dichloroethene	5	**0.68 J**	**0.54 J**	**0.59 J**	**0.52 J**	< 13	**7.2 J**
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 13	< 25
Trichloroethylene	5	**37**	**34**	**29**	**24**	**22**	**19 J**
Trichlorofluoromethane (CFC-11)	5	--	--	--	--	--	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 13	< 25
Vinyl Chloride	2	< 2	< 2	**0.47 J**	**0.42 J**	< 5	< 10
Xylene-o	5	< 5	< 5	< 5	< 5	< 13	< 25
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 13	< 25
Total VOCs [2]		**175**	**168**	**261**	**611**	**761**	**1,399**
Project VOCs [3]		**171**	**158**	**163**	**112**	**95**	**94**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 4/12/2010	RW-3 7/20/2010	RW-3 10/4/2010	RW-3 1/10/2011	RW-3 4/8/2011	RW-3 7/8/2011
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
1,1,2,2-Tetrachloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
1,1,2-Trichloroethane	1	< 25	< 50	< 25	< 25	< 25	< 25
1,1-Dichloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
1,1-Dichloroethene	5	< 25	< 50	< 25	< 25	< 25	< 25
1,2-Dichloroethane	0.6	< 25	< 50	< 25	< 25	< 25	< 25
1,2-Dichloropropane	1	< 25	< 50	< 25	< 25	< 25	< 25
2-Butanone	NE	< 250	< 500	< 250	< 250	< 250	< 250
2-Hexanone	50	< 250	< 500	< 250	< 250	< 250	< 250
4-methyl-2-pentanone	50	< 250	< 500	< 250	< 250	< 250	< 250
Acetone	NE	< 250	< 500	< 250	< 250 B	< 250	< 250
Benzene	1	< 3.5	< 7	< 3.5	< 3.5	< 3.5	< 3.5
Bromodichloromethane	50	< 25	< 50	< 25	< 25	< 25	< 25
Bromoform	50	< 25	< 50	< 25	< 25	< 25	< 25
Bromomethane	5	< 25	< 50	< 25	< 25	< 25	< 25
Carbon Disulfide	60	< 25	< 50	< 25	< 25	< 25	< 25
Carbon tetrachloride	5	< 25	< 50	< 25	< 25	< 25	< 25
Chlorobenzene	5	< 25	< 50	< 25	< 25	< 25	< 25
Chlorodifluoromethane (Freon 22)	NE	**1,300 D**	**1400**	**880**	**890**	**900**	**670**
Chloroethane	5	< 25	< 50	< 25	< 25	< 25	< 25
Chloroform	7	**3.2 J**	< 50	**6.6 J**	**5.8 J**	**4.0 J**	**2.5 J**
Chloromethane	5	< 25	< 50	< 25	< 25	< 25	< 25
cis-1,2-dichloroethene	5	**70**	**64**	**64**	**74**	**93**	**110**
cis-1,3-dichloropropene	0.4	< 25	< 50	< 25	< 25	< 25	< 25
Dibromochloromethane	50	< 25	< 50	< 25	< 25	< 25	< 25
Dichlorodifluoromethane (Freon 12)	5	< 25	< 50	< 25	< 25	< 25	< 25
Ethylbenzene	5	< 25	< 50	< 25	< 25	< 25	< 25
Methyl tert-Butyl Ether	5	< 25	< 50	< 25	< 25	< 25	< 25
Methylene Chloride	5	< 25	< 50	< 25	< 25	< 25	< 25
Styrene	5	< 25	< 50	< 25	< 25	< 25	< 25
Tetrachloroethene	5	< 25	< 50	< 25	< 25	< 25	< 25
Toluene	5	< 25	< 50	< 25	< 25	< 25	< 25
trans-1,2-dichloroethene	5	< 25	**4.8 J**	**6.7 J**	**3.9 J**	**6.5 J**	< 25
trans-1,3-dichloropropene	0.4	< 25	< 50	< 25	< 25	< 25	< 25
Trichloroethylene	5	**17 J**	**14 J**	**12 J**	**10 J**	**6.8 J**	**7.7 J**
Trichlorofluoromethane (CFC-11)	5	< 25	< 50	< 25	< 25	< 25	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 25	< 50	< 25	< 25	< 25	< 25
Vinyl Chloride	2	< 10	< 20	**2.6 J**	**5.1 J**	**11**	**9.9 J**
Xylene-o	5	< 25	< 50	< 25	< 25	< 25	< 25
Xylenes - m,p	5	< 25	< 50	< 25	< 25	< 25	< 25
Total VOCs [2]		**1,390**	**1,483**	**972**	**989**	**1,021**	**800**
Project VOCs [3]		**87**	**83**	**85**	**93**	**117**	**128**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 10/3/2011	RW-3 1/9/2012	RW-3 4/3/2012	RW-3 7/2/2012	RW-3 10/1/2012	RW-3 1/7/2013
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
1,1,2,2-Tetrachloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
1,1,2-Trichloroethane	1	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
1,1-Dichloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	**0.21 J**
1,1-Dichloroethene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
1,2-Dichloroethane	0.6	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
1,2-Dichloropropane	1	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
2-Butanone	NE	< 250 U	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U
2-Hexanone	50	< 250 U	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U
4-methyl-2-pentanone	50	< 250 U	< 130 U	< 130 U	< 100 U	< 100 U	< 50 U
Acetone	NE	< 250 U	< 130 U	< 130 U	< 100 UB	< 100 U	< 50 U
Benzene	1	< 3.5 U	< 1.8 U	< 1.8 U	< 1.4 U	< 1.4 U	< 0.7 U
Bromodichloromethane	50	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Bromoform	50	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Bromomethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Carbon Disulfide	60	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Carbon tetrachloride	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Chlorobenzene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Chlorodifluoromethane (Freon 22)	NE	**540**	**390**	**460**	**270**	**230**	**190**
Chloroethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Chloroform	7	**5.5 J**	**6.9 J**	**3.4 J**	**2.9 J**	**5.3 J**	**4.9 J**
Chloromethane	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
cis-1,2-dichloroethene	5	**92**	**55**	**33**	**22**	**17**	**12**
cis-1,3-dichloropropene	0.4	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Dibromochloromethane	50	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Dichlorodifluoromethane (Freon 12)	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Ethylbenzene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Methyl tert-Butyl Ether	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Methylene Chloride	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Styrene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Tetrachloroethene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	**0.33 J**
Toluene	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
trans-1,2-dichloroethene	5	**1.8 J**	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
trans-1,3-dichloropropene	0.4	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Trichloroethylene	5	**7.5 J**	**6.7 J**	**6 J**	**6.5 J**	**5.3 J**	**5.1**
Trichlorofluoromethane (CFC-11)	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Trichlorotrifluoroethane (Freon 113)	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Vinyl Chloride	2	**7.1 J**	**2.8 J**	**1.2 J**	**0.8 J**	**0.48 J**	**0.25 J**
Xylene-o	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Xylenes - m,p	5	< 25 U	< 13 U	< 13 U	< 10 U	< 10 U	< 5 U
Total VOCs [2]		**654**	**461**	**504**	**302**	**258**	**213**
Project VOCs [3]		**108**	**65**	**40**	**29**	**23**	**18**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 4/1/2013	RW-3 7/1/2013	RW-3 11/14/2013
	NYSDEC SCGs			
1,1,1-Trichloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2,2-Tetrachloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	< 5.0 U	**0.21 J**	**0.23 J**
1,1-Dichloroethene	5	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloroethane	0.6	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 5.0 U	< 5.0 U	< 5.0 U
2-Butanone	NE	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50 U	< 50 U	< 50 U
Acetone	NE	< 50 U	< 50 U	< 50 U
Benzene	1	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromoform	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	**130**	**98**	**61**
Chloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	7	**3.5 J**	**3.6 J**	**2.5 J**
Chloromethane	5	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	**9.4**	**7.7**	**6.1**
cis-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5.0 U	< 5.0 U	**0.33 J**
Ethylbenzene	5	< 5.0 U	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5	< 5.0 U	< 5.0 U	< 5.0 U
Methylene Chloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Styrene	5	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	**0.29 J**	**0.38 J**	**0.28 J**
Toluene	5	< 5.0 U	< 5.0 U	**0.31 J**
trans-1,2-dichloroethene	5	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Trichloroethylene	5	**4.3 J**	**4.5 J**	**3.9 J**
Trichlorofluoromethane (CFC-11)	5	< 5.0 U	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	< 5.0 U	**0.30 J**	< 5.0 U
Vinyl Chloride	2	**0.24 J**	< 2.0 U	< 2.0 U
Xylene-o	5	< 5.0 U	< 5.0 U	< 5.0 U
Xylenes - m,p	5	< 5.0 U	< 5.0 U	< 5.0 U
Total VOCs [2]		**148**	**115**	**75**
Project VOCs [3]		**14**	**13**	**11**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-4 7/29/2009	RW-4 8/12/2009	RW-4 9/10/2009	RW-4 11/10/2009	RW-4 12/2/2009	RW-4 2/2/2010
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 5	< 5	< 5	< 5	< 10	< 10
1,1,2,2-Tetrachloroethane	5	< 5	< 5	< 5	< 5	< 10	< 10
1,1,2-Trichloroethane	1	< 5	< 5	< 5	< 5	< 10	< 10
1,1-Dichloroethane	5	**0.42 J**	**0.38 J**	**0.47 J**	**0.52 J**	< 10	**0.6 J**
1,1-Dichloroethene	5	< 5	< 5	< 5	< 5	< 10	< 10
1,2-Dichloroethane	0.6	< 5	< 5	< 5	< 5	< 10	< 10
1,2-Dichloropropane	1	< 5	< 5	< 5	< 5	< 10	< 10
2-Butanone	NE	< 50	< 50	< 50	< 50	< 100	< 100
2-Hexanone	50	< 50	< 50	< 50	< 50	< 100	< 100
4-methyl-2-pentanone	50	< 50	< 50	< 50	< 50	< 100	< 100
Acetone	NE	< 50	< 50	< 50	**3.5 J**	< 100	< 100
Benzene	1	< 0.7	< 0.7	< 0.7	< 0.7	< 1.4	< 1.4
Bromodichloromethane	50	< 5	< 5	< 5	< 5	< 10	< 10
Bromoform	50	< 5	< 5	< 5	< 5	< 10	< 10
Bromomethane	5	< 5	< 5	< 5	< 5	< 10 R	< 10
Carbon Disulfide	60	< 5	< 5	< 5	< 5	< 10	< 10
Carbon tetrachloride	5	< 5	< 5	< 5	< 5	< 10	< 10
Chlorobenzene	5	< 5	< 5	< 5	< 5	< 10	< 10
Chlorodifluoromethane (Freon 22)	NE	**140**	**200**	**330 D**	**230 D**	**290**	**440 D**
Chloroethane	5	< 5	< 5	< 5	< 5	< 10	< 10
Chloroform	7	**1 J**	**0.88 J**	**0.78 J**	**0.95 J**	**0.88 J**	**0.72 J**
Chloromethane	5	< 5	< 5	< 5	< 5	< 10 R	< 10
cis-1,2-dichloroethene	5	**1.5 J**	**1.7 J**	**1.9 J**	**1.9 J**	**2.2 J**	**1.8 J**
cis-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 10	< 10
Dibromochloromethane	50	< 5	< 5	< 5	< 5	< 10	< 10
Dichlorodifluoromethane (Freon 12)	5	< 5	< 5	< 5	< 5	< 10	< 10
Ethylbenzene	5	< 5	< 5	< 5	< 5	< 10	< 10
Methyl tert-Butyl Ether	5	--	--	--	--	--	< 10
Methylene Chloride	5	< 5	< 5	< 5	< 5	< 10	< 10
Styrene	5	< 5	< 5	< 5	< 5	< 10	< 10
Tetrachloroethene	5	**0.44 J**	**0.44 J**	**0.44 J**	**0.48 J**	< 10	**0.64 J**
Toluene	5	< 5	< 5	< 5	< 5	< 10	< 10
trans-1,2-dichloroethene	5	< 5	< 5	< 5	< 5	< 10	< 10
trans-1,3-dichloropropene	0.4	< 5	< 5	< 5	< 5	< 10	< 10
Trichloroethylene	5	**1.1 J**	**1.2 J**	**1.6 J**	**1.9 J**	**1.8 J**	**1.4 J**
Trichlorofluoromethane (CFC-11)	5	--	--	--	--	--	< 10
Trichlorotrifluoroethane (Freon 113)	5	< 5	< 5	< 5	< 5	< 10	< 10
Vinyl Chloride	2	< 2	< 2	< 2	< 2	< 4	< 4
Xylene-o	5	< 5	< 5	< 5	< 5	< 10	< 10
Xylenes - m,p	5	< 5	< 5	< 5	< 5	< 10	< 10
Total VOCs [2]		**144**	**205**	**335**	**239**	**295**	**445**
Project VOCs [3]		**3.5**	**3.7**	**4.4**	**4.8**	**4.0**	**4.4**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-4 4/12/2010	RW-4 7/20/2010	RW-4 10/4/2010	RW-4 1/10/2011	RW-4 4/8/2011	RW-4 7/8/2011
	NYSDEC SCGs						
1,1,1-Trichloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
1,1,2,2-Tetrachloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
1,1,2-Trichloroethane	1	< 13	< 25	< 25	< 25	< 25	< 25
1,1-Dichloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
1,1-Dichloroethene	5	< 13	< 25	< 25	< 25	< 25	< 25
1,2-Dichloroethane	0.6	< 13	< 25	< 25	< 25	< 25	< 25
1,2-Dichloropropane	1	< 13	< 25	< 25	< 25	< 25	< 25
2-Butanone	NE	< 130	< 250	< 250	< 250	< 250	< 250
2-Hexanone	50	< 130	< 250	< 250	< 250	< 250	< 250
4-methyl-2-pentanone	50	< 130	< 250	< 250	< 250	< 250	< 250
Acetone	NE	< 130	< 250	< 250	< 250	< 250	< 250
Benzene	1	< 1.8	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5
Bromodichloromethane	50	< 13	< 25	< 25	< 25	< 25	< 25
Bromoform	50	< 13	< 25	< 25	< 25	< 25	< 25
Bromomethane	5	< 13	< 25	< 25	< 25	< 25	< 25
Carbon Disulfide	60	< 13	< 25	< 25	< 25	< 25	< 25
Carbon tetrachloride	5	< 13	< 25	< 25	< 25	< 25	< 25
Chlorobenzene	5	< 13	< 25	< 25	< 25	< 25	< 25
Chlorodifluoromethane (Freon 22)	NE	**560 D**	**840**	**850**	**820**	**650**	**520**
Chloroethane	5	< 13	< 25	< 25	< 25	< 25	< 25
Chloroform	7	**0.8 J**	< 25	< 25	< 25	< 25	< 25
Chloromethane	5	< 13	< 25	< 25	< 25	< 25	< 25
cis-1,2-dichloroethene	5	**1.5 J**	< 25	< 25	< 25	< 25	< 25
cis-1,3-dichloropropene	0.4	< 13	< 25	< 25	< 25	< 25	< 25
Dibromochloromethane	50	< 13	< 25	< 25	< 25	< 25	< 25
Dichlorodifluoromethane (Freon 12)	5	< 13	< 25	< 25	< 25	< 25	< 25
Ethylbenzene	5	< 13	< 25	< 25	< 25	< 25	< 25
Methyl tert-Butyl Ether	5	< 13	< 25	< 25	< 25	< 25	< 25
Methylene Chloride	5	< 13	< 25	< 25	< 25	< 25	< 25
Styrene	5	< 13	< 25	< 25	< 25	< 25	< 25
Tetrachloroethene	5	**0.9 J**	< 25	< 25	< 25	< 25	< 25
Toluene	5	< 13	< 25	< 25	< 25	< 25	< 25
trans-1,2-dichloroethene	5	< 13	< 25	< 25	< 25	< 25	< 25
trans-1,3-dichloropropene	0.4	< 13	< 25	< 25	< 25	< 25	< 25
Trichloroethylene	5	**1.4 J**	< 25	< 25	< 25	< 25	< 25
Trichlorofluoromethane (CFC-11)	5	< 13	< 25	< 25	< 25	< 25	< 25
Trichlorotrifluoroethane (Freon 113)	5	< 13	< 25	< 25	< 25	< 25	< 25
Vinyl Chloride	2	< 5	< 10	< 10	< 10	< 10	< 10
Xylene-o	5	< 13	< 25	< 25	< 25	< 25	< 25
Xylenes - m,p	5	< 13	< 25	< 25	< 25	< 25	< 25
Total VOCs [2]		**565**	**840**	**850**	**820**	**650**	**520**
Project VOCs [3]		**3.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

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 Grumman Settling Ponds), Bethpage, New York. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-4 4/1/2013	RW-4 7/1/2013	RW-4 11/14/2013
	NYSDEC SCGs			
1,1,1-Trichloroethane	5	< 5.0 U	< 5.0 U	**0.23 J**
1,1,2,2-Tetrachloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	1	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane	5	**0.52 J**	**0.45 J**	**0.38 J**
1,1-Dichloroethene	5	**0.22 J**	< 5.0 U	**0.25 J**
1,2-Dichloroethane	0.6	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane	1	< 5.0 U	< 5.0 U	< 5.0 U
2-Butanone	NE	< 50 U	< 50 U	< 50 U
2-Hexanone	50	< 50 U	< 50 U	< 50 U
4-methyl-2-pentanone	50	< 50 U	< 50 U	< 50 U
Acetone	NE	< 50 U	< 50 U	< 50 U
Benzene	1	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromoform	50	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide	60	< 5.0 U	< 5.0 U	< 5.0 U
Carbon tetrachloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene	5	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane (Freon 22)	NE	**140**	**110**	**100**
Chloroethane	5	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform	7	**0.25 J**	**0.36 J**	**0.37 J**
Chloromethane	5	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-dichloroethene	5	**0.29 J**	< 5.0 U	**0.22 J**
cis-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Dibromochloromethane	50	< 5.0 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane (Freon 12)	5	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene	5	< 5.0 U	< 5.0 U	< 5.0 U
Methyl tert-Butyl Ether	5	< 5.0 U	**0.30 J**	**0.24 J**
Methylene Chloride	5	< 5.0 U	< 5.0 U	< 5.0 U
Styrene	5	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene	5	**1.3 J**	**1.1 J**	**1.1 J**
Toluene	5	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,2-dichloroethene	5	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,3-dichloropropene	0.4	< 5.0 U	< 5.0 U	< 5.0 U
Trichloroethylene	5	**0.75 J**	**0.67 J**	**0.76 J**
Trichlorofluoromethane (CFC-11)	5	< 5.0 U	< 5.0 U	< 5.0 U
Trichlorotrifluoroethane (Freon 113)	5	**0.33 J**	**0.39 J**	**0.29 J**
Vinyl Chloride	2	< 2.0 U	< 2.0 U	< 2.0 U
Xylene-o	5	< 5.0 U	< 5.0 U	< 5.0 U
Xylenes - m,p	5	< 5.0 U	< 5.0 U	< 5.0 U
Total VOCs [2]		**144**	**113**	**104**
Project VOCs [3]		**3.1**	**2.2**	**2.9**

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 Grumman Settling Ponds), Bethpage, New York. (1)

Notes:

(1) Water samples collected by ARCADIS on the dates shown and submitted to Columbia Analytical Services, Inc. through December 2012 and to ALS Environmental from January 2013 through the current reporting period for VOC analysis using NYSDEC ASP 2005 Method OLM4.3. Results validated following protocols specified in Sampling and Analysis Plan in the December 2009 DRAFT OM&M Manual (ARCADIS 2009).

(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.
700	Bold data indicates that the analyte was detected.
ASP	Analytical services protocol.
B	Compound detected in associated blank sample.
D	Constituent identified from secondary dilution.
J	Value is estimated.
NE	Not established.
NYSDEC	New York State Department of Environmental Conservation.
R	Concentration for the constituent was rejected.
SCGs	Standards, criteria, and guidance values.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
UB	Compound considered non-detect due to associated blank contamination.
< 5; <5 U	Compound not detected above its laboratory quantification limit.
--	Not analyzed.

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. (1)

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-1 4/21/2009	RW-1 7/29/2009	RW-1 8/12/2009	RW-1 9/10/2009	RW-1 11/10/2009	RW-1 12/2/2009	RW-1 10/4/2010	RW-1 2/10/2011	RW-1 10/3/2011	RW-1 11/11/2011
	NYSDEC SCGs										
Total Cadmium	5	< 5	--	--	--	--	--	< 5	--	--	< 5
Dissolved Cadmium	5	< 5	--	--	--	--	--	< 5	--	--	< 5
Total Chromium	50	**24.3**	--	--	--	--	--	**27**	--	--	**23**
Dissolved Chromium	50	**20.2**	--	--	--	--	--	**27**	--	--	**24**
Total Iron	300	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	--
Dissolved Iron	300	< 100	--	--	--	--	--	< 100	< 100	< 100	--
Total Manganese	300	**23.6**	--	--	--	--	--	**12**	--	--	--
Dissolved Manganese	300	**22.4**	--	--	--	--	--	**11**	--	--	--
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--

See notes on last page.

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. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-1 [2] 10/1/2012	RW-1 1/7/2013	RW-1 4/1/2013	RW-1 7/1/2013	RW-1 11/14/2013
	NYSDEC SCGs					
Total Cadmium	5	< 5	--	--	--	< 5.0
Dissolved Cadmium	5	< 5	--	--	--	< 5.0
Total Chromium	50	**23**	--	--	--	**28**
Dissolved Chromium	50	**23**	--	--	--	**32**
Total Iron	300	< 100	--	--	--	< 100
Dissolved Iron	300	< 100	--	--	--	< 100
Total Manganese	300	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	< 0.20
Dissolved Mercury	0.7	--	--	--	--	--

See notes on last page.

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. (1)

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 4/21/2009	RW-2 7/29/2009	RW-2 8/12/2009	RW-2 9/10/2009	RW-2 10/9/2009	RW-2 11/10/2009	RW-2 12/2/2009	RW-2 1/11/2010	RW-2 2/2/2010	RW-2 3/10/2010
	NYSDEC SCGs										
Total Cadmium	5	< 5	--	--	--	--	--	--	--	--	--
Dissolved Cadmium	5	< 5	--	--	--	--	--	--	--	--	--
Total Chromium	50	< 10	--	--	--	--	--	--	--	--	--
Dissolved Chromium	50	< 10	--	--	--	--	--	--	--	--	--
Total Iron	300	**2,330**	**5,950**	**4,870**	**3,550**	**3,800**	**2,040**	**1,260**	**1,140**	**1,000**	**2,550**
Dissolved Iron	300	**781**	--	--	--	--	--	--	--	--	--
Total Manganese	300	**241**	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	**248**	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--

See notes on last page.

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. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 4/12/2010	RW-2 7/20/2010	RW-2 10/4/2010	RW-2 12/6/2010	RW-2 2/10/2011	RW-2 2/10/2011	RW-2 3/7/2011	RW-2 5/2/2011	RW-2 6/8/2011	RW-2 7/8/2011
	NYSDEC SCGs										
Total Cadmium	5	--	--	< 5	--	--	--	--	--	--	--
Dissolved Cadmium	5	--	--	< 5	--	--	--	--	--	--	--
Total Chromium	50	--	--	< 10	--	--	--	--	--	--	--
Dissolved Chromium	50	--	--	< 10	--	--	--	--	--	--	--
Total Iron	300	**880**	**1,180**	**710**	**590**	**970**	**970**	**850**	**890**	**830**	**3,110**
Dissolved Iron	300	--	--	**380**	**270**	**550**	**550**	**530**	**710**	**670**	**670**
Total Manganese	300	--	--	**187**	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	**192**	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

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. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 8/1/2011	RW-2 9/6/2011	RW-2 10/3/2011	RW-2 11/11/2011	RW-2 12/19/2011	RW-2 1/9/2012	RW-2 2/6/2012	RW-2 3/8/2012	RW-2 4/3/2012	RW-2 5/7/2012
	NYSDEC SCGs										
Total Cadmium	5	--	--	--	< 5	--	--	--	--	--	< 5
Dissolved Cadmium	5	--	--	--	< 5	--	--	--	--	--	< 5
Total Chromium	50	--	--	--	< 10	--	--	--	--	--	< 10
Dissolved Chromium	50	--	--	--	< 10	--	--	--	--	--	< 10
Total Iron	300	**840**	**830**	**1,640**	**750**	**930**	**870**	**960**	**990**	**930**	**970**
Dissolved Iron	300	**670**	**650**	**640**	**540**	**750**	**700**	**640**	**640**	**830**	**730**
Total Manganese	300	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

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. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 6/5/2012	RW-2 7/2/2012	RW-2 8/7/2012	RW-2 9/4/2012	RW-2 10/1/2012	RW-2 11/12/2012	RW-2 12/3/2012	RW-2 1/7/2013	RW-2 2/4/2013	RW-2[3] 3/4/2013
	NYSDEC SCGs										
Total Cadmium	5	--	--	--	--	< 5	--	--	--	--	--
Dissolved Cadmium	5	--	--	--	--	< 5	--	--	--	--	--
Total Chromium	50	--	--	--	--	< 10	--	--	--	--	--
Dissolved Chromium	50	--	--	--	--	< 10	--	--	--	--	--
Total Iron	300	**800**	**940**	**1,850**	**950**	**1,020**	**750**	**670**	**600**	**640**	**1,950**
Dissolved Iron	300	**690**	**840**	**780**	**810**	**780**	**610**	**540**	**560**	**520**	**1,920**
Total Manganese	300	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

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. [1]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-2 4/1/2013	RW-2 5/6/2013	RW-2 6/6/2013	RW-2 7/1/2013	RW-2 11/14/2013
	NYSDEC SCGs					
Total Cadmium	5	--	--	--	--	< 5.0
Dissolved Cadmium	5	--	--	--	--	< 5.0
Total Chromium	50	--	--	--	--	< 10
Dissolved Chromium	50	--	--	--	--	< 10
Total Iron	300	**1,070**	**700**	**990**	**1,200**	**1,540**
Dissolved Iron	300	**720**	**600**	**740**	**650**	**850**
Total Manganese	300	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	< 0.20
Dissolved Mercury	0.7	--	--	--	--	--

See notes on last page.

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. (1)

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 4/22/2009	RW-3 7/29/2009	RW-3 9/10/2009	RW-3 11/10/2009	RW-3 12/2/2009	RW-3 3/10/2010	RW-3 4/12/2010	RW-3 7/20/2010	RW-3 10/4/2010	RW-3 12/6/2010
	NYSDEC SCGs										
Total Cadmium	5	< 5	--	--	--	--	--	--	--	< 5	--
Dissolved Cadmium	5	< 5	--	--	--	--	--	--	--	< 5	--
Total Chromium	50	**22.6**	--	--	--	--	--	--	--	< 10	--
Dissolved Chromium	50	< 10	--	--	--	--	--	--	--	< 10	--
Total Iron	300	**246**	< 100	< 100	< 100	< 100	**200**	**470**	**890**	**350**	**340**
Dissolved Iron	300	< 100	--	--	--	--	--	--	--	< 100	**150**
Total Manganese	300	< 10	--	--	--	--	--	--	--	**35**	--
Dissolved Manganese	300	< 10	--	--	--	--	--	--	--	**34**	--
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--

See notes on last page.

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. [(1)]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 3/7/2011	RW-3 4/8/2011	RW-3 5/2/2011	RW-3 6/8/2011	RW-3 7/8/2011	RW-3 8/1/2011	RW-3 9/6/2011	RW-3 10/3/2011	RW-3 11/11/2011	RW-3 12/19/2011
	NYSDEC SCGs										
Total Cadmium	5	--	--	--	--	--	--	--	--	< 5	--
Dissolved Cadmium	5	--	--	--	--	--	--	--	--	< 5	--
Total Chromium	50	--	--	--	--	--	--	--	--	< 10	--
Dissolved Chromium	50	--	--	--	--	--	--	--	--	< 10	--
Total Iron	300	**530**	**480**	**480**	**570**	**450**	**450**	**370**	**460**	**460**	**280**
Dissolved Iron	300	**200**	**200**	**130**	**140**	**120**	**120**	< 100	**110**	< 100	**200**
Total Manganese	300	--	--		--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

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. [(1)]

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 1/9/2012	RW-3 2/6/2012	RW-3 3/8/2012	RW-3 4/3/2012	RW-3 5/7/2012	RW-3 6/5/2012	RW-3 7/2/2012	RW-3 8/7/2012	RW-3 9/4/2012	RW-3 10/1/2012
	NYSDEC SCGs										
Total Cadmium	5	--	--	--	--	< 5	--	--	--	--	< 5
Dissolved Cadmium	5	--	--	--	--	< 5	--	--	--	--	< 5
Total Chromium	50	--	--	--	--	< 10	--	--	--	--	< 10
Dissolved Chromium	50	--	--	--	--	< 10	--	--	--	--	< 10
Total Iron	300	**500**	**410**	**980**	**310**	**400**	**140**	**250**	**310**	**140**	**280**
Dissolved Iron	300	**110**	100	**130**	**110**	< 100	**120**	**110**	**120**	< 100	< 100
Total Manganese	300	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

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. (1)

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-3 11/12/2012	RW-3 12/3/2012	RW-3 1/7/2013	RW-3 2/4/2013	RW-3 3/4/2013	RW-3 4/1/2013	RW-3 5/6/2013	RW-3 6/6/2013	RW-3 7/1/2013	RW-3 11/14/2013
	NYSDEC SCGs										
Total Cadmium	5	--	--	--	--	--	--	--	--	--	< 5.0
Dissolved Cadmium	5	--	--	--	--	--	--	--	--	--	< 5.0
Total Chromium	50	--	--	--	--	--	--	--	--	--	< 10
Dissolved Chromium	50	--	--	--	--	--	--	--	--	--	< 10
Total Iron	300	**220**	**210**	< 100	**290**	**130**	**230**	**330**	**280**	**180**	**280**
Dissolved Iron	300	**100**	< 100	< 100	**110**	**130**	**110**	< 100	**140**	<100	**150**
Total Manganese	300	--	--	--	--	--	--	--	--	--	--
Dissolved Manganese	300	--	--	--	--	--	--	--	--	--	--
Total Mercury	0.7	--	--	--	--	--	--	--	--	--	< 0.20
Dissolved Mercury	0.7	--	--	--	--	--	--	--	--	--	--

See notes on last page.

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. (1)

COMPOUND (ug/L)	Sample Location: / Sample Date:	RW-4 4/22/2009	RW-4 7/29/2009	RW-4 8/12/2009	RW-4 9/10/2009	RW-4 11/10/2009	RW-4 12/2/2009	RW-4 10/4/2010	RW-4 10/3/2011	RW-4 11/11/2011	RW-4 (2) 10/1/2012
	NYSDEC SCGs										
Total Cadmium	5	< 5	--	--	--	--	--	< 5	--	< 5	< 5
Dissolved Cadmium	5	< 5	--	--	--	--	--	< 5	--	< 5	< 5
Total Chromium	50	< 10	--	--	--	--	--	< 10	--	< 10	< 10
Dissolved Chromium	50	< 10	--	--	--	--	--	< 10	--	< 10	< 10
Total Iron	300	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Dissolved Iron	300	< 100	--	--	--	--	--	< 100	< 100	< 100	< 100
Total Manganese	300	**10.4**	--	--	--	--	--	**28**	--	--	--
Dissolved Manganese	300	< 10	--	--	--	--	--	**29**	--	--	--
Total Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--
Dissolved Mercury	0.7	< 0.2	--	--	--	--	--	--	--	--	--

See notes on last page.

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. (1)

COMPOUND (ug/L)	Sample Location: / Sample Date:	NYSDEC SCGs	RW-4 1/7/2013	RW-4 4/1/2013	RW-4 7/1/2013	RW-4 11/14/2013
Total Cadmium		5	--	--	--	< 5.0
Dissolved Cadmium		5	--	--	--	< 5.0
Total Chromium		50	--	--	--	< 10
Dissolved Chromium		50	--	--	--	< 10
Total Iron		300	--	--	--	< 100
Dissolved Iron		300	--	--	--	< 100
Total Manganese		300	--	--	--	--
Dissolved Manganese		300	--	--	--	--
Total Mercury		0.7	--	--	--	< 0.20
Dissolved Mercury		0.7	--	--	--	--

Notes:

(1) Water samples collected by ARCADIS on the dates shown and submitted to Columbia Analytical Services, Inc. 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 October of each year.

(3) Elevated RW-2 iron concentrations are believed attributed to multiple system shutdowns and re-starts due to a fouled pressure switch on March 2 and March 3, 2013. Turbulence dislodged accumulated iron deposits at the remedial well piping.

Acronyms/Key:

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

ARCADIS

Table 11. Summary of Water-Level Elevations, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Well Identification	Well Casing Elevation (ft msl)	Event Date	Baseline (1) 5/8/2009 (ft msl)	1Q2010 02/04/10 (ft msl)	2Q2010 04/23/10 (ft msl)	3Q2010 08/26/10 (ft msl)	4Q2010 12/10/10 (ft msl)	1Q2011 02/04/11 (ft msl)	2Q2011 05/20/11 (ft msl)	3Q2011 08/09/11 (ft msl)	4Q2011 10/26/11 (ft msl)	1Q2012 01/25/12 (ft msl)	2Q2012 05/02/12 (ft msl)	3Q2012 08/17/12 (ft msl)	4Q2012 10/05/12 (ft msl)	1Q2013 02/13/13 (ft msl)	2Q2013 05/13/13 (ft msl)	3Q2013 08/13/13 (ft msl)	4Q2013 11/01/13 (ft msl)
Recovery Wells																			
RW-1	125.18		69.75	70.67	74.38	72.52	71.11	70.96	72.13	70.44	72.72	73.15	72.12	71.71	71.21	70.35	70.89	71.62	69.31
RW-2	124.48		72.27	61.80	64.88	63.44	61.35	67.99	66.31	64.18	65.11	69.05	69.81	65.3	63.7	62.66	63.33	61.35	60.23
RW-3	122.84		69.40	67.64	71.4	69.44*	68.13	67.74	68.88	67.64	69.70	70.75	71.74	74.35(2)	68.06	68.01	68.73	72.29	67.11
RW-4	121.25		69.25	70.35	74.02	71.93	70.56	67.06	71.37	69.95	72.13	72.71	71.61	70.88	70.67	69.7	70.37	71.2	68.7
Monitoring Wells																			
B24MW-2	126.96		74.31	74.13	76.16	75.86	75.65	74.96	76.06	74.35	76.00	76.28	75.57	75.76	74.63	74.85	74.32	73.81	72.88
B24MW-3	127.11		72.63	72.16	75.87	74.10	72.89	72.40	74.04	72.27	74.44	74.63	73.67	73.62	72.69	72.2	72.41	73.14	68.24
B30MW-1	128.33		73.55	73.00	76.54	74.96	73.86	73.38	74.75	73.25	75.41	75.54	74.66	NM	73.66	73.11	73.28	73.97	72.26
BCPMW-1	125.73		73.16	72.67	76.26	74.66	73.43	72.94	74.75	72.94	75.05	75.23	74.29	74.22	73.27	NM	73.09	73.51	71.66
BCPMW-2	126.39		72.55	71.83	75.52	73.69	72.55	72.03	73.64	71.94	74.16	74.33	73.29	73.17	72.39	71.82	72.09	72.66	70.77
BCPMW-3	124.94		72.46	71.59	75.24	73.40	72.27	71.74	73.25	71.64	73.94	74.05	73.06	72.85	72.14	71.56	71.79	72.44	70.57
BCPMW-4-1	128.76		72.30	71.33	75.05	73.13	72.02	71.56	73.08	71.46	73.70	73.78	72.81	72.59	71.89	71.41	71.56	72.32	70.3
BCPMW-4-2	129.15		72.58	71.36	75.07	73.16	72.08	71.56	73.06	71.51	73.74	73.83	72.83	72.61	71.92	71.42	71.58	72.31	70.32
BCPMW-4-3	129.19		72.32	71.46	75.16	73.26	72.14	71.73	73.19	71.55	73.84	73.96	72.94	72.71	71.97	71.53	71.67	72.43	70.4
BCPMW-5-1	129.37		72.79	72.14	75.66	73.94	72.72	72.74	73.81	72.14	74.46	74.77	73.67	73.34	72.62	72.06	72.19	72.87	71.01
BCPMW-6-1	126.01		72.12	71.26	74.91	72.96	71.91	71.49	72.77	71.45	73.58	73.67	72.66	72.32	71.73	71.12	71.32	72.15	70.15
BCPMW-6-2	125.16		71.74	70.96	74.64	72.60	71.59	71.17	72.49	71.01	73.26	73.37	72.30	71.97	71.39	70.84	71.01	71.84	69.83
BCPMW-7-1	124.81		72.00	71.33	74.99	72.99	71.97	71.51	72.78	71.53	73.62	73.71	72.71	72.31	71.77	71.2	71.33	72.26	70.21
MW-200-1	123.49		72.16	71.37	75.07	73.14	72.08	71.72	72.98	71.52	73.69	73.83	72.76	72.59	71.91	71.34	71.53	72.31	70.37
MW-201-1	121.69		72.04	71.10	74.84	72.87	71.79	71.33	72.69	71.25	73.48	73.55	72.53	72.28	71.65	71.09	71.28	72.05	70.08
MW-202-1	119.27		71.90	71.13	74.83	72.82	71.77	71.32	72.66	71.21	73.46	73.57	73.51	72.23	71.6	70.98	71.23	--	70.06
MW-203-1	118.25		71.83	71.10	74.75	72.77	71.75	71.30	72.61	70.20	73.43	73.52	72.49	72.13	71.56	71.02	71.17	72.01	70.01
Piezometers																			
PZ-1a	128.82		72.56	71.15	74.87	72.94	71.85	71.33	72.76	71.31	73.54	73.62	72.63	72.42	71.72	71.23	71.39	--	--
PZ-1b	128.92		72.47	71.09	74.78	72.88	71.82	71.28	72.70	71.24	73.47	73.55	72.56	72.36	71.64	71.16	71.35	72.06	70.34
PZ-1c	128.96		72.47	71.48	75.15	73.23	72.13	71.74	73.16	71.56	73.83	73.9	72.90	72.68	71.94	71.46	71.63	72.39	70.39
PZ-2a	128.36		72.47	71.09	74.82	72.87	71.81	71.34	72.74	71.30	73.45	73.57	72.57	72.32	71.64	71.14	71.32	72.06	70.08
PZ-2b	128.37		72.43	71.08	74.77	72.86	71.78	71.30	72.68	71.27	73.45	73.55	72.54	72.28	71.61	71.13	71.29	72.05	70.08
PZ-2c	128.55		72.41	71.40	75.05	73.15	72.05	71.68	73.05	71.52	73.74	73.87	72.82	72.55	71.88	71.38	71.55	72.34	70.33
PZ-3	124.99		72.52	70.94	74.69	72.71	71.65	70.93	72.55	71.08	73.28	73.4	72.35	72.16	71.44	71.06	71.18	71.92	69.95
PZ-4	125.31		72.50	71.07	74.81	72.83	71.78	71.45	72.64	71.32	73.42	73.52	72.54	72.32	71.63	71.18	71.33	72.05	70.09
PZ-5a	129.07		72.50	71.94	75.61	73.79	72.59	72.17	73.70	71.98	74.27	74.39	73.40	73.25	72.45	71.94	72.16	72.84	70.85
PZ-5b	129.06		72.50	71.84	75.53	73.69	72.51	72.08	73.67	71.88	74.16	74.29	73.29	73.15	72.35	71.85	72.08	72.73	70.72
PZ-6a	125.67		72.50	71.03	74.73	72.84	71.70	71.24	72.56	71.24	73.37	73.46	72.43	72.13	71.5	70.95	71.17	71.91	69.94
PZ-6b	125.74		72.50	70.93	74.7	72.65	71.58	71.11	72.46	71.14	73.28	73.37	72.34	72.05	71.43	70.88	71.11	71.81	69.86
PZ-7a	125.10		72.50	71.32	75.02	73.00	72.00	71.54	72.80	71.58	73.67	73.7	72.72	72.36	71.78	71.2	71.35	72.26	70.26
PZ-7b	125.06		72.50	71.21	74.85	72.83	71.83	71.37	72.68	71.26	73.45	73.53	72.51	72.13	71.54	71.05	71.16	71.54	70.07

Notes and Abbreviations:
(1) Baseline readings were taken prior to system start-up, which occurred on July 21, 2009.
(2) Measurement collected is believed to be anomalous
*: RW-3 water level measurement collected on September 9, 2010.
ft msl: feet relative to mean sea level
NM: not measured

Table 12. Summary of Calculated Vertical Groundwater Hydraulic Gradients, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York.

Observation Well Pairing			10/5/2012			2/13/2013			5/13/2013			8/13/2013			11/1/2013		
Shallow	Deep	Vertical Distance Between Screens (ft)	Observed Head Shallow (ft msl)	Observed Head Deep (ft msl)	Vertical Hydraulic Gradient (1) (ft/ft)	Observed Head Shallow (ft msl)	Observed Head Deep (ft msl)	Vertical Hydraulic Gradient (1) (ft/ft)	Observed Head Shallow (ft msl)	Observed Head Deep (ft msl)	Vertical Hydraulic Gradient (1) (ft/ft)	Observed Head Shallow (ft msl)	Observed Head Deep (ft msl)	Vertical Hydraulic Gradient (1) (ft/ft)	Observed Head Shallow (ft msl)	Observed Head Deep (ft msl)	Vertical Hydraulic Gradient (1) (ft/ft)
PZ-1A	PZ-1B	20	71.72	71.64	-0.004	71.23	71.16	-0.0035	71.39	71.35	-0.002	--	72.06	--	--	70.34	--
PZ-1B	PZ-1C	50	71.64	71.94	0.006	71.16	71.46	0.006	71.35	71.63	0.0056	72.06	72.39	0.0066	70.34	70.39	0.001
PZ-2A	PZ-2B	20	71.64	71.61	-0.0015	71.14	71.13	-0.0005	71.32	71.29	-0.0015	72.06	72.05	-0.0005	70.08	70.08	0
PZ-2B	PZ-2C	50	71.61	71.88	0.0054	71.13	71.38	0.005	71.29	71.55	0.0052	72.05	72.34	0.0058	70.08	70.33	0.005
PZ-5A	PZ-5B	45	72.45	72.35	-0.0022	71.94	71.85	-0.002	72.16	72.08	-0.0018	72.84	72.73	-0.0024	70.85	70.72	-0.0029
PZ-6A	PZ-6B	25	71.50	71.43	-0.0028	70.95	70.88	-0.0028	71.17	71.11	-0.0024	71.91	71.81	-0.004	69.94	69.86	-0.0032
PZ-7A	PZ-7B	48	71.78	71.54	-0.005	71.20	71.05	-0.0031	71.35	71.16	-0.004	72.26	71.54	-0.015	70.26	70.07	-0.004
BCPMW-4-1	BCPMW-4-2	21	71.89	71.92	0.0014	71.41	71.42	0.0005	71.56	71.58	0.001	72.32	72.31	-0.0005	70.30	70.32	0.001
BCPMW-4-2	BCPMW-4-3	44	71.92	71.97	0.0011	71.42	71.53	0.0025	71.58	71.67	0.002	72.31	72.43	0.0027	70.32	70.40	0.0018
BCPMW-6-1	BCPMW-6-2	44.5	71.73	71.39	-0.0072	71.12	70.84	-0.0076	71.32	71.01	-0.0063	72.15	71.84	-0.007	70.15	69.83	-0.007

Notes:

1. Positive groundwater hydraulic gradient indicates a vertically upward gradient and a negative groundwater hydraulic gradient indicates vertically downward gradient.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	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*
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*
CFC-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**	***5.0***
Project VOCs (4)			**3.7**	**4.4**	**3.2**	**27**	***4.5***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	B24MW-3 4/20/2009	B24MW-3 10/6/2010	B24MW-3 10/27/2011	B24MW-3 10/4/2012	*B24MW-3 6/13/2013*
1,1,1-Trichloroethane		5	**0.62 J**	< 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 J	< 50	< 50	< 50	*< 50 J*
4-methyl-2-pentanone		50	< 50 J	< 50	< 50	< 50	*< 50 J*
Acetone		NE	< 50	< 50	< 50	< 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	< 5	*< 5.0 J*
Chloroethane		5	< 5	< 5	< 5	< 5	*< 5.0 J*
Chloroform		7	< 5	< 5	**0.32 J**	**0.38 J**	***1.3 J***
Chloromethane		5	< 5	< 5	< 5	< 5	*< 5.0 J*
cis-1,2-dichloroethene		5	**10**	**1.2 J**	**0.4 J**	**0.62 J**	*< 5.0 J*
cis-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	*< 5.0 J*
Dibromochloromethane		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-Butyl Ether		5	--	< 5	--	< 5	*< 5.0 J*
Methylene Chloride		5	< 5	< 5	< 5	< 5	*< 5.0 J*
Styrene		5	< 5	< 5	< 5	< 5	*< 5.0 J*
Tetrachloroethene		5	**0.51 J**	< 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	**45**	**5.9**	**1.4 J**	**1 J**	***0.44 J***
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	< 5	< 5	*< 5.0 J*
Vinyl Chloride		2	< 2	< 2	< 2	< 2	*< 2.0 J*
Xylene-o		5	< 5	< 5	< 5	< 5	*< 5.0 J*
Xylenes - m,p		5	< 5	< 5	< 5	< 5	*< 5.0 J*
Total VOCs (3)			**56**	**7.1**	**2.1**	**2.0**	***1.7***
Project VOCs (4)			**56**	**7.1**	**1.8**	**1.6**	***0.4***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	B30MW-1 4/23/2009	B30MW-1 10/4/2010	B30MW-1 10/27/2011	B30MW-1 10/3/2012	*B30MW-1 6/14/2013*
1,1,1-Trichloroethane		5	< 5	< 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	< 5	< 5	< 5	< 5	*< 5.0*
1,1-Dichloroethene		5	< 5	< 5	< 5	< 5	*< 5.0*
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 B	< 50 B	< 50	< 50	*< 50*
Benzene		1	< 0.7	< 0.7	< 0.7	< 0.7	*< 0.70*
Bromodichloromethane		50	< 5	< 5	< 5	< 5	*< 5.0*
Bromoform		50	< 5	< 5	< 5	< 5	*< 5.0*
Bromomethane		5	< 5	< 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*
Chlorodifluoromethane (Freon 22)		NE	< 5	< 5	< 5	< 5	*< 5.0*
Chloroethane		5	< 5	< 5	< 5	< 5	*< 5.0*
Chloroform		7	< 5	< 5	< 5	< 5	*< 5.0*
Chloromethane		5	< 5	< 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*
Dibromochloromethane		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-Butyl Ether		5	--	< 5	--	< 5	*< 5.0*
Methylene Chloride		5	< 5	< 5	< 5	< 5	*< 5.0*
Styrene		5	< 5	< 5	< 5	< 5	*< 5.0*
Tetrachloroethene		5	< 5	< 5	< 5	< 5	*< 5.0*
Toluene		5	< 5	< 5	< 5	< 5	*< 5.0*
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	< 5	< 5	< 5	< 5	*< 5.0*
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	< 5	< 5	*< 5.0*
Vinyl Chloride		2	< 2	< 2	< 2	< 2	*< 2.0*
Xylene-o		5	< 5	< 5	< 5	< 5	*< 5.0*
Xylenes - m,p		5	< 5	< 5	< 5	< 5	*< 5.0*
Total VOCs (3)			0	0	0	0	*0*
Project VOCs (4)			0	0	0	0	*0*

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	BCPMW-1 4/28/2009	BCPMW-2 4/28/2009	BCPMW-3 4/29/2009
1,1,1-Trichloroethane		5	< 5	< 10	< 25
1,1,2,2-Tetrachloroethane		5	< 5	< 10	< 25
1,1,2-Trichloroethane		1	< 5	< 10	< 25
1,1-Dichloroethane		5	**0.37 J**	**8 J**	**9.6 J**
1,1-Dichloroethene		5	< 5	**3.8 J**	**43**
1,2-Dichloroethane		0.6	< 5	**0.68 J**	< 25
1,2-Dichloropropane		1	< 5	< 10	< 25
2-Butanone		NE	< 50	< 100	< 250
2-Hexanone		50	< 50	< 100	< 250
4-methyl-2-pentanone		50	< 50	< 100	< 250
Acetone		NE	< 50 B	< 100	< 250
Benzene		1	< 0.7	< 1.4	< 3.5
Bromodichloromethane		50	< 5	< 10	< 25
Bromoform		50	< 5	< 10	< 25
Bromomethane		5	< 5	< 10	< 25
Carbon Disulfide		60	< 5	< 10	< 25
Carbon tetrachloride		5	< 5	< 10	< 25
Chlorobenzene		5	< 5	< 10	< 25
Chlorodifluoromethane (Freon 22)		NE	< 5	< 10	< 25
Chloroethane		5	< 5	< 10	< 25
Chloroform		7	**0.88 J**	< 10	< 25
Chloromethane		5	< 5	< 10	< 25
cis-1,2-dichloroethene		5	**22**	**310**	**900**
cis-1,3-dichloropropene		0.4	< 5	< 10	< 25
Dibromochloromethane		50	< 5	< 10	< 25
Dichlorodifluoromethane (Freon 12)		5	< 5	< 10	< 25
Ethylbenzene		5	< 5	< 10	< 25 B
Methyl tert-Butyl Ether		5	--	--	--
Methylene Chloride		5	**0.52 J**	< 10	< 25
Styrene		5	< 5	< 10	< 25
Tetrachloroethene		5	< 5	**1.5 J**	< 25
Toluene		5	**0.33 J**	< 10	< 25 B
trans-1,2-dichloroethene		5	**0.44 J**	**2.4 J**	**8.9 J**
trans-1,3-dichloropropene		0.4	< 5	< 10	< 25
Trichloroethene		5	**190**	**180**	**470**
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 10	< 25
Vinyl Chloride		2	< 2	**4.1**	**300**
Xylene-o		5	< 5	< 10	< 25 B
Xylenes - m,p		5	< 5	< 10	< 25 B
Total VOCs (3)			**220**	**510**	**1,700**
Project VOCs (4)			**210**	**510**	**1,700**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	BCPMW-4-1 4/17/2009	BCPMW-4-1 12/1/2009	BCPMW-4-1 10/4/2010	BCPMW-4-1 10/28/2011	BCPMW-4-1 10/3/2012
1,1,1-Trichloroethane		5	< 25	**2.4 J**	**14 J**	**10 J**	**29**
1,1,2,2-Tetrachloroethane		5	< 25	< 5	< 25	< 25	< 25
1,1,2-Trichloroethane		1	< 25	**0.38 J**	< 25	< 25	**1.7 J**
1,1-Dichloroethane		5	**6.5 J**	**46**	**38**	**18 J**	**39**
1,1-Dichloroethene		5	**1.8 J**	**14**	**21 J**	**13 J**	**24 J**
1,2-Dichloroethane		0.6	< 25	**0.65 J**	< 25	**2.1 J**	**4.8 J**
1,2-Dichloropropane		1	< 25	**4.7 J**	**3.8 J**	**1.9 J**	**5.1 J**
2-Butanone		NE	< 250	< 50	< 250	< 250	< 250
2-Hexanone		50	< 250 J	< 50	< 250	< 250	< 250
4-Methyl-2-Pentanone		50	< 250 J	< 50	< 250	< 250	< 250
Acetone		NE	< 250 J	< 50	< 250	< 250B	< 250
Benzene		1	< 3.5	**0.44 J**	< 3.5	< 3.5	< 3.5
Bromodichloromethane		50	< 25	< 5	< 25	< 25	< 25
Bromoform		50	< 25	< 5	< 25	< 25	< 25
Bromomethane		5	< 25	R	< 25	< 25	< 25
Carbon Disulfide		60	< 25	< 5	< 25	< 25	< 25
Carbon Tetrachloride		5	< 25	< 5	< 25	< 25	< 25
Chlorobenzene		5	< 25	< 5	< 25	< 25	< 25
Chlorodifluoromethane (Freon 22)		NE	**17 J**	**6.2**	**4.3 J**	**2.5 J**	< 25
Chloroethane		5	< 25	**2.4 J**	**4.1 J**	< 25	**1.6 J**
Chloroform		7	< 25	< 5	< 25	< 25	< 25
Chloromethane		5	< 25	R	< 25	< 25	< 25
cis-1,2-Dichloroethene		5	**1800 D**	**750 D**	**510**	**500**	**840**
cis-1,3-Dichloropropene		0.4	< 25	< 5	< 25	< 25	< 25
Chlorodibromomethane		50	< 25	< 5	< 25	< 25	< 25
CFC-12		5	< 25	< 5	< 25	< 25	< 25
Ethylbenzene		5	< 25	< 5	< 25	< 25	< 25
Methyl-Tert-Butylether		5	--	--	< 25	< 25	< 25
Methylene Chloride		5	< 25	< 5	< 25	< 25 B	< 25
Styrene (Monomer)		5	< 25	< 5	< 25	< 25	< 25
Tetrachloroethene		5	< 25	**0.64 J**	< 25	< 25	< 25
Toluene		5	< 25	< 5	< 25	< 25	< 25
trans-1,2-Dichloroethene		5	**110**	**2.5 J**	**3.9 J**	**1.3 J**	**2.2 J**
trans-1,3-Dichloropropene		0.4	< 25	< 5	< 25	< 25	< 25
Trichloroethene		5	**22 J**	**170**	**45**	**43**	**110**
Trichlorotrifluoroethane (Freon 113)		5	< 25	< 5	< 25	< 25	< 25
Vinyl Chloride		2	**180**	**540 D**	**220**	**32**	**420**
o-Xylene		5	< 25	**8**	< 25	< 25	< 25
m,p-Xylene		5	< 25	< 5	< 25	< 25	< 25
Total VOCs (3)			**2,100**	**1,500**	**860**	**620**	**1,500**
Project VOCs (4)			**2,100**	**1,500**	**850**	**620**	**1,500**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location:	*BCPMW-4-1*
	Sample Date:	*6/5/2013*
	NYSDEC SCGs	
1,1,1-Trichloroethane	5	***5.1***
1,1,2,2-Tetrachloroethane	5	*< 5.0*
1,1,2-Trichloroethane	1	***0.24 J***
1,1-Dichloroethane	5	***7.4***
1,1-Dichloroethene	5	***4.1 J***
1,2-Dichloroethane	0.6	***0.95 J***
1,2-Dichloropropane	1	***0.95 J***
2-Butanone	NE	*< 50*
2-Hexanone	50	*< 50*
4-Methyl-2-Pentanone	50	*< 50*
Acetone	NE	*< 50*
Benzene	1	*< 0.70*
Bromodichloromethane	50	*< 5.0*
Bromoform	50	*< 5.0*
Bromomethane	5	*< 5.0*
Carbon Disulfide	60	*< 5.0*
Carbon Tetrachloride	5	*< 5.0*
Chlorobenzene	5	*< 5.0*
Chlorodifluoromethane (Freon 22)	NE	***1.1 J***
Chloroethane	5	***0.46 J***
Chloroform	7	*< 5.0*
Chloromethane	5	*< 5.0*
cis-1,2-Dichloroethene	5	***310 D***
cis-1,3-Dichloropropene	0.4	*< 5.0*
Chlorodibromomethane	50	*< 5.0*
CFC-12	5	*< 5.0*
Ethylbenzene	5	*< 5.0*
Methyl-Tert-Butylether	5	*< 5.0*
Methylene Chloride	5	*< 5.0*
Styrene (Monomer)	5	*< 5.0*
Tetrachloroethene	5	***0.37 J***
Toluene	5	*< 5.0*
trans-1,2-Dichloroethene	5	***0.78 J***
trans-1,3-Dichloropropene	0.4	*< 5.0*
Trichloroethene	5	***16***
Trichlorotrifluoroethane (Freon 113)	5	*< 5.0*
Vinyl Chloride	2	***47***
o-Xylene	5	*< 5.0*
m,p-Xylene	5	*< 5.0*
Total VOCs (3)		***390***
Project VOCs (4)		***390***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	BCPMW-4-2 4/17/2009	BCPMW-4-2 12/4/2009	BCPMW-4-2 10/7/2010	BCPMW-4-2 10/28/2011	BCPMW-4-2 10/3/2012
1,1,1-Trichloroethane		5	< 250	< 10	< 5	**0.33 J**	**0.23 J**
1,1,2,2-Tetrachloroethane		5	< 250	< 10	< 5	< 5	< 5
1,1,2-Trichloroethane		1	< 250	< 10	< 5	< 5	< 5
1,1-Dichloroethane		5	**57 J**	**8.7 J**	**7.3**	**2.6 J**	**1.4 J**
1,1-Dichloroethene		5	**34 J**	**2.7 J**	**1.9 J**	**1.1 J**	**0.8 J**
1,2-Dichloroethane		0.6	< 250	< 10	**0.91 J**	**0.85 J**	**0.45 J**
1,2-Dichloropropane		1	< 250	< 10	**0.9 J**	**0.39 J**	< 5
2-Butanone		NE	< 2500	< 100	< 50	< 50	< 50
2-Hexanone		50	< 2500 J	< 100	< 50	< 50	< 50
4-methyl-2-pentanone		50	< 2500 J	< 100	< 50	< 50	< 50
Acetone		NE	< 2500 J	< 100	< 50 B	< 50	< 50
Benzene		1	< 35	< 1.4	< 0.7	< 0.7 U	< 0.7
Bromodichloromethane		50	< 250	< 10	< 5	< 5	< 5
Bromoform		50	< 250	< 10	< 5	< 5	< 5
Bromomethane		5	< 250	< 10	< 5	< 5	< 5
Carbon Disulfide		60	< 250	< 10	< 5	< 5	< 5
Carbon tetrachloride		5	< 250	< 10	< 5	< 5	< 5
Chlorobenzene		5	< 250	< 10	< 5	< 5	< 5
Chlorodifluoromethane (Freon 22)		NE	< 250	**0.8 J**	< 5	< 5	< 5
Chloroethane		5	< 250	**1.1 J**	**0.79 J**	< 5	< 5
Chloroform		7	< 250	< 10	**0.96 J**	**0.62 J**	**0.54 J**
Chloromethane		5	< 250	R	< 5	< 5	< 5
cis-1,2-dichloroethene		5	**18000 D**	**270**	**99**	**59**	**70**
cis-1,3-dichloropropene		0.4	< 250	< 10	< 5	< 5	< 5
Dibromochloromethane		50	< 250	< 10	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 250	< 10	< 5	< 5	< 5
Ethylbenzene		5	**62 J**	**0.78 J**	< 5	< 5	< 5
Methyl tert-Butyl Ether		5	**--**	**--**	**0.35 J**	**0.28 J**	**0.29 J**
Methylene Chloride		5	< 250	< 10	< 5	< 5	< 5
Styrene		5	< 250	< 10	< 5	< 5	< 5
Tetrachloroethene		5	< 250	**0.82 J**	**0.73 J**	**0.59 J**	**0.91 J**
Toluene		5	**2400**	< 10 B	< 5	< 5	< 5
trans-1,2-dichloroethene		5	< 250	**1.3 J**	**0.65 J**	**0.41 J**	**0.5 J**
trans-1,3-dichloropropene		0.4	< 250	< 10	< 5	< 5	< 5
Trichloroethene		5	< 250	**310**	**66**	**50**	**68**
Trichlorotrifluoroethane (Freon 113)		5	< 250	< 10	< 5	< 5	< 5
Vinyl Chloride		2	**6300**	**58**	**54**	**20**	**9.5**
Xylene-o		5	**110 J**	< 10 B	< 5	< 5	< 5
Xylenes - m,p		5	**190 J**	< 10 B	< 5	< 5	< 5
Total VOCs (3)			**27,000**	**660**	**230**	**140**	**150**
Project VOCs (4)			**27,000**	**650**	**230**	**130**	**150**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	*BCPMW-4-2* *6/5/2013*
1,1,1-Trichloroethane		5	***0.22 J***
1,1,2,2-Tetrachloroethane		5	*< 5.0*
1,1,2-Trichloroethane		1	*< 5.0*
1,1-Dichloroethane		5	***1.5 J***
1,1-Dichloroethene		5	***0.49 J***
1,2-Dichloroethane		0.6	***0.52 J***
1,2-Dichloropropane		1	*< 5.0*
2-Butanone		NE	*< 50*
2-Hexanone		50	*< 50*
4-methyl-2-pentanone		50	*< 50*
Acetone		NE	***1.8 J***
Benzene		1	*< 0.70*
Bromodichloromethane		50	*< 5.0*
Bromoform		50	*< 5.0*
Bromomethane		5	*< 5.0*
Carbon Disulfide		60	*< 5.0*
Carbon tetrachloride		5	*< 5.0*
Chlorobenzene		5	*< 5.0*
Chlorodifluoromethane (Freon 22)		NE	*< 5.0*
Chloroethane		5	*< 5.0*
Chloroform		7	***3.3 J***
Chloromethane		5	*< 5.0*
cis-1,2-dichloroethene		5	***47***
cis-1,3-dichloropropene		0.4	*< 5.0*
Dibromochloromethane		50	*< 5.0*
Dichlorodifluoromethane (Freon 12)		5	*< 5.0*
Ethylbenzene		5	*< 5.0*
Methyl tert-Butyl Ether		5	***0.26 J***
Methylene Chloride		5	*< 5.0*
Styrene		5	*< 5.0*
Tetrachloroethene		5	***0.63 J***
Toluene		5	*< 5.0*
trans-1,2-dichloroethene		5	***0.40 J***
trans-1,3-dichloropropene		0.4	*< 5.0*
Trichloroethene		5	***56***
Trichlorotrifluoroethane (Freon 113)		5	*< 5.0*
Vinyl Chloride		2	***9.7***
Xylene-o		5	*< 5.0*
Xylenes - m,p		5	*< 5.0*
Total VOCs (3)			***120***
Project VOCs (4)			***120***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	BCPMW-4-3 4/17/2009	BCPMW-4-3 12/1/2009	BCPMW-4-3 10/7/2010	BCPMW-4-3 10/28/2011	BCPMW-4-3 10/3/2012
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	< 5	< 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 J	< 50	< 50	< 50	< 50
4-methyl-2-pentanone		50	< 50 J	< 50	< 50	< 50	< 50
Acetone		NE	< 50 J	< 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	< 5	< 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	**0.53 J**	**0.32 J**	< 5	< 5	**0.2 J**
Chloromethane		5	< 5	R	< 5	< 5	< 5
cis-1,2-dichloroethene		5	**0.37 J**	< 5	< 5	< 5	< 5
cis-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane		50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether		5	--	--	< 5	< 5	< 5
Methylene Chloride		5	< 5	< 5	< 5	< 5	< 5
Styrene		5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		5	< 5	< 5	< 5	**0.27 J**	**0.3 J**
Toluene		5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene		5	**0.56 J**	**0.51 J**	**0.41 J**	**0.74 J**	**0.84 J**
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	< 5	**0.38 J**	< 5
Vinyl Chloride		2	< 2	< 2	< 2	< 2	< 2
Xylene-o		5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		5	< 5	< 5	< 5	< 5	< 5
Total VOCs (3)			**1.5**	**0.83**	**0.41**	**1.4**	**1.3**
Project VOCs (4)			**0.93**	**0.51**	**0.41**	**1.0**	**1.1**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

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

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

	Sample Location:	BCPMW-5-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1	BCPMW-6-1
Constituent in ug/L	Sample Date:	4/23/2009	4/20/2009	12/4/2009	10/6/2010	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
CFC-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)		**4,400**	**4,500**	**1,700**	**10,000**	**7,100**
Project VOCs (4)		**4,400**	**27**	**2.3**	0	0

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

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

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	BCPMW-6-2 5/8/2009	BCPMW-6-2 12/4/2009	BCPMW-6-2 10/6/2010	BCPMW-6-2 10/31/2011	BCPMW-6-2 10/3/2012
1,1,1-Trichloroethane		5	< 5	**0.78 J**	< 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	**0.37 J**	**0.65 J**	**0.47 J**	**0.41 J**	**0.23 J**
1,1-Dichloroethene		5	< 5	**0.44 J**	< 5	**0.3 J**	< 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	< 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	**0.64 J**
Chloroethane		5	< 5	< 5	< 5	< 5	< 5
Chloroform		7	**0.53 J**	< 5	**0.41 J**	**0.3 J**	**0.38 J**
Chloromethane		5	< 5	R	< 5	< 5	< 5
cis-1,2-Dichloroethene		5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Chlorodibromomethane		50	< 5	< 5	< 5	< 5	< 5
CFC-12		5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 5	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether		5	--	--	<5	**0.33 J**	**0.24 J**
Methylene Chloride		5	< 5	< 5	< 5	< 5	< 5
Styrene (Monomer)		5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		5	< 5	**0.79 J**	**2.1 J**	**1.8 J**	**1.6 J**
Toluene		5	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene		5	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene		5	< 5	**0.45 J**	< 5	< 5	< 5
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)			**0.90**	**3.1**	**3.0**	**3.1**	**3.1**
Project VOCs (4)			**0.37**	**3.1**	**2.6**	**2.5**	**1.8**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	*BCPMW-6-2* *6/5/2013*
1,1,1-Trichloroethane		5	*< 5.0*
1,1,2,2-Tetrachloroethane		5	*< 5.0*
1,1,2-Trichloroethane		1	*< 5.0*
1,1-Dichloroethane		5	***0.31 J***
1,1-Dichloroethene		5	*< 5.0 J*
1,2-Dichloroethane		0.6	*< 5.0*
1,2-Dichloropropane		1	*< 5.0*
2-Butanone		NE	*< 50*
2-Hexanone		50	*< 50*
4-Methyl-2-Pentanone		50	*< 50*
Acetone		NE	*< 50*
Benzene		1	*< 0.70 J*
Bromodichloromethane		50	*< 5.0*
Bromoform		50	*< 5.0*
Bromomethane		5	*< 5.0*
Carbon Disulfide		60	*< 5.0*
Carbon Tetrachloride		5	*< 5.0*
Chlorobenzene		5	*< 5.0 J*
Chlorodifluoromethane (Freon 22)		NE	*< 5.0*
Chloroethane		5	*< 5.0*
Chloroform		7	***0.93 J***
Chloromethane		5	*< 5.0*
cis-1,2-Dichloroethene		5	*< 5.0*
cis-1,3-Dichloropropene		0.4	*< 5.0*
Chlorodibromomethane		50	*< 5.0*
CFC-12		5	*< 5.0*
Ethylbenzene		5	*< 5.0*
Methyl-Tert-Butylether		5	***0.36 J***
Methylene Chloride		5	*< 5.0*
Styrene (Monomer)		5	*< 5.0*
Tetrachloroethene		5	***1.3 J***
Toluene		5	*< 5.0 J*
trans-1,2-Dichloroethene		5	*< 5.0*
trans-1,3-Dichloropropene		0.4	*< 5.0*
Trichloroethene		5	*< 5.0 J*
Trichlorotrifluoroethane (Freon 113)		5	*< 5.0*
Vinyl Chloride		2	*< 2.0*
o-Xylene		5	*< 5.0*
m,p-Xylene		5	*< 5.0*
Total VOCs (3)			***2.9***
Project VOCs (4)			***1.6***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	BCPMW-7-1 4/20/2009	BCPMW-7-1 12/1/2009	BCPMW-7-1 10/7/2010	BCPMW-7-1 11/1/2011	BCPMW-7-1 10/4/2012
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	< 5	< 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 J	< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone		50	< 50 J	< 50	< 50	< 50	< 50
Acetone		NE	< 50	< 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	**2.6 J**	**1.5 J**	**5.2**	**9.2**	**3.6 J**
Chloroethane		5	< 5	< 5	< 5	< 5	< 5
Chloroform		7	< 5	< 5	< 5	< 5	**0.37 J**
Chloromethane		5	< 5	R	< 5	< 5	< 5
cis-1,2-Dichloroethene		5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Chlorodibromomethane		50	< 5	< 5	< 5	< 5	< 5
CFC-12		5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 5	< 5	< 5	< 5	< 5
Methyl-Tert-Butylether		5	--	--	< 5	**0.22 J**	**0.26 J**
Methylene Chloride		5	< 5	< 5	< 5	< 5	< 5
Styrene (Monomer)		5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		5	< 5	< 5	< 5	< 5	< 5
Toluene		5	< 5	< 5	< 5	< 5	< 5
trans-1,2-Dichloroethene		5	< 5	< 5	< 5	< 5	< 5
trans-1,3-Dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene		5	< 5	< 5	< 5	< 5	< 5
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)			**2.6**	**1.5**	**5.2**	**9.4**	**4.2**
Project VOCs (4)			0.0	0.0	0.0	**0.2**	0.0

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	*BCPMW-7-1* *6/7/2013*
1,1,1-Trichloroethane		5	*< 5.0*
1,1,2,2-Tetrachloroethane		5	*< 5.0*
1,1,2-Trichloroethane		1	*< 5.0*
1,1-Dichloroethane		5	*< 5.0*
1,1-Dichloroethene		5	*< 5.0*
1,2-Dichloroethane		0.6	*< 5.0*
1,2-Dichloropropane		1	*< 5.0*
2-Butanone		NE	*< 50*
2-Hexanone		50	*< 50*
4-methyl-2-pentanone		50	*< 50*
Acetone		NE	*< 50*
Benzene		1	*< 0.70*
Bromodichloromethane		50	*< 5.0*
Bromoform		50	*< 5.0*
Bromomethane		5	*< 5.0*
Carbon Disulfide		60	*< 5.0*
Carbon tetrachloride		5	*< 5.0*
Chlorobenzene		5	*< 5.0*
Chlorodifluoromethane (Freon 22)		NE	***2.5 J***
Chloroethane		5	*< 5.0*
Chloroform		7	***0.29 J***
Chloromethane		5	*< 5.0*
cis-1,2-dichloroethene		5	*< 5.0*
cis-1,3-dichloropropene		0.4	*< 5.0*
Dibromochloromethane		50	*< 5.0*
Dichlorodifluoromethane (Freon 12)		5	*< 5.0*
Ethylbenzene		5	*< 5.0*
Methyl tert-Butyl Ether		5	***0.22 J***
Methylene Chloride		5	*< 5.0*
Styrene		5	*< 5.0*
Tetrachloroethene		5	*< 5.0*
Toluene		5	*< 5.0*
trans-1,2-dichloroethene		5	*< 5.0*
trans-1,3-dichloropropene		0.4	*< 5.0*
Trichloroethene		5	*< 5.0*
Trichlorotrifluoroethane (Freon 113)		5	*< 5.0*
Vinyl Chloride		2	*< 2.0*
Xylene-o		5	*< 5.0*
Xylenes - m,p		5	*< 5.0*
Total VOCs (3)			***3.0***
Project VOCs (4)			*0*

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	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
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
Dibromochloromethane		50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether		5	--	--	< 5	< 5	< 5
Methylene Chloride		5	< 5	< 5	< 5	< 5	< 5
Styrene		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
Xylene-o		5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		5	< 5	< 5	< 5	< 5	< 5
Total VOCs (3)			**76**	**20**	**11**	**32**	**5.3**
Project VOCs (4)			**74**	**18**	**11**	**31**	**5.3**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	MW-200-1 5/31/2013
1,1,1-Trichloroethane		5	*< 5.0*
1,1,2,2-Tetrachloroethane		5	*< 5.0*
1,1,2-Trichloroethane		1	*< 5.0*
1,1-Dichloroethane		5	*< 5.0*
1,1-Dichloroethene		5	*< 5.0*
1,2-Dichloroethane		0.6	*< 5.0*
1,2-Dichloropropane		1	*< 5.0*
2-Butanone		NE	*< 50*
2-Hexanone		50	*< 50*
4-methyl-2-pentanone		50	*< 50*
Acetone		NE	*< 50*
Benzene		1	*< 0.70*
Bromodichloromethane		50	*< 5.0*
Bromoform		50	*< 5.0*
Bromomethane		5	*< 5.0*
Carbon Disulfide		60	*< 5.0*
Carbon tetrachloride		5	*< 5.0*
Chlorobenzene		5	*< 5.0*
Chlorodifluoromethane (Freon 22)		NE	*< 5.0*
Chloroethane		5	*< 5.0*
Chloroform		7	*< 5.0*
Chloromethane		5	*< 5.0*
cis-1,2-dichloroethene		5	***0.41 J***
cis-1,3-dichloropropene		0.4	*< 5.0*
Dibromochloromethane		50	*< 5.0*
Dichlorodifluoromethane (Freon 12)		5	*< 5.0*
Ethylbenzene		5	*< 5.0*
Methyl tert-Butyl Ether		5	*< 5.0*
Methylene Chloride		5	*< 5.0*
Styrene		5	*< 5.0*
Tetrachloroethene		5	*< 5.0*
Toluene		5	*< 5.0*
trans-1,2-dichloroethene		5	*< 5.0*
trans-1,3-dichloropropene		0.4	*< 5.0*
Trichloroethene		5	***1.3 J***
Trichlorotrifluoroethane (Freon 113)		5	*< 5.0*
Vinyl Chloride		2	*< 2.0*
Xylene-o		5	*< 5.0*
Xylenes - m,p		5	*< 5.0*
Total VOCs (3)			***1.7***
Project VOCs (4)			***1.7***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	MW-201-1 5/1/2009	MW-201-1 12/2/2009	MW-201-1 10/5/2010	MW-201-1 11/3/2011	MW-201-1 10/4/2012
1,1,1-Trichloroethane		5	**5.5 J**	**3.3 J**	< 50	< 5	< 5
1,1,2,2-Tetrachloroethane		5	< 25	< 50	< 50	< 5	< 5
1,1,2-Trichloroethane		1	< 25	< 50	< 50	< 5	< 5
1,1-Dichloroethane		5	**10 J**	**9 J**	**14 J**	**0.51 J**	**1.2 J**
1,1-Dichloroethene		5	**7.9 J**	**8.1 J**	**6.9 J**	**0.21 J**	**0.65 J**
1,2-Dichloroethane		0.6	< 25	< 50	< 50	< 5	< 5
1,2-Dichloropropane		1	< 25	< 50	< 50	< 5	< 5
2-Butanone		NE	< 250	< 500	< 500	< 50	< 50
2-Hexanone		50	< 250	< 500	< 500	< 50	< 50
4-methyl-2-pentanone		50	< 250	< 500	< 500	< 50	< 50
Acetone		NE	< 250 B	< 500	< 500	< 50	< 50
Benzene		1	< 3.5	< 7	< 7	< 0.7	< 0.7
Bromodichloromethane		50	< 25	< 50	< 50	< 5	< 5
Bromoform		50	< 25	< 50	< 50	< 5	< 5
Bromomethane		5	< 25	< 50	< 50	< 5	< 5
Carbon Disulfide		60	< 25	< 50	< 50	< 5	< 5
Carbon tetrachloride		5	< 25	< 50	< 50	< 5	< 5
Chlorobenzene		5	< 25	< 50	< 50	< 5	< 5
Chlorodifluoromethane (Freon 22)		NE	< 25	< 50	< 50	< 5	< 5
Chloroethane		5	< 25	< 50	< 50	< 5	< 5
Chloroform		7	< 25	< 50	**4.2 J**	**3.2 J**	**2.9 J**
Chloromethane		5	< 25	R	< 50	< 5	< 5
cis-1,2-dichloroethene		5	**970 D**	**1300**	**3900 D**	**61**	**180 D**
cis-1,3-dichloropropene		0.4	< 25	< 50	< 50	< 5	< 5
Dibromochloromethane		50	< 25	< 50	< 50	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 25	< 50	< 50	< 5	< 5
Ethylbenzene		5	< 25	< 50	< 50	< 5	< 5
Methyl tert-Butyl Ether		5	--	--	<50	**0.75 J**	**0.22 J**
Methylene Chloride		5	< 25	< 50	< 50	< 5	< 5
Styrene		5	< 25	< 50	< 50	< 5	< 5
Tetrachloroethene		5	< 25	< 50	< 50	**0.24 J**	**0.24 J**
Toluene		5	< 25	< 50	< 50	< 5 J	< 5
trans-1,2-dichloroethene		5	**2.7 J**	**3.5 J**	**6.7 J**	< 5	**0.59 J**
trans-1,3-dichloropropene		0.4	< 25	< 50	< 50	< 5	< 5
Trichloroethene		5	**160**	**230**	**72**	**20**	**20**
Trichlorotrifluoroethane (Freon 113)		5	< 25	< 50	< 50 U	< 5	< 5
Vinyl Chloride		2	< 10	**38**	**820**	< 2 U	**13**
Xylene-o		5	< 25	< 50	**7.2 J**	< 5	< 5
Xylenes - m,p		5	< 25	< 50	< 50	< 5	< 5
Total VOCs (3)			**1,200**	**1,600**	**4,800**	**86**	**220**
Project VOCs (4)			**1,200**	**1,600**	**4,800**	**82**	**220**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	*MW-201-1* *5/31/2013*
1,1,1-Trichloroethane		5	*< 5.0*
1,1,2,2-Tetrachloroethane		5	*< 5.0*
1,1,2-Trichloroethane		1	*< 5.0*
1,1-Dichloroethane		5	*< 5.0*
1,1-Dichloroethene		5	*< 5.0*
1,2-Dichloroethane		0.6	*< 5.0*
1,2-Dichloropropane		1	*< 5.0*
2-Butanone		NE	*< 50*
2-Hexanone		50	*< 50*
4-methyl-2-pentanone		50	*< 50*
Acetone		NE	*< 50*
Benzene		1	*< 0.70*
Bromodichloromethane		50	*< 5.0*
Bromoform		50	*< 5.0*
Bromomethane		5	*< 5.0*
Carbon Disulfide		60	*< 5.0*
Carbon tetrachloride		5	*< 5.0*
Chlorobenzene		5	*< 5.0*
Chlorodifluoromethane (Freon 22)		NE	*< 5.0*
Chloroethane		5	*< 5.0*
Chloroform		7	***0.49 J***
Chloromethane		5	*< 5.0*
cis-1,2-dichloroethene		5	***7.9***
cis-1,3-dichloropropene		0.4	*< 5.0*
Dibromochloromethane		50	*< 5.0*
Dichlorodifluoromethane (Freon 12)		5	*< 5.0*
Ethylbenzene		5	*< 5.0*
Methyl tert-Butyl Ether		5	*< 5.0*
Methylene Chloride		5	*< 5.0*
Styrene		5	*< 5.0*
Tetrachloroethene		5	*< 5.0*
Toluene		5	*< 5.0*
trans-1,2-dichloroethene		5	*< 5.0*
trans-1,3-dichloropropene		0.4	*< 5.0*
Trichloroethene		5	***13***
Trichlorotrifluoroethane (Freon 113)		5	*< 5.0*
Vinyl Chloride		2	*< 2.0*
Xylene-o		5	*< 5.0*
Xylenes - m,p		5	*< 5.0*
Total VOCs (3)			***21***
Project VOCs (4)			***21***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	MW-202-1 5/1/2009	MW-202-1 12/2/2009	MW-202-1 10/6/2010	MW-202-1 11/3/2011	MW-202-1 10/4/2012
1,1,1-Trichloroethane		5	< 5	< 5	< 5	**0.32 J**	**0.74 J**
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	< 5	< 5	< 5	**0.86 J**	**2.1 J**
1,1-Dichloroethene		5	< 5	< 5	< 5	**0.72 J**	**1.9 J**
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	< 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	< 5	< 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	**0.61 J**	**0.21 J**	< 5
Chloroethane		5	< 5	< 5	< 5	< 5	< 5
Chloroform		7	**6.2**	**6.7**	**0.93 J**	< 5	< 5
Chloromethane		5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		5	**0.64 J**	**0.58 J**	< 5	< 5	**0.4 J**
cis-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane		50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether		5	--	--	< 5	**0.37 J**	< 5
Methylene Chloride		5	< 5	< 5	< 5	< 5	< 5
Styrene		5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		5	< 5	< 5	**0.48 J**	**0.92 J**	**1.7 J**
Toluene		5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene		5	**7.5**	**9.3**	**2.4 J**	**0.78 J**	**1.2 J**
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	**0.43 J**	**0.44 J**	**0.76 J**
Vinyl Chloride		2	< 2	< 2	< 2	< 2	< 2
Xylene-o		5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		5	< 5	< 5	< 5	< 5	< 5
Total VOCs (3)			**14**	**17**	**4.9**	**4.6**	**8.8**
Project VOCs (4)			**8.1**	**9.9**	**2.9**	**3.6**	**8.0**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	*MW-202-1* *5/30/2013*
1,1,1-Trichloroethane		5	***0.93 J***
1,1,2,2-Tetrachloroethane		5	*< 5.0*
1,1,2-Trichloroethane		1	*< 5.0*
1,1-Dichloroethane		5	***3.0 J***
1,1-Dichloroethene		5	***2.3 J***
1,2-Dichloroethane		0.6	*< 5.0*
1,2-Dichloropropane		1	*< 5.0*
2-Butanone		NE	*< 50*
2-Hexanone		50	*< 50*
4-methyl-2-pentanone		50	*< 50*
Acetone		NE	*< 50*
Benzene		1	*< 0.70*
Bromodichloromethane		50	*< 5.0*
Bromoform		50	*< 5.0*
Bromomethane		5	*< 5.0*
Carbon Disulfide		60	*< 5.0*
Carbon tetrachloride		5	*< 5.0*
Chlorobenzene		5	*< 5.0*
Chlorodifluoromethane (Freon 22)		NE	*< 5.0*
Chloroethane		5	*< 5.0*
Chloroform		7	*< 5.0*
Chloromethane		5	*< 5.0*
cis-1,2-dichloroethene		5	***0.63 J***
cis-1,3-dichloropropene		0.4	*< 5.0*
Dibromochloromethane		50	*< 5.0*
Dichlorodifluoromethane (Freon 12)		5	*< 5.0*
Ethylbenzene		5	*< 5.0*
Methyl tert-Butyl Ether		5	*< 5.0*
Methylene Chloride		5	*< 5.0*
Styrene		5	*< 5.0*
Tetrachloroethene		5	***2.8 J***
Toluene		5	*< 5.0*
trans-1,2-dichloroethene		5	*< 5.0*
trans-1,3-dichloropropene		0.4	*< 5.0*
Trichloroethene		5	***1.6 J***
Trichlorotrifluoroethane (Freon 113)		5	***1.4 J***
Vinyl Chloride		2	*< 2.0*
Xylene-o		5	*< 5.0*
Xylenes - m,p		5	*< 5.0*
Total VOCs (3)			***13***
Project VOCs (4)			***11***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	MW-203-1 5/1/2009	MW-203-1 12/2/2009	MW-203-1 10/5/2010	MW-203-1 11/1/2011	MW-203-1 10/3/2012
1,1,1-Trichloroethane		5	< 5	< 5	< 5	< 5	**0.26 J**
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	< 5	< 5	< 5	**0.32 J**	**1 J**
1,1-Dichloroethene		5	< 5	< 5	< 5	< 5	**0.44 J**
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 B	< 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	< 5	< 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	**73**	**17**	**29**	**8.9**	**3.6 J**
Chloroethane		5	< 5	< 5	< 5	< 5	< 5
Chloroform		7	**7.9**	**2.6 J**	**1.5 J**	**0.68 J**	**0.36 J**
Chloromethane		5	< 5	< 5	< 5	< 5	< 5
cis-1,2-dichloroethene		5	**1.6 J**	**0.83 J**	**0.97 J**	**1.4 J**	**0.62 J**
cis-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane		50	< 5	< 5	< 5	< 5	< 5
Dichlorodifluoromethane (Freon 12)		5	< 5	< 5	< 5	< 5	< 5
Ethylbenzene		5	< 5	< 5	< 5	< 5	< 5
Methyl tert-Butyl Ether		5	--	--	**0.88 J**	**0.41 J**	**0.21 J**
Methylene Chloride		5	< 5	< 5	< 5	< 5	< 5
Styrene		5	< 5	< 5	< 5	< 5	< 5
Tetrachloroethene		5	< 5	< 5	< 5	**0.35 J**	**0.59 J**
Toluene		5	< 5	< 5	< 5	< 5	< 5
trans-1,2-dichloroethene		5	< 5	< 5	< 5	< 5	< 5
trans-1,3-dichloropropene		0.4	< 5	< 5	< 5	< 5	< 5
Trichloroethene		5	**1.3 J**	**0.7 J**	**1.6 J**	**2.9 J**	**1.8 J**
Trichlorotrifluoroethane (Freon 113)		5	< 5	< 5	< 5	< 5	**1.1 J**
Vinyl Chloride		2	< 2	< 2	< 2	< 2	< 2
Xylene-o		5	< 5	< 5	< 5	< 5	< 5
Xylenes - m,p		5	< 5	< 5	< 5	< 5	< 5
Total VOCs (3)			**84**	**21**	**34**	**15**	**10**
Project VOCs (4)			**2.9**	**1.5**	**2.6**	**5**	**4.7**

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

	Sample Location:	*MW-203-1 (REP)*	*MW-203-1*
Constituent in ug/L	Sample Date:	*5/31/2013*	*5/31/2013*
	NYSDEC SCGs		
1,1,1-Trichloroethane	5	*< 5.0*	***0.25 J***
1,1,2,2-Tetrachloroethane	5	*< 5.0*	*< 5.0*
1,1,2-Trichloroethane	1	*< 5.0*	*< 5.0*
1,1-Dichloroethane	5	***0.98 J***	***1.1 J***
1,1-Dichloroethene	5	***0.47 J***	***0.46 J***
1,2-Dichloroethane	0.6	*< 5.0*	*< 5.0*
1,2-Dichloropropane	1	*< 5.0*	*< 5.0*
2-Butanone	NE	*< 50*	*< 50*
2-Hexanone	50	*< 50*	*< 50*
4-methyl-2-pentanone	50	*< 50*	*< 50*
Acetone	NE	*< 50*	*< 50*
Benzene	1	*< 0.70*	*< 0.70*
Bromodichloromethane	50	*< 5.0*	*< 5.0*
Bromoform	50	*< 5.0*	*< 5.0*
Bromomethane	5	*< 5.0*	*< 5.0*
Carbon Disulfide	60	*< 5.0*	*< 5.0*
Carbon tetrachloride	5	*< 5.0*	*< 5.0*
Chlorobenzene	5	*< 5.0*	*< 5.0*
Chlorodifluoromethane (Freon 22)	NE	***3.5 J***	***3.2 J***
Chloroethane	5	*< 5.0*	*< 5.0*
Chloroform	7	***0.28 J***	***0.27 J***
Chloromethane	5	*< 5.0*	*< 5.0*
cis-1,2-dichloroethene	5	***0.39 J***	***0.24 J***
cis-1,3-dichloropropene	0.4	*< 5.0*	*< 5.0*
Dibromochloromethane	50	*< 5.0*	*< 5.0*
Dichlorodifluoromethane (Freon 12)	5	*< 5.0*	*< 5.0*
Ethylbenzene	5	*< 5.0*	*< 5.0*
Methyl tert-Butyl Ether	5	***0.24 J***	***0.24 J***
Methylene Chloride	5	*< 5.0*	*< 5.0*
Styrene	5	*< 5.0*	*< 5.0*
Tetrachloroethene	5	***0.93 J***	***1.1 J***
Toluene	5	*< 5.0*	*< 5.0*
trans-1,2-dichloroethene	5	*< 5.0*	*< 5.0*
trans-1,3-dichloropropene	0.4	*< 5.0*	*< 5.0*
Trichloroethene	5	***2.5 J***	***2.7 J***
Trichlorotrifluoroethane (Freon 113)	5	***1.1 J***	***1.4 J***
Vinyl Chloride	2	*< 2.0*	*< 2.0*
Xylene-o	5	*< 5.0*	*< 5.0*
Xylenes - m,p	5	*< 5.0*	*< 5.0*
Total VOCs (3)		***10***	***11***
Project VOCs (4)		***5.3***	***5.9***

See notes on last page.

Table 13. Concentrations of Volatile Organic Compounds in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1,2]

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.

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

(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.

TVOCs were rounded to two significant figures.

Indicates an exceedance of an SCG.

Bold value indicates a detection.

Italicized samples collected in 2013.

RI/FS	Remedial Investigation/Feasibility Study.
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.
ug/L	Micrograms per liter.
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.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

Constituent in ug/L	Sample Location: / Sample Date:	NYSDEC SCGs	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
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	**2,080**	**103**	--	--
Iron (dissolved)		300	--	< 100	--	< 100	**1,760**	< 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 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

COMPOUND (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-4-2 4/17/2009	BCPMW-4-2 10/7/2010	BCPMW-4-2 10/28/2011	BCPMW-4-2 10/3/2012	BCPMW-4-2 10/4/2012	*BCPMW-4-2 6/5/2013*
	NYSDEC SCGs									
Cadmium (total)	5	*< 5*	--	*< 5.0*	< 5	< 5	< 5	< 5	--	*< 5.0*
Cadmium (dissolved)	5	--	< 5	*< 5.0*	< 5	--	< 5	--	< 5	*< 5.0*
Chromium (total)	50	***32***	--	***16.1***	**10.6**	< 10	< 10	< 10	--	*< 10*
Chromium (dissolved)	50	--	**26**	***13.1***	< 10	--	< 10	--	< 10	*< 10*
Iron (total)	300	--	--	--	**4,630**	--	--	--	--	--
Iron (dissolved)	300	--	--	--	**4,080**	--	--	--	--	--
Manganese (total)	300	--	--	--	**228**	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	**217**	--	--	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

COMPOUND (ug/L)	Sample Location: / Sample Date:	BCPMW-4-3 4/17/2009	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*
	NYSDEC SCGs							
Cadmium (total)	5	< 5	< 5	< 5	*< 5*	--	*< 5.0*	*< 5.0*
Cadmium (dissolved)	5	< 5	< 5	< 5	--	< 5	*< 5.0*	*< 5.0*
Chromium (total)	50	< 10	< 10	< 10	*< 10*	--	*< 10*	*< 10*
Chromium (dissolved)	50	< 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 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

COMPOUND (ug/L)	Sample Location: / Sample Date:	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	*BCPMW-6-1 6/7/2013*	BCPMW-6-2 5/8/2009
	NYSDEC SCGs								
Cadmium (total)	5	< 5	< 5	<5	< 5	< 5	--	*< 5.0*	< 5
Cadmium (dissolved)	5	< 5	< 5	<5	< 5	--	< 5	*< 5.0*	< 5
Chromium (total)	50	< 10	< 10	< 10	**14**	< 10	--	*< 10*	**10.3**
Chromium (dissolved)	50	< 10	< 10	<10	< 10	--	< 10	*< 10*	< 10
Iron (total)	300	**7,420**	< 100	--	--	--	--	--	--
Iron (dissolved)	300	**6,370**	< 100	--	--	--	--	--	--
Manganese (total)	300	**145**	< 10	--	--	--	--	--	--
Manganese (dissolved)	300	**131**	< 10	--	--	--	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

COMPOUND (ug/L)	Sample Location: / Sample Date:	BCPMW-6-2 10/6/2010	BCPMW-6-2 10/31/2011	BCPMW-6-2 10/3/2012	BCPMW-6-2 10/4/2012	*BCPMW-6-2 6/5/2013*	BCPMW-7-1 4/20/2009	BCPMW-7-1 10/7/2010	BCPMW-7-1 11/1/2011	BCPMW-7-1 10/4/2012
	NYSDEC SCGs									
Cadmium (total)	5	<5	<5	< 5	--	*< 5.0*	< 5	< 5	< 5	< 5
Cadmium (dissolved)	5	<5	<5		< 5	*< 5.0*	< 5	< 5	< 5	< 5
Chromium (total)	50	<10	<10	< 10	--	*< 10*	< 10	< 10	< 10	< 10
Chromium (dissolved)	50	<10	<10		< 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 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

COMPOUND (ug/L)	Sample Location: / Sample Date:	*BCPMW-7-1* *6/7/2013*	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*	MW-201-1 5/1/2009	MW-201-1 10/5/2010
	NYSDEC SCGs									
Cadmium (total)	5	< *5.0*	< 5	< 5	< 5	< 5	--	< *5*	< 5	< 5
Cadmium (dissolved)	5	< *5.0*	< 5	< 5	< 5	< 5	--	< *5*	< 5	< 5
Chromium (total)	50	< *10*	< 10	**14**	**48**	**1,130**	**86**	***15.7***	< 10	< 10
Chromium (dissolved)	50	< *10*	< 10	< 10	**13**	**320**	**21**	< *10*	< 10	< 10
Iron (total)	300	--	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--	--

See notes on last page.

Table 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

COMPOUND (ug/L)	Sample Location: / Sample Date:	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*	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	< 5	< 5	--	*< 5*	< 5	< 5	< 5	< 5	--	*< 5*
Cadmium (dissolved)	5	< 5	< 5	--	*< 5*	< 5	< 5	< 5	< 5	--	*< 5*
Chromium (total)	50	< 10	**159**	**28**	*< 10*	**16.5**	**15**	**23**	**263 J**	**19**	***34.3***
Chromium (dissolved)	50	< 10	**42**	**17**	*< 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 14. Concentrations of Metals in Groundwater Samples Collected from Monitoring Wells, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2)

COMPOUND (ug/L)	Sample Location: Sample Date:	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	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*
	NYSDEC SCGs								
Cadmium (total)	5	< 5	< 5	< 5	< 5	--	--	*< 5*	*< 5*
Cadmium (dissolved)	5	< 5	< 5	< 5	--	< 5	--	*< 5*	*< 5*
Chromium (total)	50	**31.5**	**31**	**37**	**1,600**	--	**155**	***38.2***	***29.5***
Chromium (dissolved)	50	< 10	< 10	< 10	--	**84**	<10	*< 10*	*< 10*
Iron (total)	300	--	--	--	--	--	--	--	--
Iron (dissolved)	300	--	--	--	--	--	--	--	--
Manganese (total)	300	--	--	--	--	--	--	--	--
Manganese (dissolved)	300	--	--	--	--	--	--	--	--

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 samples collected in 2013.

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.

ARCADIS

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

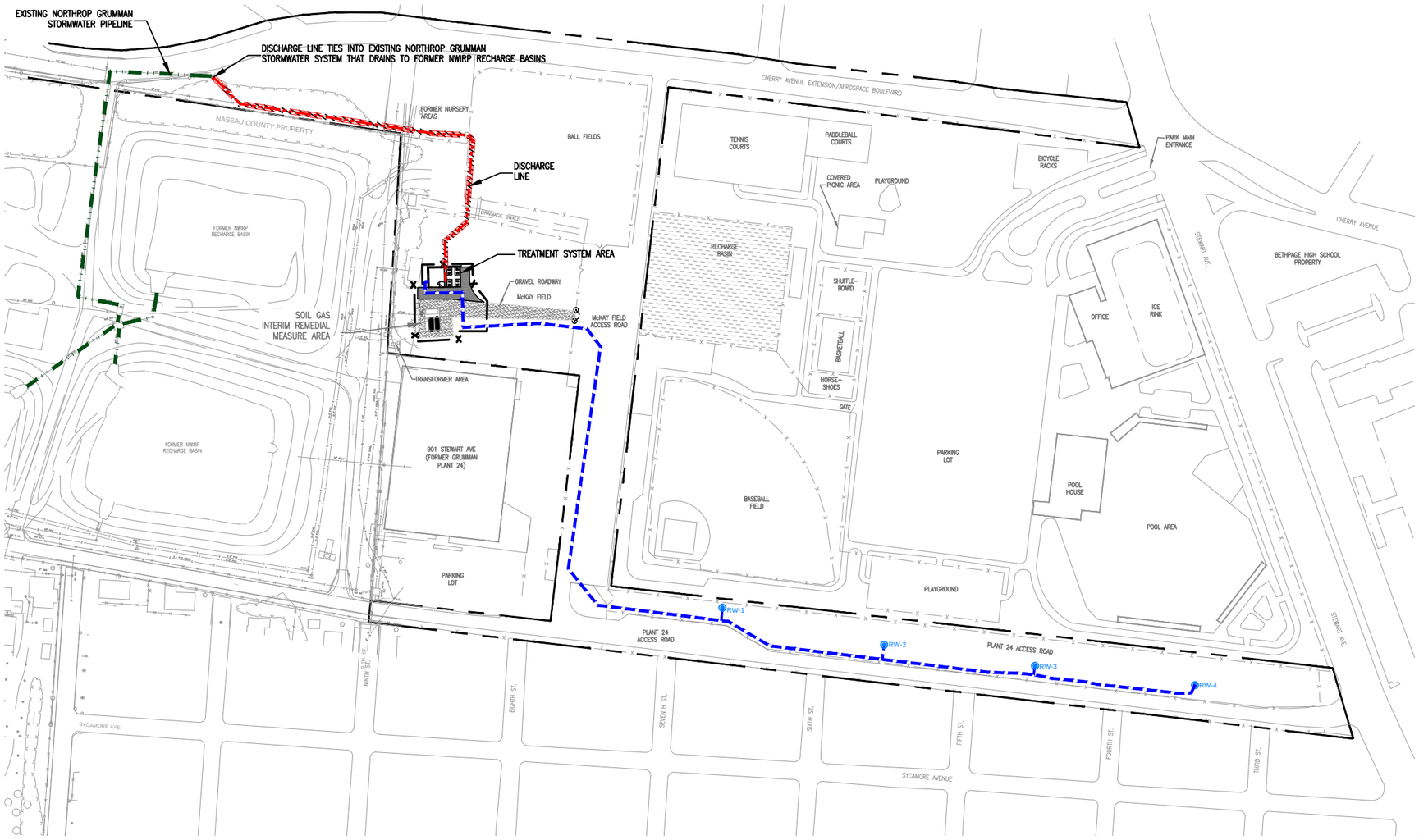
0 2000' 4000'
SCALE IN FEET

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

SITE LOCATION

ARCADIS

FIGURE
1



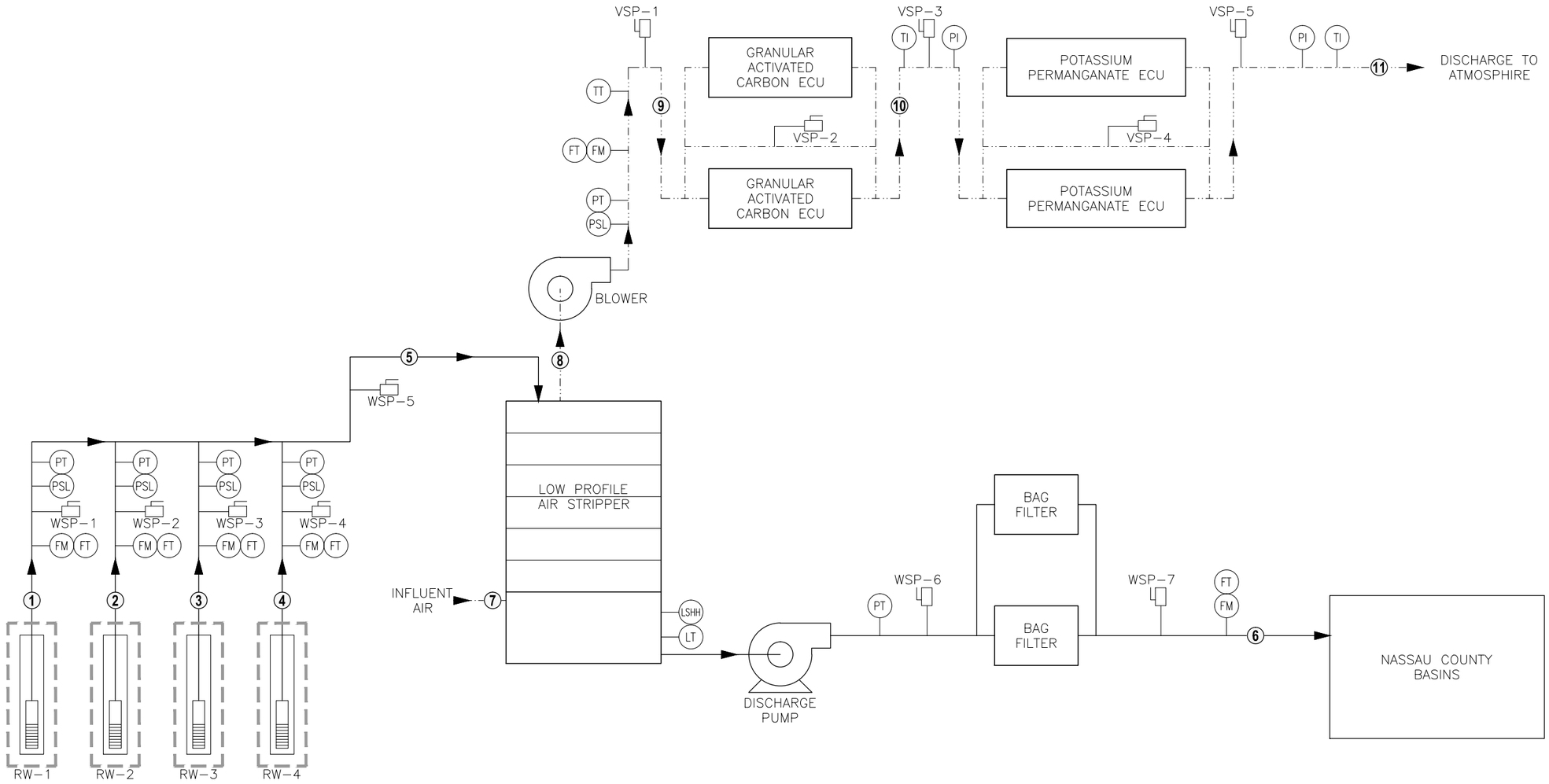
BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

SITE AND GROUNDWATER CONTAINMENT SYSTEM

ARCADIS

FIGURE
2

CITY:MELVILLE DIV/GROUP:ENR1 DB:ALS LD: PIC: PM:CSG TM: LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\NY001496\0312\GWM\4\OU3\NY1496_B02.dwg LAYOUT: 2 SAVED: 3/27/2014 4:27 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/27/2014 4:31 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: NY001464.1807.00003



PROCESS	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
Mass Loading (lbs/day)											
Trichloroethene	0.009	0.041	0.082	0.008	0.140	<0.008	0.000	0.140	0.140	<0.014	<0.014
cis -1,2 Dichloroethene	0.007	1.877	0.431	0.030	2.346	<0.008	0.000	2.346	2.346	<0.235	<0.235
Vinyl Chloride	0.000	0.443	0.001	0.000	0.444	<0.003	0.000	0.444	0.444	0.444	<0.044
Flow Rate (gpm)	40	85	85	40	250	250	---	---	---	---	---
Flow Rate (CFM)	---	---	---	---	---	---	1,300 - 1,600	1,300	1,535	1,557	1,581
Pressure (feet of water)	10	10	10	10	8	15	---	---	---	---	---
Pressure (inches of water)	---	---	---	---	---	---	0	- 28 to - 38	12	6	0
pH	6.4	6.4	6.4	6.4	6.4	6.2	---	---	---	---	---
Temperature	55	55	55	55	55	55	10	55	97	95	95
Relative Humidity	---	---	---	---	---	---	20 - 80	100	<50	<50	<50

LEGEND:

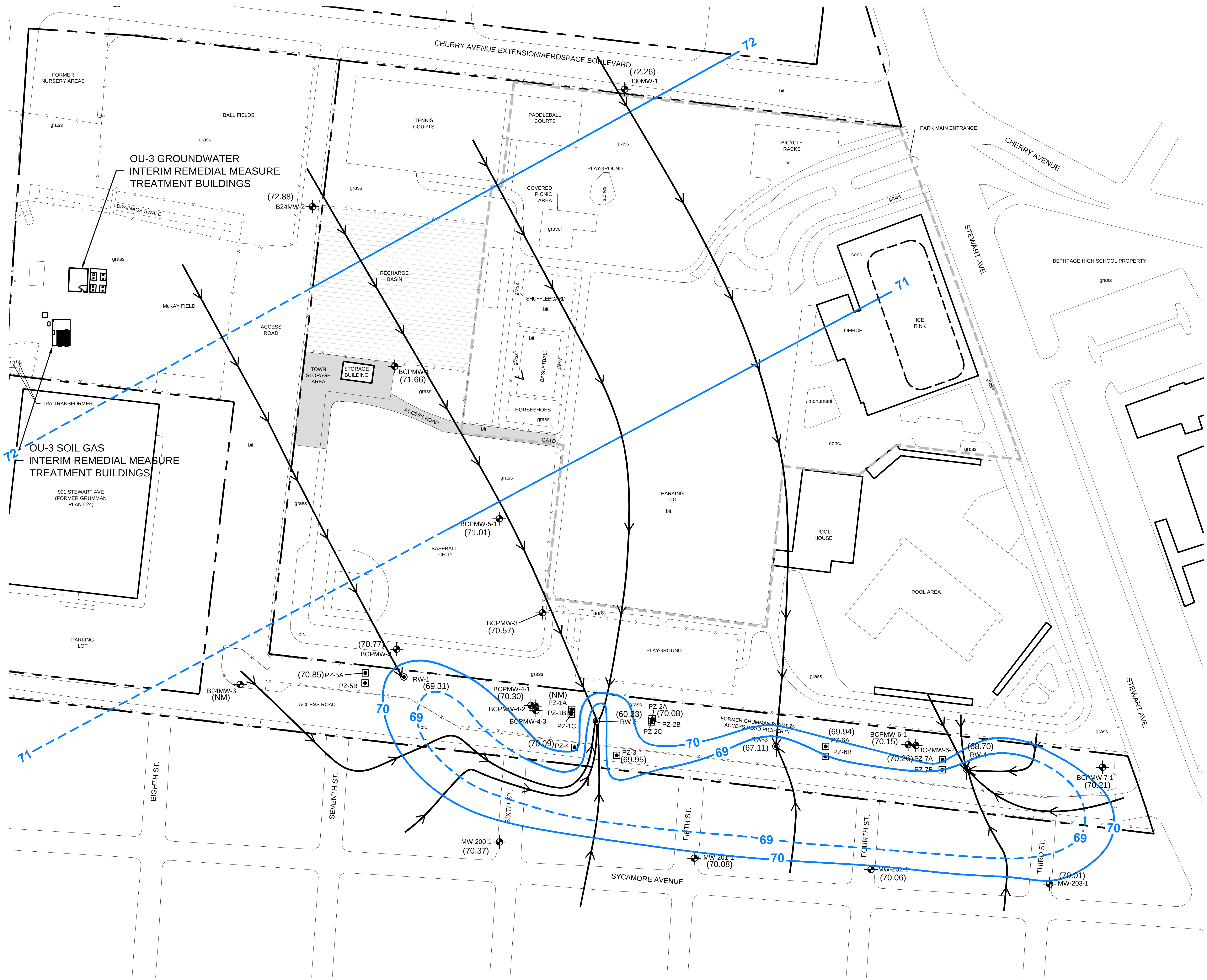
- PROCESS WATER
- PROCESS AIR
- FM INSTRUMENT
- SAMPLE PORT
- FLOW DIRECTION
- FM FLOW METER
- FT FLOW RATE TRANSMITTER
- PSL PRESSURE VACUUM LOW
- PT PRESSURE TRANSMITTER
- PI PRESSURE INDICATOR
- LSHH LEVEL SWITCH HIGH HIGH
- LT LEVEL TRANSMITTER
- TT TEMPERATURE TRANSMITTER
- TI TEMPERATURE INDICATOR
- ⑧ PROCESS DESIGNATION
- WSP WATER SAMPLE PORT
- VSP VAPOR SAMPLE PORT

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

GROUNDWATER TREATMENT SYSTEM PROCESS SCHEMATIC, PROCESS FLOW DIAGRAM, AND MONITORING LOCATIONS

ARCADIS

FIGURE 3



EXPLANATION:

—·—·—	NORTHROP GRUMMAN PROPERTY LINE
—x—x—	FENCE
	BASIN
bit.	BITUMINOUS PAVEMENT
MW-200-1	MONITORING WELL
RW-2	REMEDIAL WELL
PZ-2C	PIEZOMETER
(71.92)	WATER-LEVEL ELEVATION (FEET MEAN SEA LEVEL)
(NM)	NOT MEASURED
70	GROUNDWATER ELEVATION CONTOUR IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE LESS CONTROL AVAILABLE)
→	DIRECTION OF HORIZONTAL COMPONENT OF GROUNDWATER FLOW

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.
3. WATER LEVEL ELEVATIONS CALCULATED FROM DATA COLLECTED ON NOVEMBER 1, 2013.
4. B24MW-3 AND PZ-1A COULD NOT BE ACCESSED, THEREFORE, WATER LEVELS WERE NOT MEASURED.

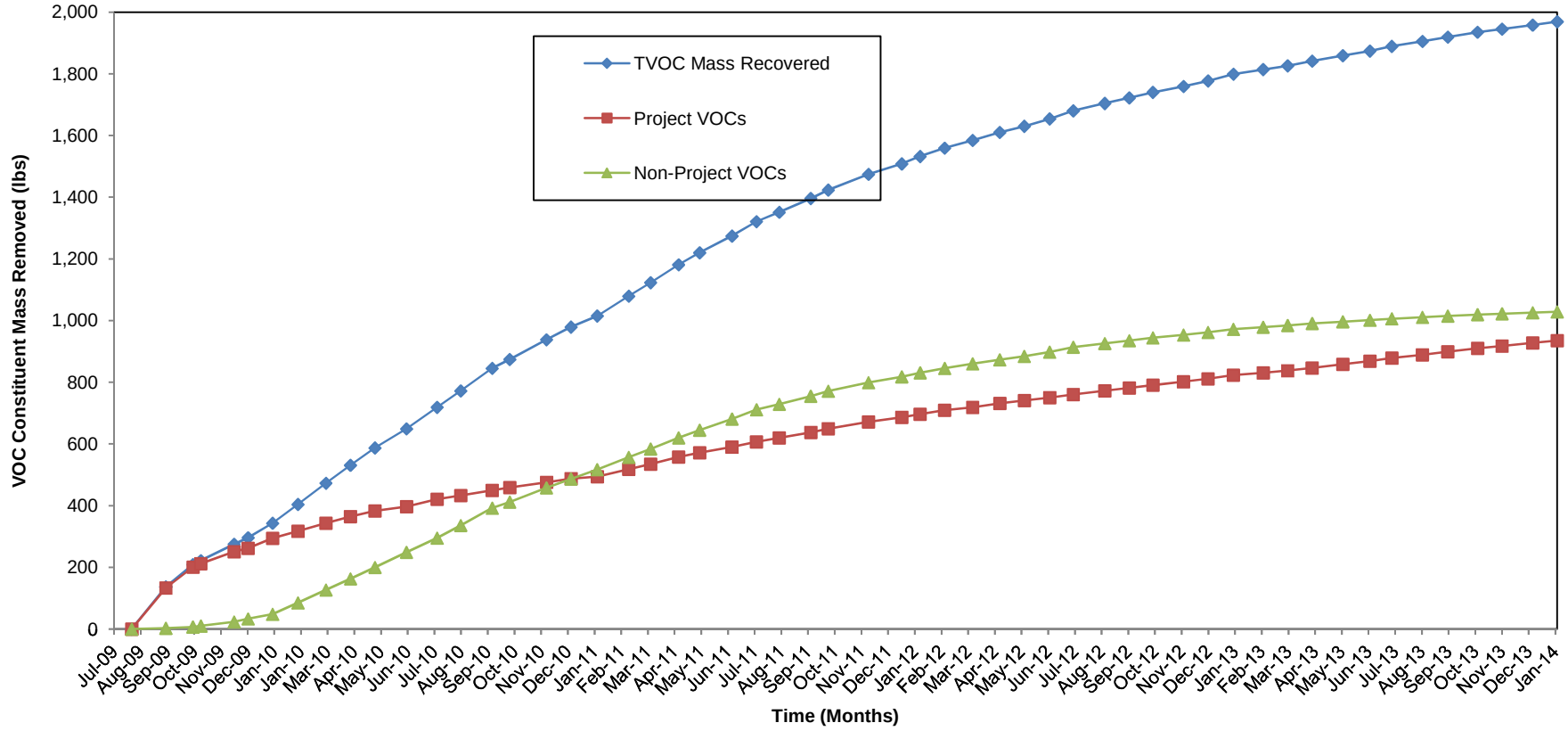
0 100' 200'
SCALE IN FEET

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

GROUNDWATER MONITORING NETWORK AND CONFIGURATION OF THE SHALLOW POTENTOMETRIC SURFACE AND GROUNDWATER FLOW DIRECTIONS FOURTH QUARTER 2013

ARCADIS

FIGURE
4



Notes:

VOC = Volatile organic compound.

lbs = Pounds.

Total VOCs = 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.

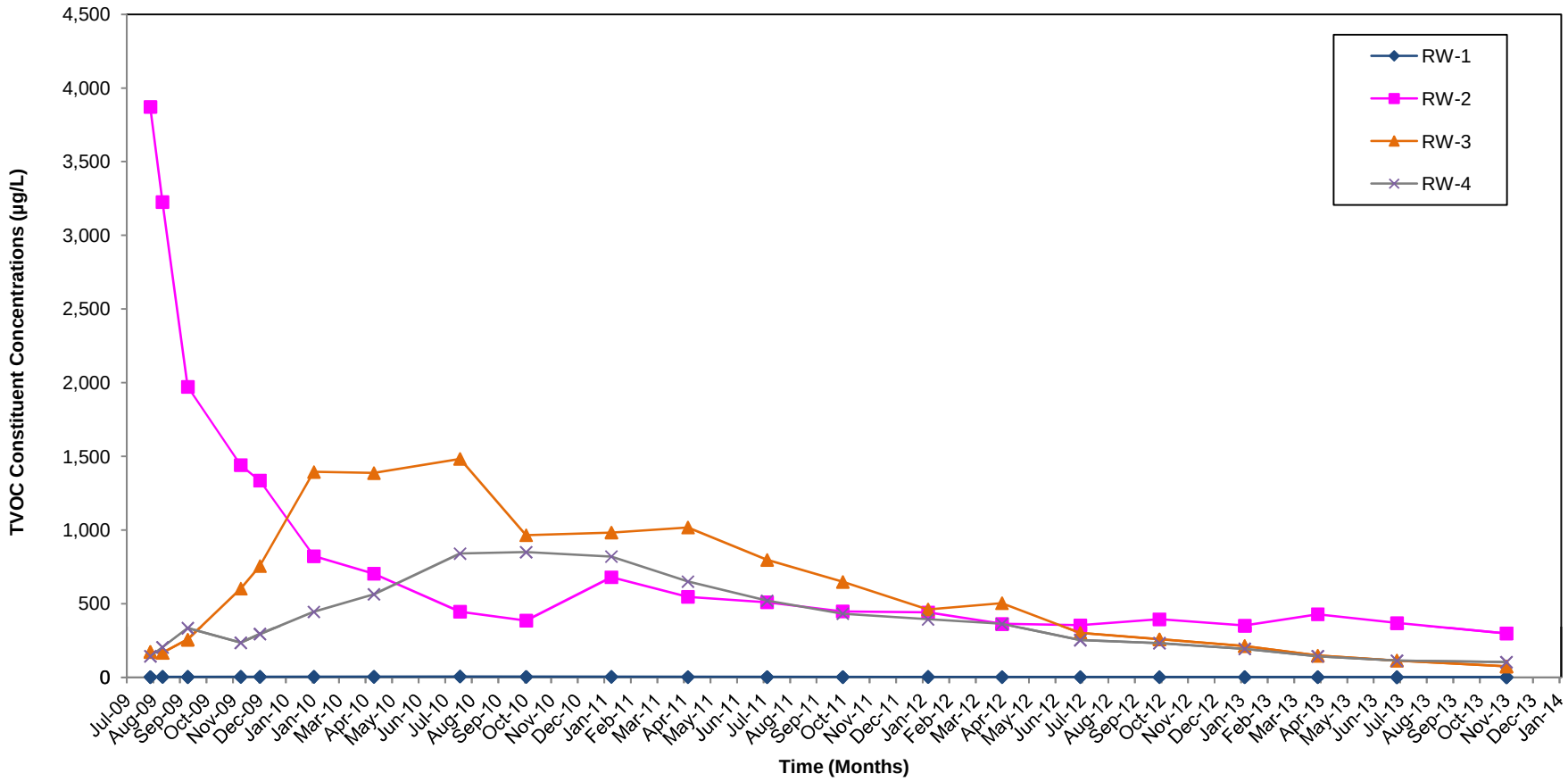
Non-Project VOCs = Sum of Total VOCs that are not Project VOCs.

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 2013

ARCADIS

FIGURE 5



Notes:

VOC = Volatile organic compound.

µg/L = Micrograms per liter.

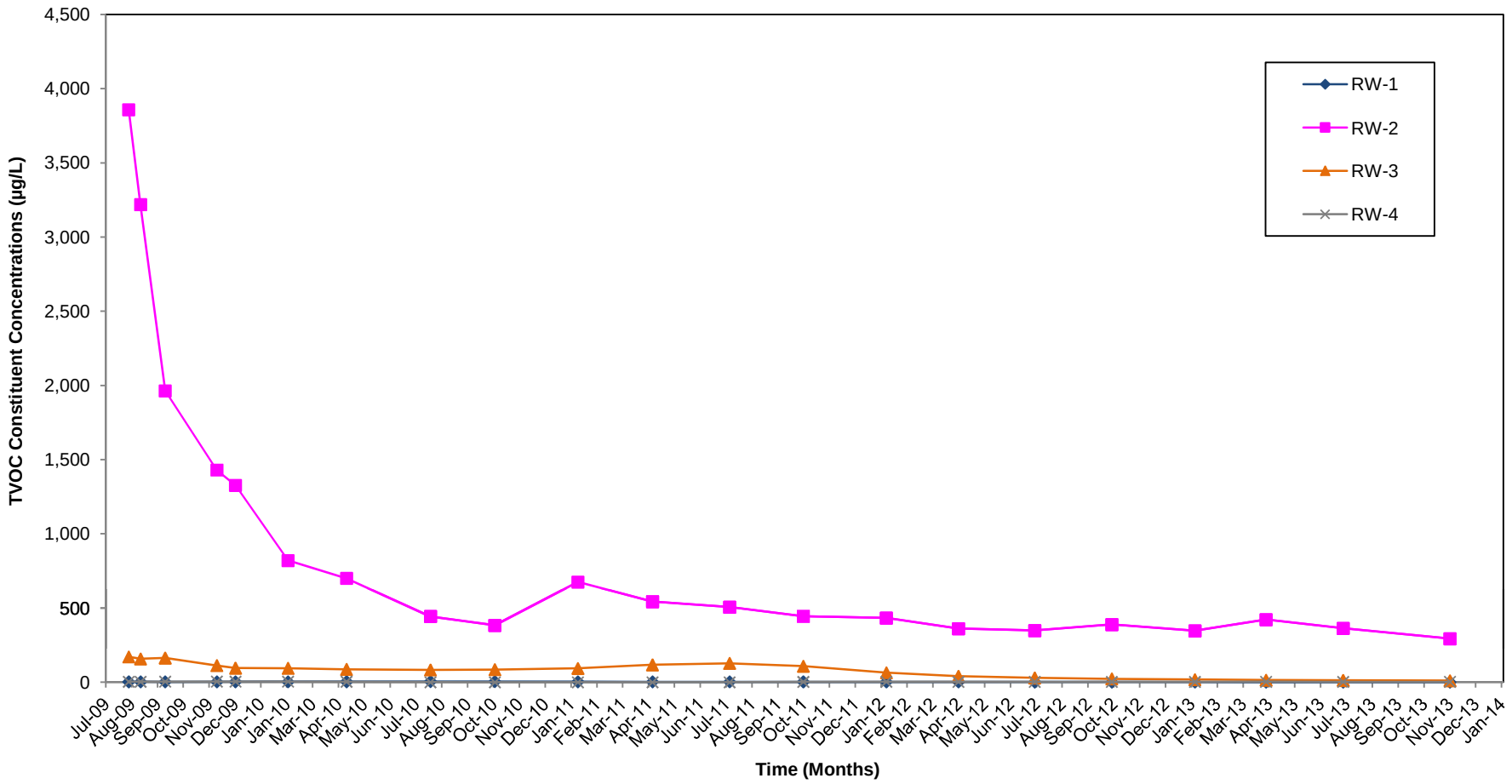
Total VOCs = Sum of VOCs detected.

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

REMEDIAL WELL TOTAL VOC CONCENTRATIONS THROUGH DECEMBER 2013

ARCADIS

FIGURE 6A



Notes:
VOC = Volatile organic compound.

µg/L = Micrograms per liter.

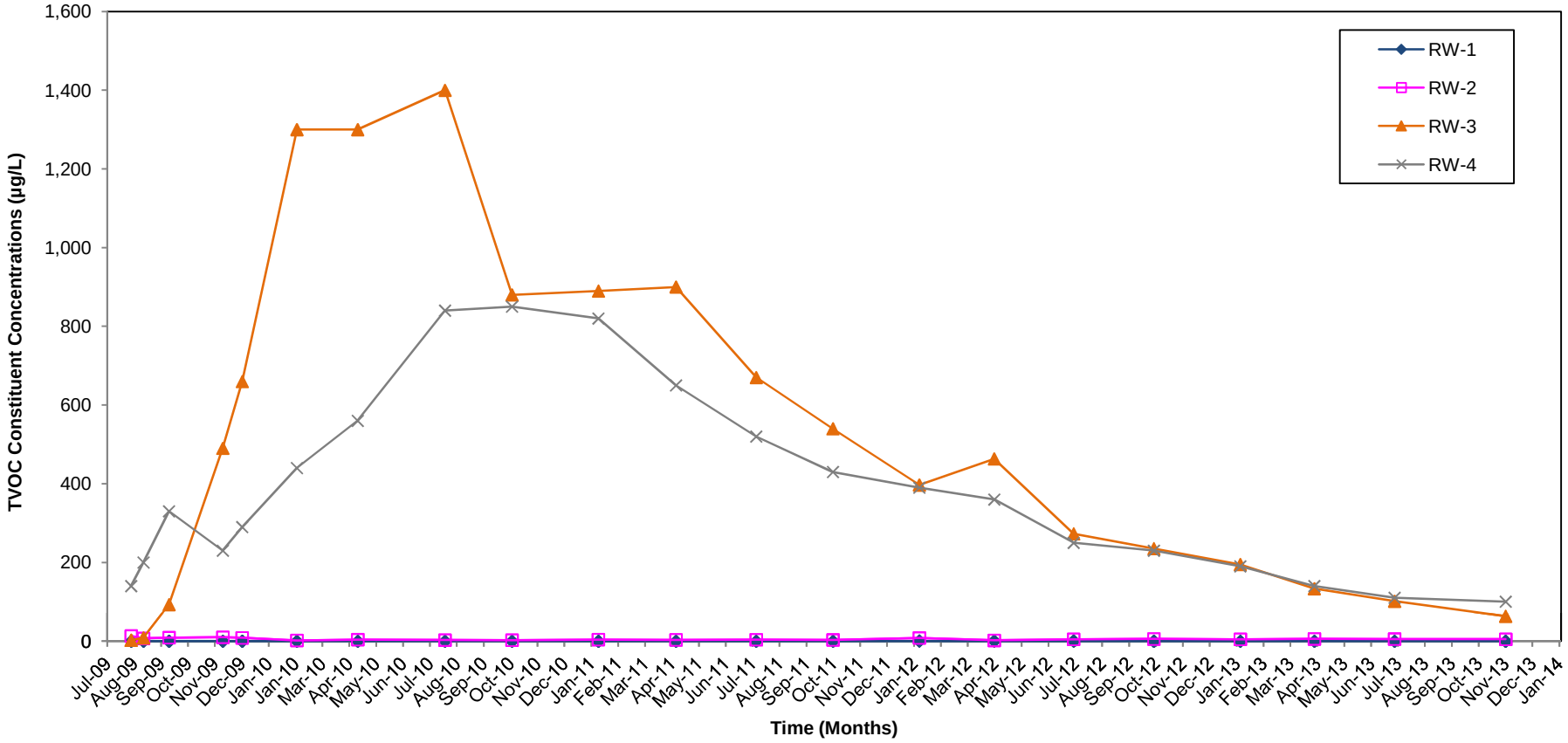
Project VOCs = Sum of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2- Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethene; Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene: and Total Xylenes.

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

REMEDIAL WELL PROJECT VOC CONCENTRATIONS THROUGH DECEMBER 2013

ARCADIS

FIGURE 6B



Notes:
VOC = Volatile organic compound.

µg/L = Micrograms per liter.

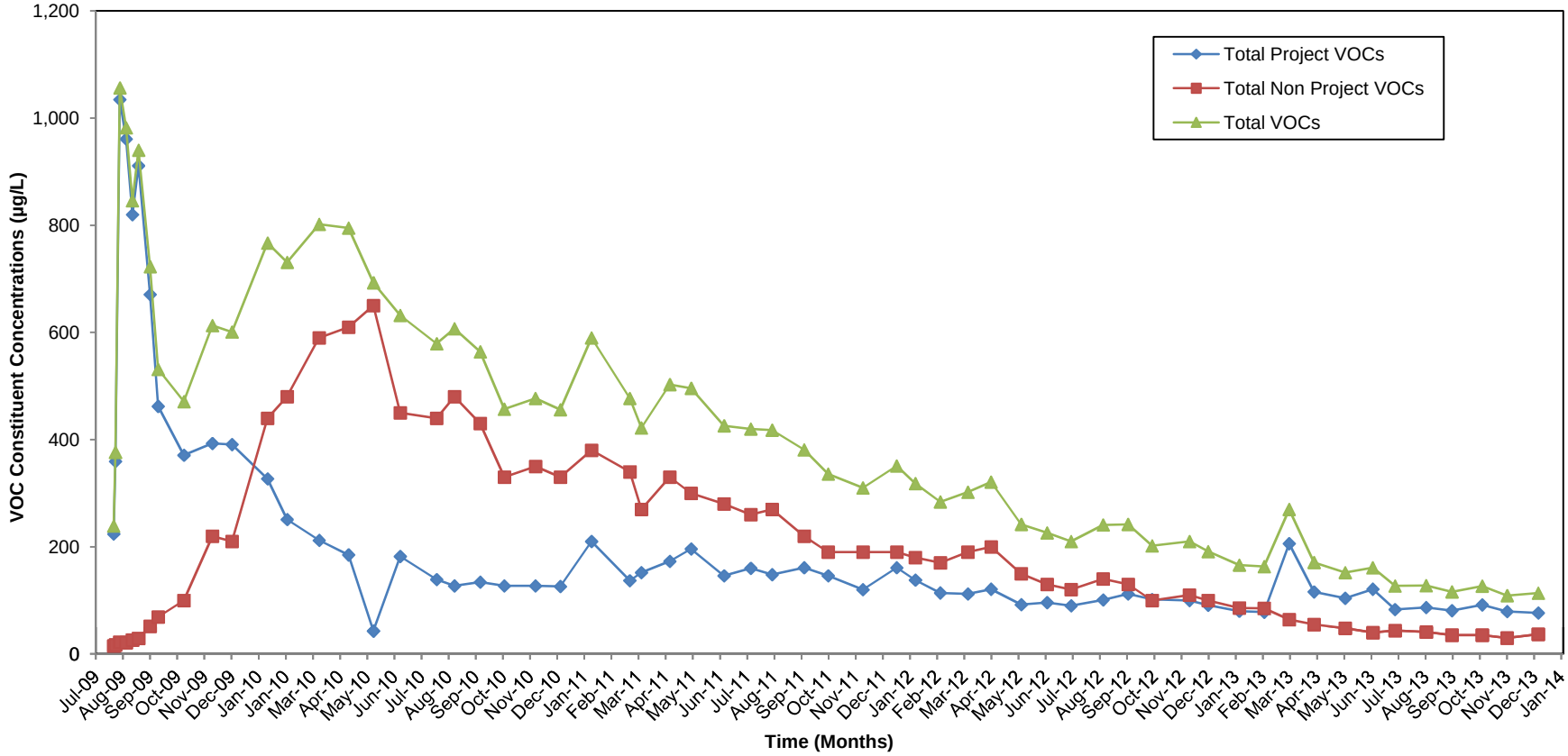
Non-Project VOCs = Sum of Total VOCs that are not Project VOCs.

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

REMEDIAL WELL NON-PROJECT VOC CONCENTRATIONS THROUGH DECEMBER 2013

ARCADIS

FIGURE 6C



Notes:
VOC = Volatile organic compound.

ug/L = Microgram per liter.

Total VOCs = 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.

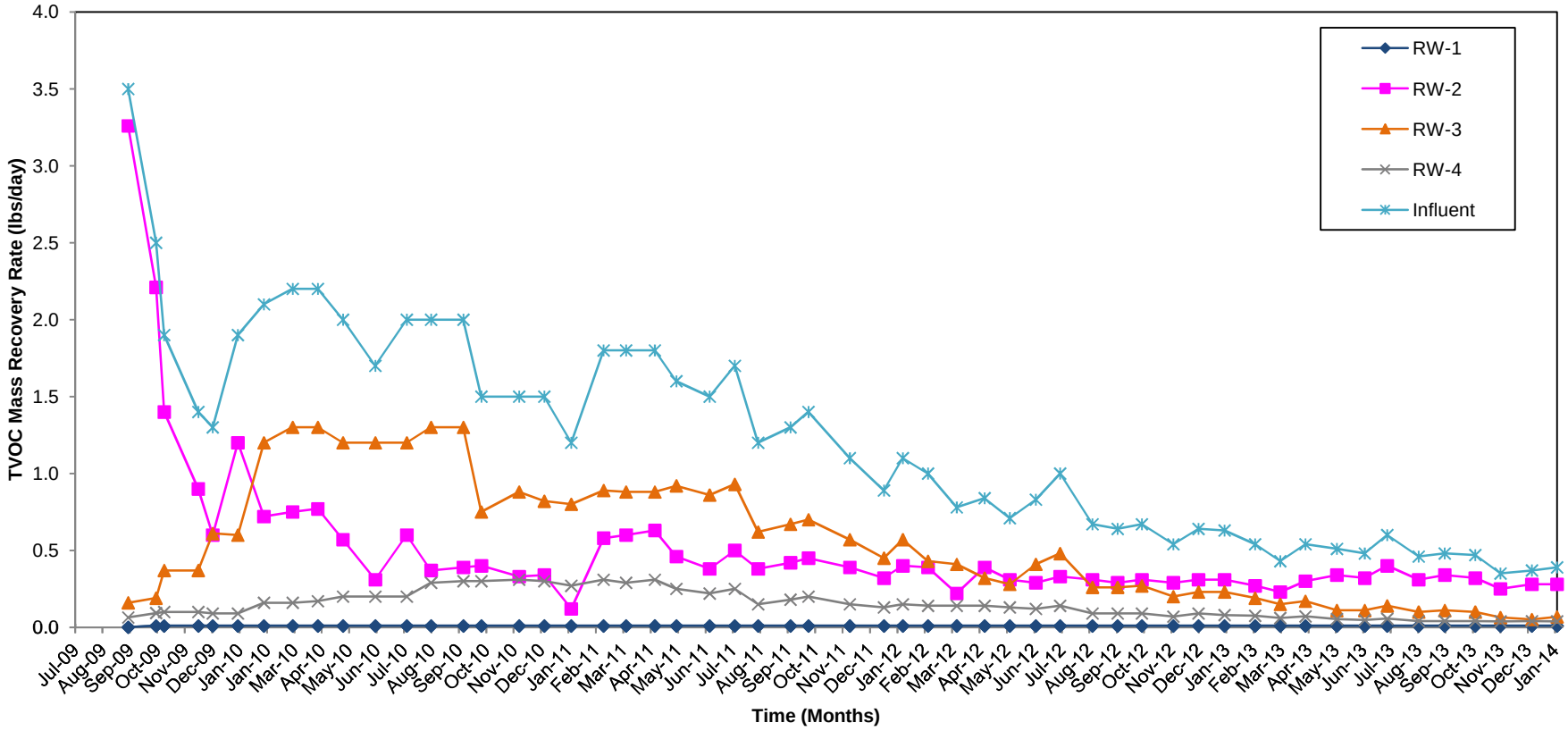
Non-Project VOCs = Sum of Total VOCs that are not Project VOCs.

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 2013

ARCADIS

FIGURE
7



Notes:

VOC = Volatile organic compound.

lbs/day = Pounds per day.

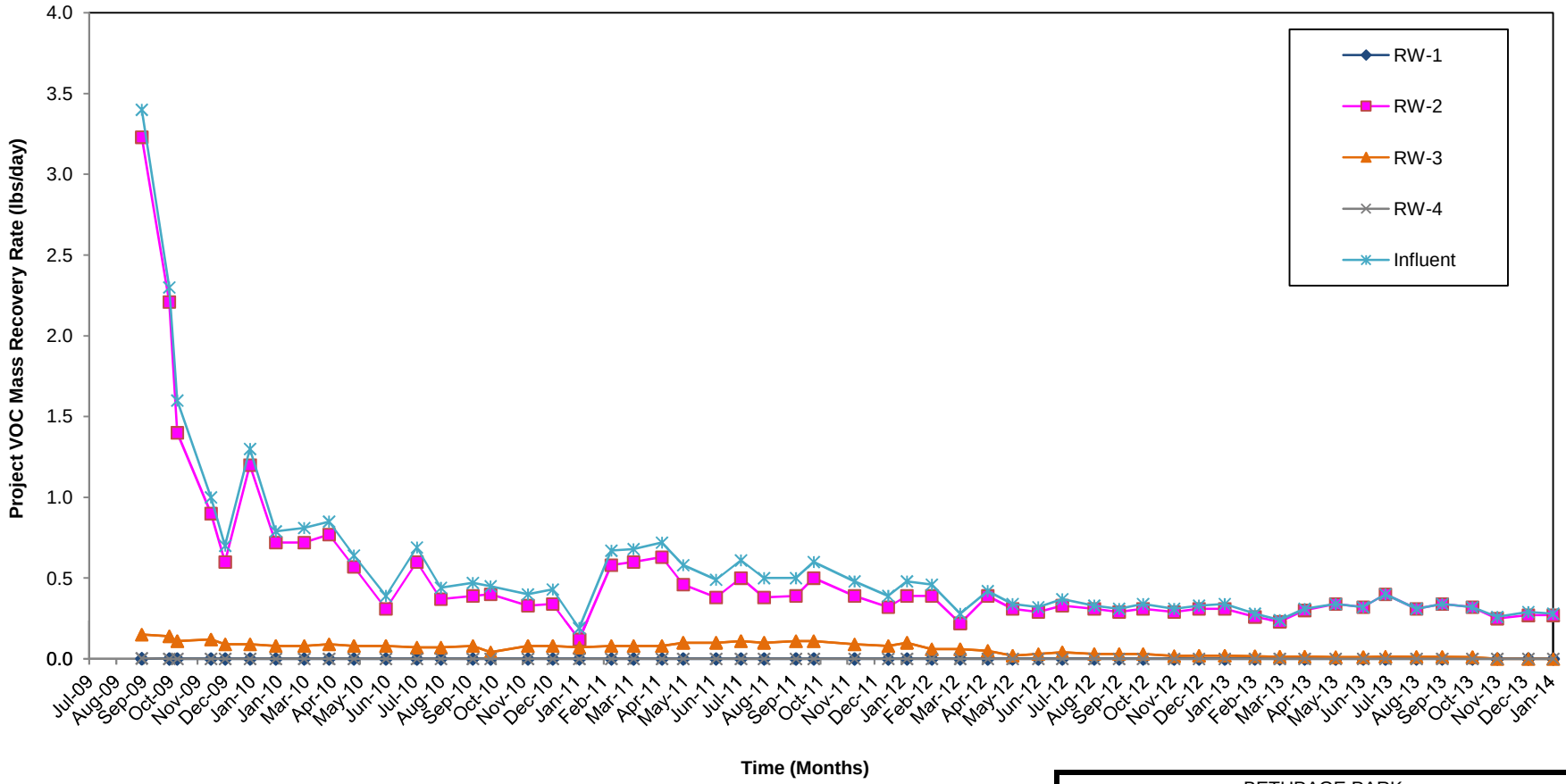
Total VOCs = Sum of VOCs detected.

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

TOTAL VOC MASS RECOVERY RATES THROUGH DECEMBER 2013

ARCADIS

FIGURE
8A



Notes:

VOC = Volatile organic compound.

lbs/day = Pounds per day.

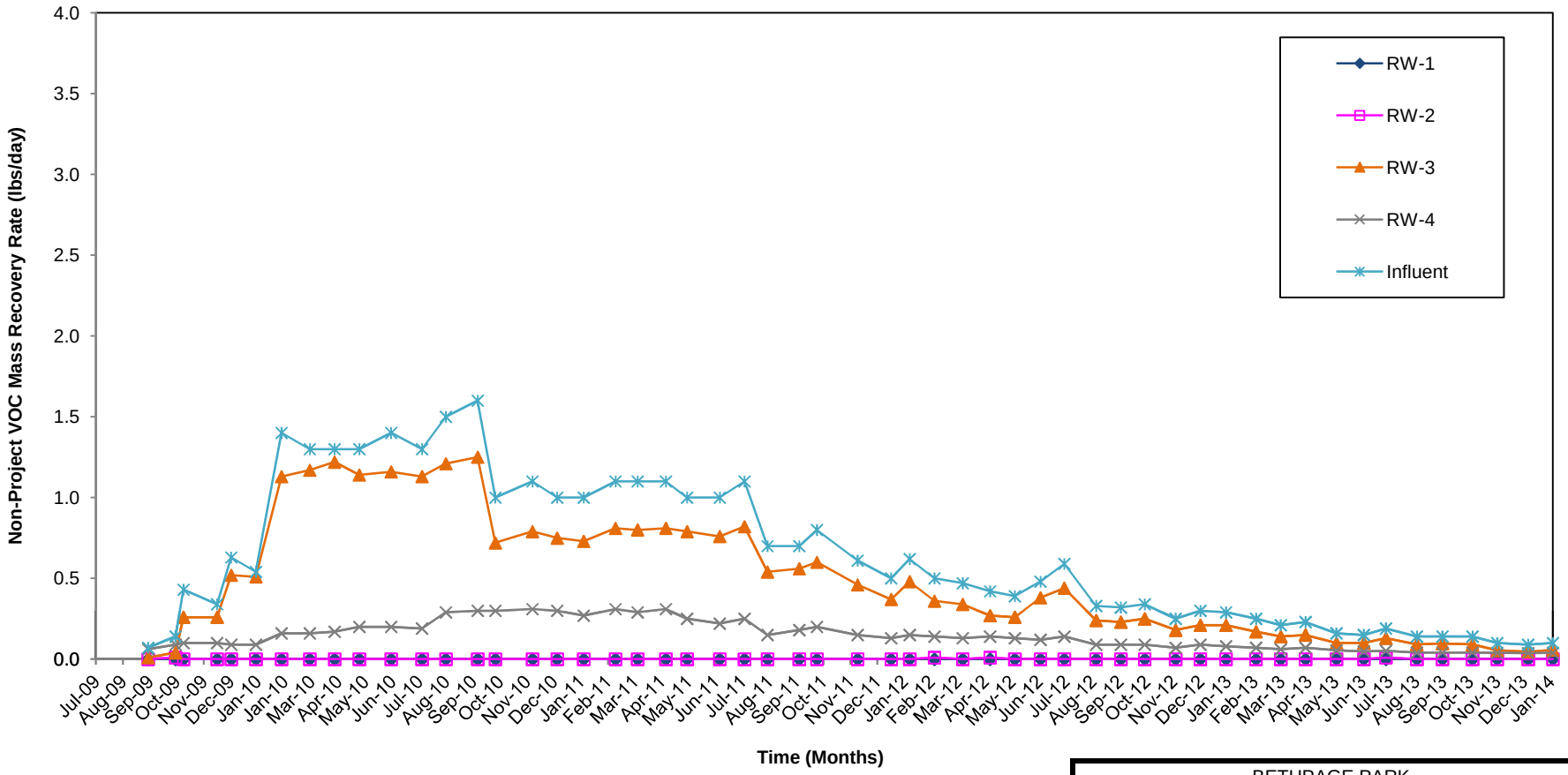
Project VOCs = Sum of 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,2- Dichloroethane; 1,1-Dichloroethene; Tetrachloroethene; Trichloroethene; Vinyl Chloride; cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; Benzene; Toluene: and Total Xylenes.

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

PROJECT VOC MASS RECOVERY RATES THROUGH DECEMBER 2013

ARCADIS

FIGURE 8B



Notes:

VOC = Volatile organic compound.

lbs/day = Pounds per day.

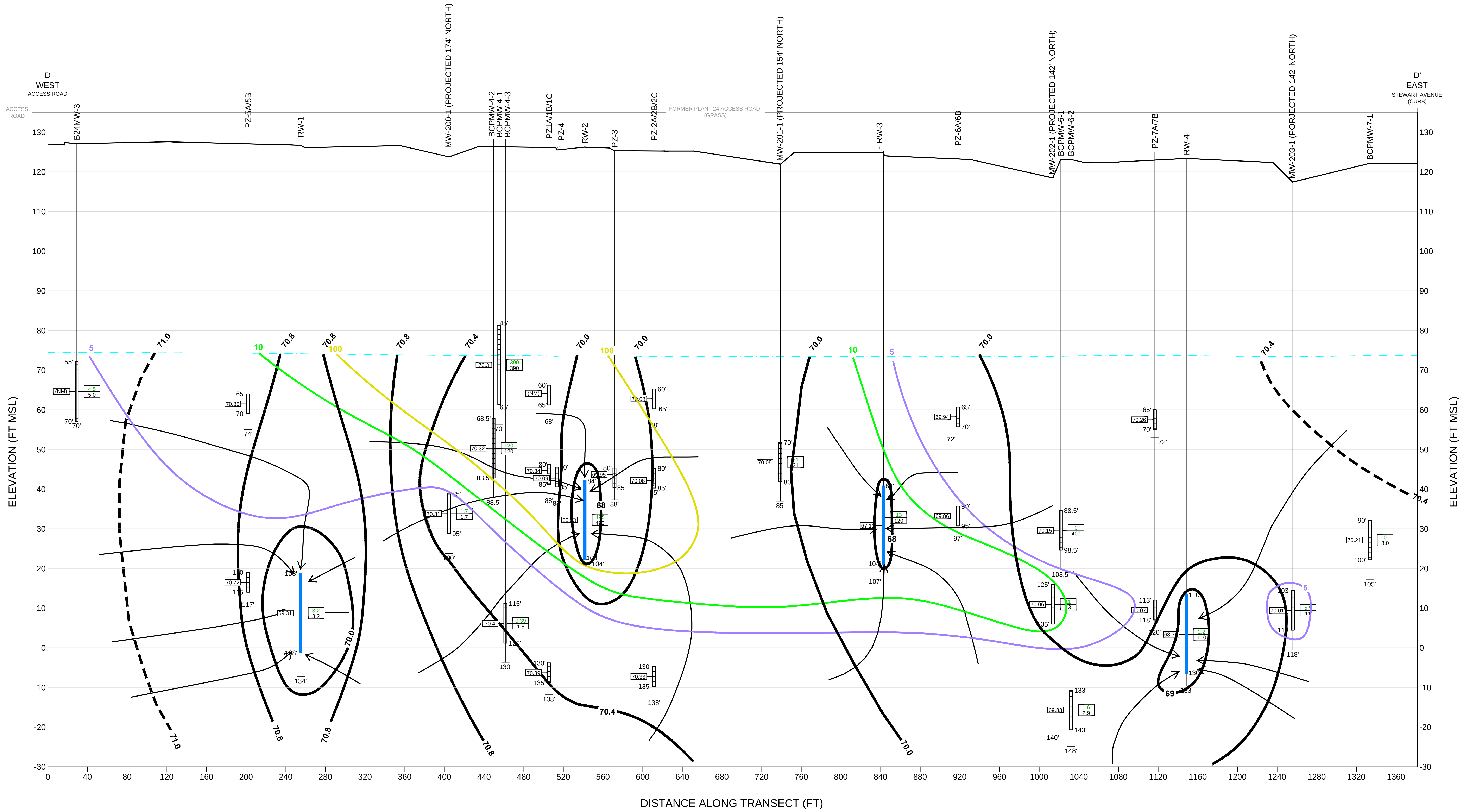
Non-Project VOCs = Sum of Total VOCs that are not Project VOCs.

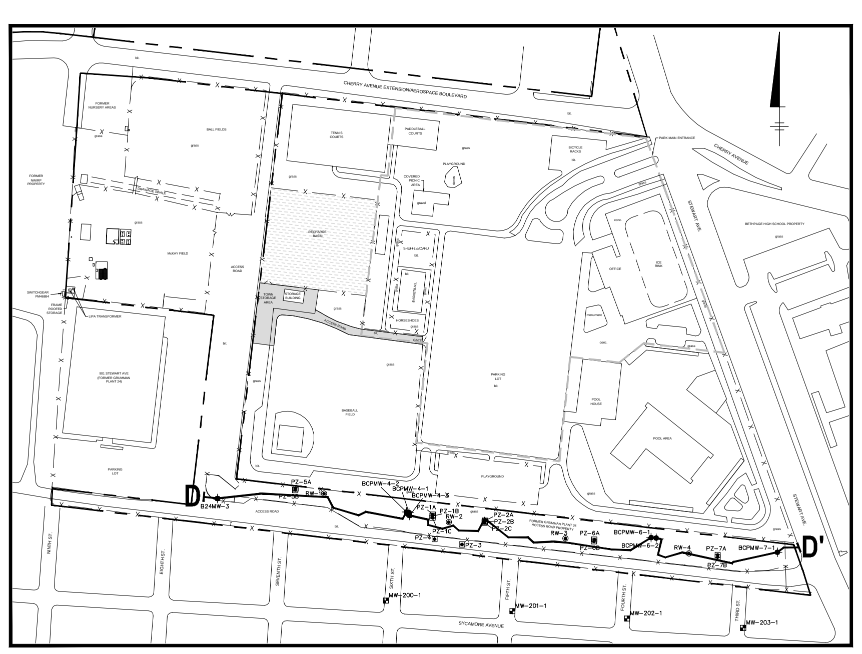
BETHPAGE PARK
GROUNDWATER CONTAINMENT SYSTEM
OPERABLE UNIT 3
(FORMER GRUMMAN SETTLING PONDS)
BETHPAGE, NEW YORK

NON-PROJECT VOC MASS RECOVERY RATES THROUGH DECEMBER 2013

ARCADIS

FIGURE 8C

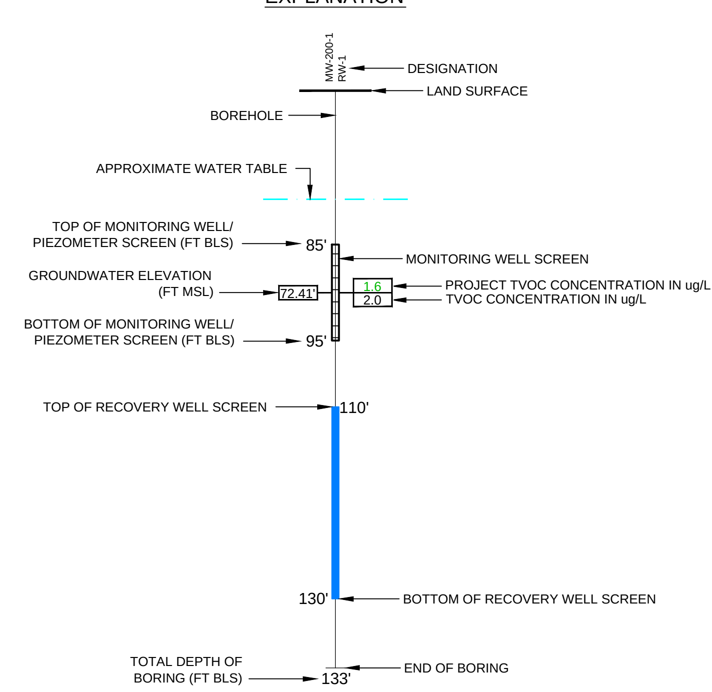




KEY PLAN
SHOWING CROSS SECTION D-D'

0 200' 400'
SCALE IN FEET

EXPLANATION



VERTICAL SCALE IN FEET
EXAGGERATION: 4x

10
0
0 40
HORIZONTAL SCALE IN FEET

DEFINITIONS:
FT - FEET
MSL - MEAN SEA LEVEL
BLS - BELOW LAND SURFACE
ug/L - MICROGRAMS PER LITER
TVOC - TOTAL VOLATILE ORGANIC COMPOUND
NM - NO MEASURED

LEGEND:

70.8 — GROUNDWATER ELEVATION CONTOUR IN FEET RELATIVE TO MEAN SEA LEVEL, DASHED WHERE LESS CONTROL AVAILABLE

← VERTICAL DIRECTION OF GROUNDWATER FLOW

10 — PROJECT TVOC CONTOUR IN ug/L, DASHED WHERE LESS CONTROL AVAILABLE

NOTES:

1. WATER LEVEL ELEVATIONS CALCULATED FROM DATA COLLECTED ON NOVEMBER 1, 2013.
2. MONITORING WELL TVOC/PROJECT TVOC DATA FROM THE MAY-JUNE 2013 COMPREHENSIVE SAMPLING ROUND. RESULT REPRESENTATED OF ENTIRE WELL SCREEN INTERVAL.
3. TVOC CONTOURS ARE BASED ON PROJECT TVOC DATA, SEE NOTE 2.
4. THE BETHPAGE PARK GROUNDWATER CONTAINMENT SYSTEM HAS BEEN DESIGNED TO ADDRESS GROUNDWATER THAT HAS TVOC CONCENTRATIONS GREATER THAN 5 μg/L IN THE UPPER 20 FEET OF THE SURFICIAL AQUIFER AND GROUNDWATER BELOW THE UPPER 20 FEET OF THE SURFICIAL AQUIFER THAT HAS TVOC CONCENTRATIONS GREATER THAN 50 μg/L.
5. PROJECT VOCS ARE VOCS THAT MAY BE RELATED TO FORMER GRUMMAN HISTORICAL ACTIVITIES. NON-PROJECT VOCS ARE VOCS THAT ARE NOT RELATED TO FORMER GRUMMAN ACTIVITIES BUT HAVE BEEN DETECTED IN THE SITE AREA. PLEASE REFER TO THE REPORT TABLES FOR LISTS OF PROJECT AND NON-PROJECT VOCS.
6. REFER TO TABLE 6 FOR PUMPING RATES OF REMEDIAL WELLS.

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

CROSS SECTION D-D' SHOWING TVOCs IN GROUNDWATER AND DIRECTION OF VERTICAL GROUNDWATER FLOW FOURTH QUARTER 2013

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FIGURE
9

CITY: (Reqd) DIV/GROUP: (Reqd) DB: (Reqd) LD: (Opt) PIC: (Opt) PM: (Reqd) TM: (Opt) LYR: (Opt)ON=*;OFF=*REF* G:\ENVCAD\SYRACUSE\ACT\NY001496\0012\005\DWG\OU3\NY1496_B05.dwg LAYOUT: 9 SAVED: 3/27/2014 4:29 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 3/27/2014 4:32 PM BY: SANCHEZ, ADRIAN
XREFS: Xref_OnSite IMAGES: PROJECTNAME: ----

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Appendix A

Well Construction Information and Environmental Effectiveness Monitoring Program

Table 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	MONITORING ACTIVITY: Water Levels [3]	WATER QUALITY [4]: VOC	WATER QUALITY [4]: Cd/Cr	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	--

See notes on last page.

Table 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	Cd/Cr	Fe/Mn
Piezometers										
PZ-01a	2	60	65	5	68	Sch. 40 PVC	Quarterly	--	--	--
PZ-01b	1	80	85	5	88	Sch. 40 PVC	Quarterly	--	--	--
PZ-01c	1	130	135	5	138	Sch. 40 PVC	Quarterly	--	--	--
PZ-02a	2	60	65	5	68	Sch. 40 PVC	Quarterly	--	--	--
PZ-02b	1	80	85	5	85	Sch. 40 PVC	Quarterly	--	--	--
PZ-02c	1	130	135	5	138	Sch. 40 PVC	Quarterly	--	--	--
PZ-03	1	80	85	5	88	Sch. 40 PVC	Quarterly	--	--	--
PZ-04	1	80	85	5	88	Sch. 40 PVC	Quarterly	--	--	--
PZ-05a	2	65	70	5	74	Sch. 40 PVC	Quarterly	--	--	--
PZ-05b	1	110	115	5	117	Sch. 40 PVC	Quarterly	--	--	--
PZ-06a	2	65	70	5	72	Sch. 40 PVC	Quarterly	--	--	--
PZ-06b	1	90	95	5	97	Sch. 40 PVC	Quarterly	--	--	--
PZ-07a	2	65	70	5	72	Sch. 40 PVC	Quarterly	--	--	--
PZ-07b	1	113	118	5	120	Sch. 40 PVC	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 OU-3 Groundwater Interim Remedial Measure Monitoring Program are shown in Figure 1.
(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: VOCs, per Table D-3 in the Quality Assurance Project Plan (QAPP), using NYSDEC ASP 2000 Method OLM 4.3.
Cd/Cr: Cadmium and Chromium using USEPA Method 6010.
Fe/Mn: Iron and Manganese using USEPA Method 6010, 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.
Sch. 40 PVC	schedule 40 polyvinyl chloride.
SS	Stainless steel.
Steel	Low carbon steel.
ft	Feet.
ft ms	Feet relative to mean sea level.
ft bls	Feet below land surface.
--	Not applicable.
VOC	Volatile organic compound.

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Appendix B

Compliance and Performance Program and Water Sample Analytical Results

Table B-1. Compliance and Performance Program Elements, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

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 (NYSDEC 2005 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]	---	Annually	Annually	NA
Remedial Well 2 (WSP-2)	VOCs (NYSDEC 2005 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]	---	Annually	Annually	NA
Remedial Well 3 (WSP-3)	VOCs (NYSDEC 2005 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]	---	Annually	Annually	NA
Remedial Well 4 (WSP-4)	VOCs (NYSDEC 2005 OLM 4.3)	Bi-Weekly	Quarterly	Quarterly	NA
	Iron (USEPA 6010C)	Bi-Weekly	Annually	Annually	NA
	Cadmium and Chromium (USEPA 6010C)[11]	---	Annually	Annually	NA
Air Stripper Influent (WSP-5)	VOCs (NYSDEC 2005 OLM 4.3)	1-hr [6]; Days 1, 3, & Weekly	Monthly	Quarterly	NA
	Iron (USEPA 6010C)	1-hr [6]; Days 1, 3, & Weekly	Monthly	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 (NYSDEC 2005 OLM 4.3)**	**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
	pH (field) [8]	**1-hr [6]; Days 1, 3, & Weekly**	**Monthly**	**Monthly**	NA
	Cadmium and Chromium (USEPA 6010C)[11]	---	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.

Table B-1. Compliance and Performance Program Elements, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

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

See notes on last page.

Table B-1. Compliance and Performance Program Elements, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

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
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.

Table B-1. Compliance and Performance Program Elements, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Northrop Grumman Systems Corporation, Bethpage, New York.

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.

Table B-2. Water Sample Analytical Results - October 7, 2013, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1,2,3]

COMPOUND (ug/L)	Sample ID: / Sample Location: / Sample Date:	WSP-05 Influent 10/7/2013	WSP-05 Dup. Influent 10/7/2013	WSP-07 Effluent 10/7/2013
Volatile Organic Compounds				
1,1,1-Trichloroethane		< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane		< 5.0	< 5.0	< 5.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane		< 5.0	< 5.0	< 5.0
1,1-Dichloroethane		**0.41 J**	**0.42 J**	< 5.0
1,1-Dichloroethene		< 5.0	**0.22 J**	< 5.0
1,2-Dichloroethane		< 5.0	< 5.0	< 5.0
1,2-Dichloropropane		< 5.0	< 5.0	< 5.0
2-Butanone		< 50	< 50	< 50
4-Methyl-2-Pentanone		< 50	< 50	< 50
Acetone		< 50	< 50	< 50
Benzene		< 0.70	< 0.70	< 0.70
Bromodichloromethane		< 5.0	< 5.0	< 5.0
Bromomethane		**0.74 J**	< 5.0	**0.70 J**
Carbon Disulfide		< 5.0	< 5.0	< 5.0
Carbon Tetrachloride		< 5.0	< 5.0	< 5.0
CFC-11		< 5.0	< 5.0	< 5.0
CFC-12		< 5.0	< 5.0	< 5.0
Chlorobenzene		< 5.0	< 5.0	< 5.0
Chlorodibromomethane		< 5.0	< 5.0	< 5.0
Chlorodifluoromethane		**35**	**37**	< 5.0
Chloroethane		< 5.0	< 5.0	< 5.0
Chloroform		**1.4 J**	**1.5 J**	< 5.0
Chloromethane		< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene		**30**	**31**	< 5.0
cis-1,3-Dichloropropene		< 5.0	< 5.0	< 5.0
Dichloromethane		< 5.0	< 5.0	< 5.0
Ethylbenzene		**0.85 J**	**0.81 J**	< 5.0
m,p-Xylene		**2.0 J**	**2.0 J**	< 5.0
Methyl N-Butyl Ketone		< 50	< 50	< 50
Methyl-Tert-Butylether		< 5.0	< 5.0	< 5.0
o-Xylene		**0.85 J**	**0.96 J**	< 5.0
Styrene (Monomer)		< 5.0	< 5.0	< 5.0
Tetrachloroethene		**0.34 J**	**0.26 J**	< 5.0
Toluene		**24**	**25**	< 5.0
trans-1,2-Dichloroethene		< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene		< 5.0	< 5.0	< 5.0
Tribromomethane		< 5.0	< 5.0	< 5.0
Trichloroethene		**5.3**	**4.7 J**	< 5.0
Vinyl Chloride		**29**	**30**	< 2.0
Subtotal VOCs [4]		**130**	**134**	**1.0**
Tentatively Identified Compounds		ND	ND	ND
Subtotal TICs [5]		0	0	0
Total VOCs [6]		**130**	**134**	**1.0**

See notes on last page.

Table B-2. Water Sample Analytical Results - October 7, 2013, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2,3)

COMPOUND (ug/L)	Sample ID: / Sample Location: / Sample Date:	WSP-05 Influent 10/7/2013	WSP-05 Dup. Influent 10/7/2013	WSP-07 Effluent 10/7/2013
Metals				
Cadmium (Dissolved)		--	--	--
Cadmium (Total)		--	--	--
Chromium (Dissolved)		--	--	--
Chromium (Total)		--	--	--
Iron (Dissolved)		**140**	--	**200**
Iron (Total)		**710**	**--**	**540**
Manganese (Dissolved)		--	--	--
Manganese (Total)		--	--	--
Mercury (Dissolved)		--	--	--
Mercury (Total)		--	--	< 0.20

Notes:

(1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses using New York State Department of Environmental Conservation ASP 2005 Method OLM 4.3 and metals using USEPA Method 6010C, except for mercury, which was analyzed using 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) "Subtotal VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.

(5) "Subtotal TICs" represents the sum of individual TICs detected. Values shown have been rounded to the nearest whole number.

(6) "Total VOCs" represent the sum of VOCs and TICs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

D	Compound reported from the diluted analysese as the concentration in the initial analysis was outside the calibration range.
dup.	Duplicate.
J	Estimated value.
ND	TIC not detected.
OM&M	Operation, maintenance and monitoring.
TIC	Tentatively identified compound.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

Table B-3. Water Sample Analytical Results - November 14, 2013, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1,2,3]

COMPOUND (ug/L)	Sample ID: / Sample Location: / Sample Date:	WSP-01 RW-1 11/14/2013	WSP-02 RW-2 11/14/2013	WSP-03 RW-3 11/14/2013	WSP-04 RW-4 11/14/2013	WSP-05 Influent 11/14/2013	WSP-07 Effluent 11/14/2013
Volatile Organic Compounds							
1,1,1-Trichloroethane		< 5.0 U	< 5.0 U	< 5.0 U	**0.23 J**	< 5.0 U	< 5.0 U
1,1,2,2-Tetrachloroethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1,2-trichloro-1,2,2-trifluoroethane		< 5.0 U	< 5.0 U	< 5.0 U	**0.29 J**	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,1-Dichloroethane		< 5.0 U	**1.0 J**	**0.23 J**	**0.38 J**	**0.45 J**	< 5.0 U
1,1-Dichloroethene		< 5.0 U	**0.54 J**	< 5.0 U	**0.25 J**	< 5.0 U	< 5.0 U
1,2-Dichloroethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
1,2-Dichloropropane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
2-Butanone		< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
4-Methyl-2-Pentanone		< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Acetone		< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Benzene		< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U	< 0.70 U
Bromodichloromethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Bromomethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Disulfide		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Carbon Tetrachloride		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
CFC-11		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
CFC-12		< 5.0 U	< 5.0 U	**0.33 J**	< 5.0 U	< 5.0 U	< 5.0 U
Chlorobenzene		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodibromomethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chlorodifluoromethane		< 5.0 U	< 5.0 U	**61**	**100**	**30**	< 5.0 U
Chloroethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chloroform		< 5.0 U	**2.0 J**	**2.5 J**	**0.37 J**	**1.2 J**	< 5.0 U
Chloromethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
cis-1,2-Dichloroethene		**0.25 J**	**100**	**6.1**	**0.22 J**	**26**	< 5.0 U
cis-1,3-Dichloropropene		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Dichloromethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Ethylbenzene		< 5.0 U	**2.9 J**	< 5.0 U	< 5.0 U	**0.78 J**	< 5.0 U
m,p-Xylene		< 5.0 U	**6.8**	< 5.0 U	< 5.0 U	**1.7 J**	< 5.0 U
Methyl N-Butyl Ketone		< 50 U	< 50 U	< 50 U	< 50 U	< 50 U	< 50 U
Methyl-Tert-Butylether		< 5.0 U	< 5.0 U	< 5.0 U	**0.24 J**	< 5.0 U	< 5.0 U
o-Xylene		< 5.0 U	**3.1 J**	< 5.0 U	< 5.0 U	**0.82 J**	< 5.0 U
Styrene (Monomer)		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Tetrachloroethene		< 5.0 U	**0.25 J**	**0.28 J**	**1.1 J**	**0.35 J**	< 5.0 U
Toluene		< 5.0 U	**84**	**0.31 J**	< 5.0 U	**22**	< 5.0 U
trans-1,2-Dichloroethene		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
trans-1,3-Dichloropropene		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Tribromomethane		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Trichloroethene		**0.77 J**	**13**	**3.9 J**	**0.76 J**	**4.8 J**	< 5.0 U
Vinyl Chloride		< 2.0 U	**88**	< 2.0 U	< 2.0 U	**23**	< 2.0 U
Subtotal VOCs [4]		**1.0**	**302**	**75**	**104**	**111**	ND
Tentatively Identified Compounds		ND	ND	ND	ND	ND	ND
Subtotal TICs [5]		0	0	0	0	0	0
Total VOCs [6]		**1.0**	**302**	**75**	**104**	**111**	0

See notes on last page.

Table B-3. Water Sample Analytical Results - November 14, 2013, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2,3)

COMPOUND (ug/L)	Sample ID: / Sample Location: / Sample Date:	WSP-01 RW-1 11/14/2013	WSP-02 RW-2 11/14/2013	WSP-03 RW-3 11/14/2013	WSP-04 RW-4 11/14/2013	WSP-05 Influent 11/14/2013	WSP-07 Effluent 11/14/2013
Metals							
Cadmium (Dissolved)		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Cadmium (Total)		< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U
Chromium (Dissolved)		**32**	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Chromium (Total)		**28**	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U
Iron (Dissolved)		< 100 U	**850**	**150**	< 100 U	**230**	**290**
Iron (Total)		< 100 U	**1540**	**280**	< 100 U	**570**	**360**
Manganese (Dissolved)		--	--	--	--	--	--
Manganese (Total)		--	--	--	--	--	--
Mercury (Dissolved)		--	--	--	--	--	--
Mercury (Total)		< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U	< 0.20 U

Notes:

(1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses using New York State Department of Environmental Conservation ASP 2005 Method OLM 4.3 and metals using USEPA Method 6010C, except for mercury, which was analyzed using 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) "Subtotal VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.

(5) "Subtotal TICs" represents the sum of individual TICs detected. Values shown have been rounded to the nearest whole number.

(6) "Total VOCs" represent the sum of VOCs and TICs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

D	Compound reported from the diluted analysese as the concentration in the initial analysis was outside the calibration range.
dup.	Duplicate.
J	Estimated value.
ND	TIC not detected.
OM&M	Operation, maintenance and monitoring.
TIC	Tentatively identified compound.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

Table B-4. Water Sample Analytical Results - December 9, 2013, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. [1,2,3]

COMPOUND (ug/L)	Sample ID: / Sample Location: / Sample Date:	WSP-05 Influent 12/9/2013	WSP-05 Dup. Influent 12/9/2013	WSP-07 Effluent 12/9/2013
Volatile Organic Compounds				
1,1,1-Trichloroethane		< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane		< 5.0	< 5.0	< 5.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane		< 5.0	< 5.0	< 5.0
1,1-Dichloroethane		**0.30 J**	**0.33 J**	< 5.0
1,1-Dichloroethene		**0.20 J**	< 5.0	< 5.0
1,2-Dichloroethane		< 5.0	< 5.0	< 5.0
1,2-Dichloropropane		< 5.0	< 5.0	< 5.0
2-Butanone		< 50	< 50	< 50
4-Methyl-2-Pentanone		< 50	< 50	< 50
Acetone		< 50	< 50	< 50
Benzene		< 0.70	< 0.71	< 0.70
Bromodichloromethane		< 5.0	< 5.0	< 5.0
Bromomethane		< 5.0	< 5.0	< 5.0
Carbon Disulfide		< 5.0	< 5.0	< 5.0
Carbon Tetrachloride		< 5.0	< 5.0	< 5.0
CFC-11		< 5.0	< 5.0	< 5.0
CFC-12		< 5.0	< 5.0	< 5.0
Chlorobenzene		< 5.0	< 5.0	< 5.0
Chlorodibromomethane		< 5.0	< 5.0	< 5.0
Chlorodifluoromethane		**37**	**38**	< 5.0
Chloroethane		< 5.0	< 5.0	< 5.0
Chloroform		**1.4 J**	**1.5 J**	< 5.0
Chloromethane		< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene		**26**	**25**	< 5.0
cis-1,3-Dichloropropene		< 5.0	< 5.0	< 5.0
Dichloromethane		< 5.0	< 5.0	< 5.0
Ethylbenzene		**0.71 J**	**0.82 J**	< 5.0
m,p-Xylene		**1.7 J**	**1.5 J**	< 5.0
Methyl N-Butyl Ketone		< 50	< 50	< 50
Methyl-Tert-Butylether		< 5.0	< 5.0	< 5.0
o-Xylene		**0.83 J**	**0.77 J**	< 5.0
Styrene (Monomer)		< 5.0	< 5.0	< 5.0
Tetrachloroethene		**0.34 J**	**0.30 J**	< 5.0
Toluene		**22**	**23**	< 5.0
trans-1,2-Dichloroethene		< 5.0	< 5.0	< 5.0
trans-1,3-Dichloropropene		< 5.0	< 5.0	< 5.0
Tribromomethane		< 5.0	< 5.0	< 5.0
Trichloroethene		**4.2 J**	**3.8 J**	< 5.0
Vinyl Chloride		**21**	**21**	< 2.0
Subtotal VOCs [4]		**116**	**116**	0
Tentatively Identified Compounds		ND	ND	ND
Subtotal TICs [5]		0	0	0
Total VOCs [6]		**116**	**116**	0

See notes on last page.

Table B-4. Water Sample Analytical Results - December 9, 2013, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2,3)

COMPOUND (ug/L)	Sample ID: / Sample Location: / Sample Date:	WSP-05 Influent 12/9/2013	WSP-05 Dup. Influent 12/9/2013	WSP-07 Effluent 12/9/2013
Metals				
Cadmium (Dissolved)		--	--	--
Cadmium (Total)		--	--	--
Chromium (Dissolved)		--	--	--
Chromium (Total)		--	--	--
Iron (Dissolved)		**190**	--	**220**
Iron (Total)		**240**	**--**	**270**
Manganese (Dissolved)		--	--	--
Manganese (Total)		--	--	--
Mercury (Dissolved)		--	--	--
Mercury (Total)		--	--	< 0.20

Notes:

(1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental for VOC analyses using New York State Department of Environmental Conservation ASP 2005 Method OLM 4.3 and metals using USEPA Method 6010C, except for mercury, which was analyzed using 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) "Subtotal VOCs" represents the sum of individual concentrations of VOCs detected. Values shown have been rounded to the nearest whole number.

(5) "Subtotal TICs" represents the sum of individual TICs detected. Values shown have been rounded to the nearest whole number.

(6) "Total VOCs" represent the sum of VOCs and TICs detected. Values shown have been rounded to the nearest whole number.

Acronyms\Key:

Bold value indicates a detection.

D	Compound reported from the diluted analysese as the concentration in the initial analysis was outside the calibration range.
dup.	Duplicate.
J	Estimated value.
ND	TIC not detected.
OM&M	Operation, maintenance and monitoring.
TIC	Tentatively identified compound.
USEPA	United States Environmental Protection Agency.
VOC	Volatile organic compound.
ug/L	Micrograms per liter.
--	Not analyzed.
< 5 U	Compound not detected above its laboratory quantification limit.

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Appendix C

Vapor Sample Analytical Results

Table C-1. Vapor Sample Analytical Results - November 14, 2013, 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 11/14/2013	VSP-3 [5] VPGAC Mid-Train [5] 11/14/2013	VSP-2 [5] VPGAC Effluent [5] 11/14/2013	VSP-5 [6] PPZ Mid-Train [6] 11/14/2013	VSP-4 [6] Effluent [6] 11/14/2013
Volatile Organic Compounds						
1,1,1-Trichloroethane		**1.0**	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
1,1,2,2-Tetrachloroethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
1,1,2-trichloro-1,2,2-trifluoroethane		**2.3**	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
1,1,2-Trichloroethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
1,1-Dichloroethane		**5.4**	**7.3**	**3.9**	**1.3**	**1.4**
1,1-Dichloroethene		**2.0**	**2.9**	**4.7**	**0.84**	< 0.80 U
1,2-Dichloroethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
1,2-Dichloropropane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
1,3-Butadiene		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
1-Chloro-1,1-difluoroethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
2-Butanone		< 9.2 U	**8.6**	< 15 U	< 7.6 U	< 8.0 U
4-Methyl-2-Pentanone		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Acetone		**17**	**130**	**150**	**55**	**15**
Benzene		**1.9**	**2.7**	< 1.5 U	**0.83**	**0.91**
Bromodichloromethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Bromomethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Carbon Disulfide		< 9.2 U	< 7.3 U	< 15 U	< 7.6 U	**8.9**
Carbon Tetrachloride		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
CFC-11		**1.6**	**1.4**	**2.5**	**1.7**	**1.8**
CFC-12		**2.4**	**2.3**	**2.5**	**2.4**	**2.5**
Chlorobenzene		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Chlorodibromomethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Chlorodifluoromethane		**400 D**	**140**	**210**	**140**	**400 D**
Chloroethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Chloroform		**19**	**14**	**2.4**	**3.3**	**2.9**
Chloromethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
cis-1,2-Dichloroethene		**470 D**	**830 D**	**74**	**61**	**4.6**
cis-1,3-Dichloropropene		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Dichloromethane		< 0.92 U	**0.81**	< 1.5 U	< 0.76 U	< 0.80 U
Ethylbenzene		**12**	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
m,p-Xylene		**27**	< 1.5 U	< 2.9 U	< 1.5 U	< 1.6 U
Methyl N-Butyl Ketone		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Methyl-Tert-Butylether		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
o-Xylene		**14**	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Styrene (Monomer)		**11**	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Tetrachloroethene		**3.6**	**1.1**	< 1.5 U	< 0.76 U	< 0.80 U
Toluene		**370 D**	< 0.73 U	< 1.5 U	**18**	**19**
trans-1,2-Dichloroethene		< 0.92 U	**2.6**	< 1.5 U	< 0.76 U	< 0.80 U
trans-1,3-Dichloropropene		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Tribromomethane		< 0.92 U	< 0.73 U	< 1.5 U	< 0.76 U	< 0.80 U
Trichloroethene		**66**	< 0.73 U	< 1.5 U	**2.5**	< 0.80 U
Vinyl Chloride		**320 D**	**310 D**	**260**	**100**	**2.6**
Total VOCs		**1,746**	**1,454**	**710**	**387**	**460**

See notes on last page.

Table C-1. Vapor Sample Analytical Results - November 14, 2013, 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 11/14/2013	VSP-3 [5] VPGAC Mid-Train [5] 11/14/2013	VSP-2 [5] VPGAC Effluent [5] 11/14/2013	VSP-5 [6] PPZ Mid-Train [6] 11/14/2013	VSP-4 [6] Effluent [6] 11/14/2013
Tentatively Identified Compounds						
2-Butoxyethanol		--	--	**3.2 JN**	--	--
2,5-Hexanedione		**16 JN**	**13 JN**	--	--	--
Acetaldehyde		**4.9 JN**	--	**4.5 JN**	--	--
Acetophenone		**57 JN**	**74 JN**	**10 JN**	**24 JN**	**24 JN**
alpha-Cumyl Alcohol		**130 JN**	**310 JN**	**30 JN**	--	--
alpha-Methylstyrene		**6.3 JN**	--	--	--	--
Dimethylsilanediol		--	**81 JN**	**5.9 JN**	--	--
Hexamethylcyclotrisiloxane		**10 JN**	**73 JN**	**67 JN**	**24 JN**	**17 JN**
Isopentane		**4.4 JN**	--	--	--	--
Methylcyclohexane		**6.2 JN**	--			
Methyl styrene (alpha)		--	--	--	--	--
N-Butane		**4.1 JN**	--	--	--	--
N-Dodecane		--	--	--	--	**19 JN**
N-Undecane		--	--	--	**50 JN**	**20 JN**
Pentylcyclohexane		--	--	--	**54 JN**	**21 JN**
Phenol		**4.0 JN**	--	--	--	--
Propylene Glycol		**9.2 JN**	--	--	--	--
Trimethylsilanol		**4.4 JN**	**150 JN**	**82 JN**	**300 JN**	--
Unidentified Compound		--	**29 JN**	**39 JN**	**25 JN**	**230 JN**
Unidentified Compound		--	**--**	**--**	**--**	**13 JN**
Unidentified Compound		--	**6.3 JN**	--	**33 JN**	**13 JN**
Unidentified Compound		--	--	--	**27 JN**	**14 JN**
Unidentified Compound		--	--	--	**68 JN**	**12 JN**
Unidentified Siloxane		--	**7.1 JN**	**3.7 JN**	--	**77 JN**
Unknown C7H12O3 Compound		**9.2 JN**	--	--	--	--
Unknown C7H12O3 Compound		**4.7 JN**	--	--	--	--
Unknown C8H9NO2 Compound		--	**26 JN**	--	--	--
Unknown C10H20 Compound		--	--	--	**24 JN**	--
Unknown C11H20 Compound		--	--	--	**39 JN**	**24 JN**
Unknown C11H20 Compound		--	--	--	**41 JN**	--
Unknown C12H26 Branched Alkane		--	--	--	**49 JN**	**19 JN**
Unknown C12H26 Branched Alkane		--	--	--	**31 JN**	**12 JN**
Unknown C12H26 Branched Alkane		--	--	--	**40 JN**	**12 JN**
Unknown C12H26 Branched Alkane		--	--	--	**100 JN**	**36 JN**
Unknown C12H26 Branched Alkane		--	--	--	**61 JN**	**18 JN**
Unknown C12H26 Branched Alkane		--	--	--	**91 JN**	**28 JN**
Unknown C12H26 Branched Alkane		--	--	--	**110 JN**	**40 JN**
Unknown C13H28 Branched Alkane		--	--	--	**57 JN**	**13 JN**

See notes on last page.

Table C-1. Vapor Sample Analytical Results - November 14, 2013, Bethpage Park Groundwater Containment System, Operable Unit 3 (Former Grumman Settling Ponds), Bethpage, New York. (1,2,3)

Notes:

(1) Samples collected by ARCADIS on the dates shown and submitted to ALS Environmental 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 (Appendix A) of the Groundwater OM&M (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) The VPGAC Mid-Train and VPGAC Effluent samples were inadvertently mislabeled in the field by the sampling technician as VSP-3 and VSP-2, respectively.
(6) The PPZ Mid-Train and Effluent samples were inadvertently mislabeled in the field by the sampling technician as VSP-5 and VSP-4, respectively.

Acronyms\Key:

Bold value indicates a detection.

D	Concentration is based on a diluted sample analysis.
JN	Compound tentatively identified, concentration is estimated.
OM&M	Operation, maintenance and monitoring.
NYSDEC	New York State Department of Environmental Conservation.
TIC	Tentatively identified compound.
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.

ARCADIS

Appendix D

Air Discharge Quality Evaluation

ARCADIS

Table D-1. Annual 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:	02/04/13	04/01/13	07/01/13	11/14/13
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)]		1,885	1,899	2,003	1,970
Air Flow Rate (acfm @ stack temp)[(2)]		1,866	1,891	2,017	1,969
Stack Gas Exit Temperature (K)[(1)]		291	293	296	294
Ambient Air Temperature (K)[(3)]		271	281	295	281
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)]		2,215	2,169	1,988	2,067
Annualization Factor[(6)]		0.08	0.08	0.08	0.08
Average Annual Concentration at Receptor Height ($\mu g/m^3$)[(7)]		177	174	159	165
Distance To Max Concentration (m)[(8)]		8	8	8	8

See notes on last page.

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

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) Beginning with the January 2013 site visit the air flow rate in scfm is obtained from SCADA HMI.

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.

Table D-2. Annual 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)			
	02/04/13	04/01/13	07/01/13	11/14/13
1,1,1 - Trichloroethane	0	0	0	0
1,1 - Dichloroethane	1.8	4.1	1.6	1.4
1,1 - Dichloroethene	3.3	5.3	0	0
Acetone	49	44	97	15
Carbon Disulfide	0	0	0	8.9
Chloroform	3.6	4.9	2.8	2.9
Ethylbenzene	0	1	0	0
Xylenes (o)	0.98	1.5	0	0
Xylenes (m,p)	1.6	2.9	0	0
Chloromethane	0	0	0	0
Tetrachloroethene	0	0	0	0
Trichloroethene	4.6	3.8	2	0
Vinyl Chloride	57	42	50	2.6
cis 1,2-Dichloroethene	46	43	25	4.6
trans 1,2 Dichloroethene	0	0	0	0
Benzene	1.1	2.3	1.7	0.91
Toluene	20	49	20	19
Trichlorofluoromethane (Freon 11)	2.3	1.9	0	1.8
Dichlorodifluoromethane (Freon 12)	2.6	2.8	2.7	2.5
Chlorodifluoromethane (Freon 22)	820	560	520	400

See notes on last page.

Table D-2. Annual 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]	Maximum Allowable Stack Concentration[3] (µg/m^3)			
	(µg/m^3)	02/04/13	04/01/13	07/01/13	11/14/13
1,1,1 - Trichloroethane	5,000	3.20E+07	3.23E+07	3.30E+07	3.25E+07
1,1 - Dichloroethane	0.63	4.04E+03	4.07E+03	4.16E+03	4.10E+03
1,1 - Dichloroethene	70	4.49E+05	4.52E+05	4.62E+05	4.55E+05
Acetone	30,000	1.92E+08	1.94E+08	1.98E+08	1.95E+08
Carbon Disulfide	700	4.49E+06	4.52E+06	4.62E+06	4.55E+06
Chloroform	0.043	2.76E+02	2.78E+02	2.84E+02	2.80E+02
Ethylbenzene	1,000	6.41E+06	6.46E+06	6.61E+06	6.51E+06
Xylenes (o)	100	6.41E+05	6.46E+05	6.61E+05	6.51E+05
Xylenes (m,p)	100	6.41E+05	6.46E+05	6.61E+05	6.51E+05
Chloromethane	90	5.77E+05	5.81E+05	5.95E+05	5.86E+05
Tetrachloroethene	1	6.41E+03	6.46E+03	6.61E+03	6.51E+03
Trichloroethene	0.5	3.20E+03	3.23E+03	3.30E+03	3.25E+03
Vinyl Chloride	0.11	7.05E+02	7.10E+02	7.27E+02	7.16E+02
cis 1,2 Dichloroethene	63	4.04E+05	4.07E+05	4.16E+05	4.10E+05
trans 1,2 Dichloroethene	63	4.04E+05	4.07E+05	4.16E+05	4.10E+05
Benzene	0.13	8.33E+02	8.40E+02	8.59E+02	8.46E+02
Toluene	5,000	3.20E+07	3.23E+07	3.30E+07	3.25E+07
Trichlorofluoromethane (Freon 11)	5,000	3.20E+07	3.23E+07	3.30E+07	3.25E+07
Dichlorodifluoromethane (Freon 12)	12,000	7.69E+07	7.75E+07	7.93E+07	7.81E+07
Chlorodifluoromethane (Freon 22)	50,000	3.20E+08	3.23E+08	3.30E+08	3.25E+08

See notes on last page.

Table D-2. Annual 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 Maximum Allowable Stack Concentration[4]			
	02/04/13	04/01/13	07/01/13	11/14/13
1,1,1 - Trichloroethane	0.00%	0.00%	0.00%	0.00%
1,1 - Dichloroethane	0.04%	0.10%	0.04%	0.03%
1,1 - Dichloroethene	0.00%	0.00%	0.00%	0.00%
Acetone	0.00%	0.00%	0.00%	0.00%
Carbon Disulfide	0.00%	0.00%	0.00%	0.00%
Chloroform	1.31%	1.76%	0.99%	1.04%
Ethylbenzene	0.00%	0.00%	0.00%	0.00%
Xylenes (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%
Tetrachloroethene	0.00%	0.00%	0.00%	0.00%
Trichloroethene	0.14%	0.12%	0.06%	0.00%
Vinyl Chloride	8.09%	5.91%	6.88%	0.36%
cis 1,2 Dichloroethene	0.01%	0.01%	0.01%	0.00%
trans 1,2 Dichloroethene	0.00%	0.00%	0.00%	0.00%
Benzene	0.13%	0.27%	0.20%	0.11%
Toluene	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%

Notes:

(1) Actual effluent concentrations are analytical results from air samples collected on the dates shown. Data in this table corresponds to approximately the past year of system operation.

(2) AGC refers to the compound-specific annual guideline concentration per the NYSDEC DAR-1 AGC/SGC tables, revised October 18, 2010.

(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.

Acronyms\Key:

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

AGC Annual guideline concentration.

MASC Maximum allowable stack concentration.