ARCADIS

Second Quarter 2001
Groundwater Monitoring Report

Operable Unit 2
Northrop Grumman Corporation,
Bethpage, New York

P R E P A R E D F O R

Northrop Grumman Corporation

ARCADIS

David E. Stern
Project Scientist/Hydrogeologist

Carlo San Giovanni
Principal Scientist/Project Manager

Michael F. Wolfert
Project Director/Hydrogeologist

Second Quarter 2001 Groundwater Monitoring Report

Operable Unit 2
Northrop Grumman Corporation,
Bethpage, New York

Prepared for:
Northrop Grumman Corporation

Prepared by:
ARCADIS G&M, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610

Our Ref.:
NY001321.0001.00004

Date:
9 January 2002

Table of Contents

Tables

Figures

Appendices

ARCADIS

Second Quarter 2001 Groundwater Monitoring Report

Northrop Grumman Corporation, Bethpage, New York

1. Introduction

This groundwater monitoring report was prepared as part of the operation, maintenance, and monitoring (OM&M) activities for the Operable Unit 2 (OU2) groundwater remedy at the Northrop Grumman Corporation (Northrop Grumman) Bethpage, New York facility. Both the hydraulic (i.e., groundwater elevation measurements) and groundwater quality monitoring activities described in this report are currently being conducted by Northrop Grumman on a voluntary basis in accordance with the New York State Department of Environmental Conservation (NYSDEC)- approved groundwater monitoring plan (ARCADIS Geraghty & Miller, Inc., 2001a). The purpose of the monitoring is to evaluate the effectiveness of the OU2 remedy at achieving the remedial goal of preventing the off-site migration of volatile organic compound (VOC)-impacted groundwater. A groundwater Record of Decision (ROD) for the Northrop Grumman and Naval Weapons Industrial Reserve Plant (NWIRP) sites was signed and issued by the NYSDEC on March 29, 2001. In addition to other items, the ROD incorporated the former groundwater Interim Remedial Measure (IRM) into the final ROD remedy for the sites. Upon execution of a Remedial Design/Remedial Action (RD/RA) Consent Order, an OM&M plan will be prepared and submitted to the NYSDEC for review. Following NYSDEC approval of the plan, the specified groundwater monitoring and reporting will be implemented as a required component of the groundwater remedy.

As described in the First Quarter 2001 Groundwater Monitoring Report (ARCADIS G&M, Inc. 2001b), this report has a slightly different emphasis from past quarterly reports. The same information will continue to be collected and provided as in past quarterly reports (with the exception of precipitation data). However, the evaluation of the groundwater monitoring data will focus on evaluating short-term changes (i.e., between quarters) rather than providing a detailed analysis and evaluation of data for the entire period of record. The latter will continue to be performed for the annual (i.e., fourth quarter) report.

Therefore, this report discusses short-term changes in groundwater flow, if any, OU2 system operation, groundwater quality observed during the second quarter of 2001 (April to June 2001) and presents a comparison of the second quarter data to the results from the previous quarter. As in previous groundwater monitoring reports, this report also includes findings, conclusions, and recommendations for modifications to the current groundwater monitoring program. The conclusions and recommendations made in this report will continue to be re-evaluated in future reports as additional

hydraulic and groundwater quality data become available and recommendations will be incorporated, as appropriate, into the final OM&M Plan.

2. Monitoring Program

Except as described in Section 2.3 (Modifications to the Field Program) of this report, the second quarter 2001 groundwater monitoring network (hydraulic and groundwater quality) is consistent with the network listed in the OU2 Groundwater Monitoring Plan (ARCADIS Geraghty & Miller, Inc. 2001a), which was given approval by the NYSDEC. The Northrop Grumman site, the location of the OU2 systems, neighboring properties (i.e., the NWIRP and Occidental Chemical Corporation/RUCO Polymer Corporation sites), and monitoring well locations are shown on Figure 1.

The hydrogeologic zones monitored include the shallow zone, the intermediate zone, the deep zone, and the deep2 (D2) zone. These zones were defined and discussed in detail in the groundwater flow modeling report, provided as Appendix B of the Groundwater Feasibility Study (ARCADIS Geraghty & Miller, Inc. 2000).

Hydraulic and groundwater quality monitoring for the second quarter 2001 was conducted from April 30 to June 21, 2001. Appendix A contains water-level measurement logs, Appendix B contains groundwater sampling logs, Appendix C contains chain-of-custody records, and Appendix D contains data validation memoranda.

2.1 Hydraulic Monitoring

Field conditions encountered during the second quarter 2001 monitoring round prevented measuring water levels in one well in the hydraulic monitoring network and three wells were added to the hydraulic monitoring network; for additional detail, see Section 2.3 – Modifications to the Field Program, of this report.

Water levels were measured to determine the hydraulic effects, both horizontally and vertically, of pumping the OU2 remedial wells and Well GP-3. The results of the second quarter 2001 hydraulic monitoring round are described in Section 4 (Groundwater Flow) of this report.

2.2 Groundwater Quality Monitoring

Field conditions encountered during the second quarter 2001 monitoring round prevented sampling one well in the groundwater quality monitoring network and two wells were added to the groundwater quality monitoring network; for additional detail, see Section 2.3 – Modifications to Field Program, of this report. Section 5 (Groundwater Quality) of this report summarizes the analytical results of groundwater samples collected during the second quarter of 2001.

2.3 Modifications to Field Program

The number of wells where water levels were measured and groundwater samples were collected was modified this round, as follows:

- An airline has been installed in Well GP-1; therefore the pumping depth-to-water was measured this round; this well will be included in subsequent hydraulic measurement rounds.

- Water-level measurements and groundwater samples cannot currently be obtained from Monitoring Well N-10624 due to silt in the well screen.

- New monitoring wells installed by the U.S. Navy (GM-78S and GM-78I) were added to the quarterly groundwater monitoring network (i.e., hydraulic [water-level] monitoring and groundwater quality monitoring for both VOCs and select metals).

3. OU2 Operational Monitoring

Northrop Grumman collected water samples from the OU2 remedial wells (GP-1, ONCT-1, ONCT-2, and ONCT-3), Industrial Supply Well GP-3, and the influent and effluent streams from the two OU2 groundwater treatment facilities (i.e., Plants 5 [GP-1] and 5E [ONCT] systems) on a weekly basis in the second quarter of 2001. These samples were analyzed by Northrop Grumman's internal laboratory for trichloroethene (TCE) or TCE and vinyl chloride monomer (VCM). TCE or TCE/VCM concentrations for the OU2 wells/industrial supply wells and the OU2 treatment systems during the second quarter of 2001 are provided in Tables 1 and 2, respectively. Section 5 (Groundwater Quality) of this report discusses the results of the weekly operational monitoring of the OU2 system. Northrop Grumman also records the total

pumpage of the OU2 wells and Industrial Supply Well GP-3 on a weekly basis (for additional details, see Section 3.1 – Pumpage, of this report).

In addition to the samples collected by Northrop Grumman (and described above), water samples were collected by ARCADIS G&M as part of the quarterly monitoring activities from OU2 Wells GP-1, ONCT-1, ONCT-2, and ONCT-3; Well GP-3, and the influent and effluent water streams from Plants 5 and 5E. These samples were analyzed for the full Target Compound List (TCL) for VOCs. Section 5 (Groundwater Quality) of this report discusses the results of the quarterly sampling of the OU2 wells. Furthermore, ARCADIS G&M also collects hydraulic (pumping depth to water) measurements and instantaneous pumping rates from OU2 Wells GP-1, ONCT-1, ONCT-2, and ONCT-3 during each quarterly monitoring round (an instantaneous flow rate cannot currently be measured in Well GP-1; for additional details, see Section 3.1 – Pumpage, of this report).

Collectively, the above data are utilized as follows:

- To determine the volume of groundwater pumped, which is compared to the design pumpage.
- To document and monitor the specific capacities of the OU2 remedial wells.
- To calculate the VOC mass removed (in combination with the water quality data) by the OU2 wells and Well GP-3.
- To monitor VOC concentrations in the OU2 systems and wells.

Table 3 summarizes the pumpage from the OU2 wells and Well GP-3, as well as the VOC mass removed during the second quarter 2001. Details on the rationale and sampling/measurement procedures for OU2 operational monitoring and quarterly monitoring are provided in the 2000 Annual Groundwater Monitoring Report (ARCADIS Geraghty & Miller, Inc. 2001c).

3.1 Pumpage

The design pumping rates (i.e., remedial well pumping rates, determined by groundwater modeling, that would prevent the off-site migration of VOC-impacted groundwater) of OU2 Wells GP-1, ONCT-1, ONCT-2, and ONCT-3 are 1,075 gallons per minute (gpm), 1,000 gpm, 600 gpm, and 700 gpm, respectively (Geraghty &

Miller, Inc. 1996), for a total rate of 3,375 gpm. If the wells were pumped continuously at the design rates, this would result in a total of 442.2 million gallons (MG) being pumped in the second quarter of 2001.

The total pumpage and average pumping rate for each OU2 well during the second quarter 2001 were calculated using methods described in previous quarterly reports. Pumpage from Industrial Supply Well GP-3 supplemented the total gallons pumped during the second quarter 2001. The number of days each OU2 well was operational out of a possible 91 days during the second quarter 2001 and their average pumping rates when operational is provided in Table 3. These periods of operation and average pumping rates equate to approximately 495.4 MG pumped by the OU2 wells during the second quarter 2001, or approximately 112 percent of the total design pumpage given above. Industrial Supply Well GP-3 was operational for nearly all of the second quarter 2001 and pumped at an average rate of 394 gpm; this equates to 51.6 MG pumped in addition to the quantity pumped by the OU2 remedial wells.

Except for Well ONCT-1, the remedial well design pumping rates described above were exceeded this quarter. Well ONCT-1 operated at a rate slightly below the design pumpage rate this quarter, due to a decline in vertical turbine pump performance. Scheduled repairs to the pump motor (the 100 horsepower [HP] motor will be replaced by a 125 HP motor) and attendant electrical components are currently underway and it is anticipated that the design pumping rate will be resumed next quarter. The brief periods of system downtime during this quarter primarily were a result of the performance of routine O&M activities and temporary power outages.

Table 4 summarizes the performance data collected from the OU2 remedial wells for the first and second quarters of 2001. Based on instantaneous pumping rates and drawdowns measured during the second quarter 2001, the specific capacities for the OU2 remedial wells are as follows: GP-1 (23.0 gpm/ft); ONCT-1 (37.2 gpm/ft); ONCT-2 (38.8 gpm/ft); and ONCT-3 (38.8 gpm/ft). For Wells ONCT-1, ONCT-2, and ONCT-3, the specific capacities calculated for the second quarter 2001 exceed the minimum required for the remedial well pumps to operate in their optimum performance range (Geraghty & Miller, Inc. 1996).

3.2 Treatment Plant Operational Data

Treatment system influent data collected by Northrop Grumman (Table 2) shows that the average OU2 treatment system influent TCE concentrations for the second quarter 2001 were as follows: GP-1/3 (503 micrograms per liter [µg/L]) and ONCT (501

µg/L). The ranges of TCE concentrations were as follows: GP-1/3 (370 to 712 µg/L) and ONCT (320 to 665 µg/L). The average OU2 treatment system effluent TCE concentrations were both less than 1 µg/L. Based on the ratio of the average TCE concentrations for the OU2 wells given above to the average TVOC concentrations (data collected by ARCADIS G&M – see below), the average TCE concentration in each OU2 well represents a percentage of the average TVOC concentration (see Table 5). Therefore, based on the average influent and effluent TCE concentrations, treatment removal efficiencies for TVOCs for the GP-1/3 and ONCT systems have been calculated to be 99.9 and 99.8 percent, respectively.

The quarterly monitoring data collected by ARCADIS G&M (Table 10), show that TVOC concentrations in the GP-1/3 system influent and effluent water were 829 µg/L and non-detect, respectively. TVOC concentrations in the ONCT system influent and effluent water were 2,371 µg/L (excluding an acetone detection of 1,400 µg/L, which is likely a laboratory artifact) and non-detect, respectively. As such, the influent TVOC concentration to the ONCT system this round was noted to be higher that the TVOC concentrations of the associated Remedial Wells ONCT-1, ONCT-2, and ONCT-3. TVOC concentrations in the ONCT system influent during the previous two sampling rounds (i.e., fourth quarter 2000 and first quarter 2001) were 1,116 and 610 µg/L, respectively, indicating that the current value is likely an anomalous result. Review of the results of the data validation performed by ARCADIS G&M and the analytical laboratory's internal quality control did not produce a technical reason for this result; monitoring of the ONCT system influent and effluent TVOC concentrations is ongoing and will determine whether this result is a one-time anomaly. The analytical data for the GP-1/3 and ONCT influent and effluent equate to a greater than 99.99 percent removal of VOCs from extracted groundwater for both systems. Overall, the weekly operational data and the quarterly monitoring data presented above show a good correlation regarding the OU2 treatment plant efficiency.

Based on the VOC concentrations and pumping totals from the OU2 remedial wells and Well GP-3, a total of 2,101 pounds (lbs) of VOCs were removed from groundwater and treated by the OU2 treatment facilities during the second quarter of 2001 (Table 3).

4. Groundwater Flow

This report section presents the results of the groundwater level measurements collected during the second quarter 2001 and evaluates the effectiveness of the OU2 groundwater remedy at achieving the goal of preventing the off-site migration of

VOC-impacted groundwater. The evaluation of the hydraulic (i.e., groundwater-level measurement) data is performed using methods described in previous quarterly monitoring reports.

The second quarter 2001 hydraulic measurement round was conducted on May 24, 2001 while the groundwater OU2 was operating; the wells measured and water-level data obtained are summarized in Table 5. During the measurement round, the instantaneous flow rates at the ONCT wells (currently the only wells where an instantaneous flow rate can be measured) were as follows: 826 gpm (ONCT-1); 1,045 (ONCT-2); and 1,024 gpm (ONCT-3). The average pumping rates for the OU2 wells during the week prior to the hydraulic measurement round were as follows: 1,194 gpm (GP-1); 821 gpm (ONCT-1); 1,008 gpm (ONCT-2); and 974 gpm (ONCT-3). During this period, Well GP-3 was pumped at an average rate of 381 gpm. Using the water-level data collected, maps showing the water-table configuration and directions of groundwater flow (i.e., the shallow zone) and the potentiometric surface configuration and groundwater flow directions in the intermediate and D2 zones were prepared. These maps illustrate the effect (i.e., hydraulic containment) of the operation of the OU2 groundwater remedy on horizontal groundwater flow patterns. To evaluate the effect of the OU2 groundwater remedy on vertical groundwater flow patterns, vertical hydraulic gradients were calculated using water-level data from shallow/intermediate, intermediate/deep, and deep/D2 monitoring well clusters; vertical hydraulic gradients are presented in Table 6.

4.1 Shallow Zone

The configuration of the water table and directions of groundwater flow in the shallow zone during the second quarter of 2001 are shown on Figure 2. The effects of the OU2 groundwater treatment plant discharges and stormwater runoff (as recharge to the South Recharge Basins and the Plant 5 Recharge Basins) on shallow groundwater flow during the second quarter 2001 are described below. In addition, this report section also describes vertical hydraulic gradients measured during the second quarter 2001 and compares these gradients to the simulated steady-state vertical gradients predicted by the groundwater flow model (ARCADIS Geraghty & Miller 2000) for when the OU2 remedial wells are preventing the off-site movement of VOC-impacted groundwater (i.e., containment).

As shown on Figure 2, the configuration of the water table on May 24, 2001 shows two areas of groundwater mounding situated on the Northrop Grumman site; one mound is centered on the South Recharge Basins and the other is centered on the Plant 5

Recharge Basins. Additionally, in the south-central portion of the Northrop Grumman site, the horizontal direction of shallow groundwater flow is generally to the south-southeast (i.e., the area between the Plant 5 and South Recharge Basins).

The maximum elevation of the mounding beneath and around the Plant 5 Basins is greater than 70 ft msl. As a result of the mounding, the horizontal direction of shallow groundwater flow in the vicinity of the Plant 5 Basins is radially to the north, south, west, and east away from the basins. This radial horizontal groundwater flow creates a hydraulic barrier that prevents on-site, VOC-impacted groundwater in this area of the shallow zone from migrating off-site. In addition, the groundwater mounding also increases the vertical hydraulic gradient in the vicinity of the Plant 5 Basins, resulting in a downward vertical component of groundwater flow from the shallow zone to the intermediate zone. Using water-level data from the second quarter 2001 round, vertical gradients (Table 6) were calculated for the shallow-intermediate monitoring well clusters in the area of the Plant 5 Recharge Basins (GM-16SR/16I and GM-17SR/GM-17I). As expected, the vertical gradients at these well clusters are oriented downward with the steepest gradient occurring at the Plant 5 Basins (i.e., center of the mounding).

As shown on Figure 2, the maximum elevation of the mound beneath and around the South Recharge Basins is greater than 72 ft msl, and the mound extends across most of the width of the southern boundary of the site. Similar to the situation described above for the Plant 5 Basins, the horizontal direction of shallow groundwater flow in the vicinity of the South Recharge Basins is radially to the north, south, west, and east away from the basins, thereby creating an hydraulic barrier that prevents on-site, VOC-impacted groundwater in this area from migrating off-site in the shallow zone. Similar to the Plant 5 Basins, the mounding around the South Recharge Basins also increases the vertical gradient in the vicinity of the basins, resulting in a downward vertical groundwater flow component from the shallow zone to the intermediate zone. Similar to the Plant 5 Basins area, water-level data for the second quarter 2001 from the shallow-intermediate monitoring well clusters in the area of the South Recharge Basins (GM-19S/GM-19I, GM-15S/GM-15I; GM-21S/GM-21I; GM-78S/GM-78I [Figure 2 and Table 6]) show that the vertical gradients are oriented downward with the steepest gradient at the well cluster nearest the basins (i.e., GM-21S/GM-21I).

Vertical gradients calculated from groundwater elevation data from clustered monitoring wells that are close to groundwater flow model predictions are a key indicator that the OU2 groundwater remedial system, through pumpage from the D2 zone and recharge to the shallow zone, has created an effective hydraulic barrier to off-

site groundwater flow. As shown on Table 6, vertical gradients this quarter in the monitoring well clusters located nearest the South Recharge Basins (GM-19S/GM-19I and GM-21S/GM-21I) are oriented downward and are greater than the gradients predicted by the groundwater flow model. The vertical gradients in Well Clusters GM-15S/GM-15I, GM-16S/GM-16I, and GM-17SR/GM-17I are also oriented downward and are close to model predictions. These data indicate that there is a strong downward vertical component of groundwater flow in the vicinity of the basins from the shallow zone toward the intermediate zone.

In conclusion, the downward vertical gradients coupled with the radial horizontal flow components near the recharge basins collectively create a hydraulic barrier that prevents on-site, VOC-impacted groundwater from migrating off-site in the shallow zone.

4.2 Intermediate Zone

The analysis and interpretation of groundwater flow (horizontal and vertical) in the intermediate zone during the second quarter of 2001 was conducted using the same methods as described in Section 4.1(Shallow Zone) above. The configuration of the potentiometric surface and groundwater flow directions in the intermediate zone during the second quarter of 2001 are shown on Figure 3. Table 6 summarizes vertical gradient calculations for intermediate/deep wells.

As shown on Figure 3, the configuration of the potentiometric surface in the intermediate zone is similar to the water-level configuration observed in the shallow zone, with mounding centered beneath the Plant 5 and South Recharge Basins (maximum water-level elevation at the Plant 5 Basins is greater than 70 ft msl, while the maximum water-level elevation at the South Recharge Basins is greater than 68 ft msl). This indicates that the OU2 groundwater treatment system discharge and stormwater runoff (as recharge to these basins) are substantially affecting groundwater flow in the intermediate zone, with the horizontal component of flow nearest the basins oriented radially away from the basins. The resultant vertical gradients in monitoring well clusters at the site (i.e., GM-15I/GM-15D, GM-17I/GM-17D, GM-20I/GM-20D, and GM-74I/GM-74D) are oriented downward and are similar to or greater than model predictions.

Collectively, these data indicate that the hydraulic barrier to groundwater flow extends vertically downward to the intermediate zone and is similar in extent to that observed

in the shallow zone, thereby preventing the off-site migration of VOC-impacted groundwater in the intermediate zone.

4.3 Deep Zone

As stated in previous reports, since groundwater in the deep zone is expected to be flowing in a predominantly vertical (downward) direction in the general vicinity of the OU2 remedial wells/Plant 5 and South Recharge Basins, the analysis of the effectiveness of the OU2 remedial wells at achieving the goals in this zone is conducted using vertical gradient calculations for deep/D2 monitoring well clusters. Table 6 summarizes the vertical hydraulic gradients calculated from data collected from well clusters in the deep/D2 zones during the second quarter 2001 round and compares them to model-predicted gradients.

As expected, the vertical gradients in on-site Well Clusters GM-15D/GM-15D2 (east of the South Basins) and GM-74D/GM-74D2 (at the South Basins) are oriented downward and are greater than model predictions. For deep/D2 well clusters located generally south (off-site) of the Northrop Grumman site property boundary, vertical gradients were also calculated based on the second quarter 2001 data and are oriented downward and are greater than the model-predicted gradients.

In conclusion, vertical hydraulic gradients calculated for the second quarter 2001 from deep/D2 monitoring well clusters are oriented downward and are greater than steady-state gradients predicted by the groundwater flow model. Furthermore, vertical gradients in well clusters near the Northrop Grumman site boundary indicate that the mounding of the water table coupled with pumping wells in the D2 zone is forcing on-site groundwater downward toward the pumpage in the D2 zone, and prevents groundwater from flowing off-site in the deep zone.

4.4 D2 Zone

On May 24, 2001, water-levels were measured in on- and off-site D2 monitoring wells and OU2 Remedial Wells GP-1, ONCT-1, ONCT-2, and ONCT-3 which are screened in the D2 zone. Figure 4 depicts the potentiometric surface configuration and groundwater flow directions in the D2 zone under pumping conditions.

The result of pumping the OU2 remedial wells and Well GP-3 is the formation of cones of depression (areas of depressed water levels) in the D2 zone centered on each well that coalesce into one large zone of capture that extends along the entire southern

property boundary and also extends northwest along the western boundary of the Northrop Grumman site (see Figure 4). Although a water level cannot currently be measured in Well GP-3, it is reasonable to assume that the cone of depression around this well causes the cumulative zone of capture shown on Figure 4 to extend further to the northwest than is currently shown on Figure 4. At its farthest downgradient extent (south of Well ONCT-1) the zone of capture extends approximately 900 ft south of the Northrop Grumman site boundary. Within the zone of capture (upgradient and up to 900 ft downgradient of the OU2), groundwater flow directions are oriented toward the centers of pumping indicating that groundwater in this area is fully contained and captured by the OU2 groundwater remedial system. Beyond the downgradient extent of the zone of capture, groundwater continues to flow downgradient until it is influenced by the pumping of nearby public supply wells or continues to flow south-southeast in the direction of regional groundwater flow.

Collectively, the data from the D2 zone indicate that the pumpage of the OU2 remedial wells has created a hydraulic barrier in this zone, thereby preventing the off-site migration of VOC-impacted groundwater across the entire southern boundary of the Northrop Grumman site.

4.5 Summary of Groundwater Flow Conditions

In conclusion, the hydraulic data presented in this quarterly report is similar to data in previous reports and indicate that operation of the OU2 groundwater remedial system has maintained an effective hydraulic barrier throughout the shallow, intermediate, deep, and D2 zones, which prevents the off-site migration of on-site, VOC-impacted groundwater.

5. Groundwater Quality

The second quarter 2001 groundwater sampling round was conducted from April 30 to June 21, 2001. In the following subsections of this report, the distribution of VOCs in the shallow, intermediate, deep, and D2 zones is described and VOC concentrations are compared to New York State Standards, Criteria, and Guidance Values (SCGs). Furthermore, this rounds water quality results are also compared to the results of the previous groundwater monitoring round. The occurrence and distribution of VCM in groundwater is discussed in Section 5.2 (Vinyl Chloride Monomer) of this report.

5.1 Volatile Organic Compounds

The goal of the on-site OU2 groundwater pump and treat system is to capture, remove, and treat groundwater from the on-site portion of the VOC plume and, thereby prevent VOC-impacted groundwater from moving off-site. The operation of the OU2 groundwater remedy will cause the plume to bifurcate into an on-site portion and an off-site portion. As treated groundwater and precipitation continue to recharge the aquifer a clean zone will develop between the on- and off-site portions of the bifurcated plume, within which VOC impacts will not occur or will be minimal. This clean zone will increase in size as VOC-impacted groundwater downgradient (south) and beyond the capture zone of the OU2 wells continues to migrate through the aquifer in the regional direction of groundwater flow to the south-southeast. The continued growth of this clean zone will be dependant upon maintaining the hydraulic barrier created by the OU2 groundwater pump and treat system, and the rate of growth will largely depend on the regional groundwater velocity, which is generally less than one foot per day in the Magothy aquifer.

Based on the above considerations, groundwater samples collected from wells immediately south (off-site) of the OU2 remedial wells will be the first to show water quality improvement (i.e., a decreasing trend in contaminant concentrations over time) although the improvement due to the natural slow groundwater velocity will be slow to occur. Monitoring wells located further downgradient will take a longer time to show an improvement in groundwater quality, as compared to wells immediately south of the OU2 remedial wells due to the relatively slow groundwater velocity.

VOC-impacted groundwater that migrated off-site prior to the implementation of the OU2 groundwater remedy would have to migrate past off-site monitoring wells before the wells would show groundwater quality improvement related to operation of the OU2 remedial system. Depending on the contaminant concentrations and heterogeneity of the off-site groundwater, monitored water quality in off-site wells may show several trend changes before long-term trends associated with the operation of the OU2 remedial system are revealed.

Depending on the exact location of the well, water quality in on-site wells may either increase, decrease, or stay the same over the short to mid-term, but over the long term a general decrease in VOC concentrations will be observed.

The following subsections of this report focus on the on- and off-site detections of VOCs in groundwater samples collected.

5.1.1 VOCs in the Shallow and Intermediate Zones

Groundwater monitoring data from the shallow and intermediate monitoring wells are summarized in Tables 7 and 8. In general, the data from the shallow and intermediate wells sampled this quarter confirm that the operation of the OU2 groundwater remedial system has formed an effective hydraulic barrier that prevents the off-site movement of VOC-impacted groundwater in the shallow and intermediate zones. A detailed discussion of the water quality data for the shallow and intermediate zones follows.

Of the 13 shallow wells sampled this quarter, six wells exhibited no VOCs detected, six wells exhibited TVOC values ranging from 0.4 µg/L to 15 µg/L, and one well (FW-03) exhibited a TVOC concentration of 56.1 µg/L (Table 7). TCE was the main constituent detected in each well with detectable VOC concentrations. The SCG for TCE (5 µg/L) was exceeded in Wells GM-15S and FW-03; the SCG for tetrachloroethene (PCE) (5 µg/L) was exceeded in Well FW-03. No other shallow wells exhibited SCG exceedences. Well FW-03, located over 4,000 ft north and upgradient of the OU2 remedial wells (Figure 1) exhibited the highest TVOC result, as was the case the previous sampling round. With the exception of Wells FW-03 and GM-15S, results this round for other shallow wells sampled are essentially the same as last round. Wells FW-03 and GM-15S exhibited TVOC concentrations that were approximately twice the values detected last round with the same compounds detected both rounds. Wells N-10631, N-10634, GM-17SR, and GM-21S which exhibited non-detectable or only trace (i.e., less than 1 µg/L) VOC concentrations this quarter, are located at or downgradient of the South Recharge Basins/Plant 5 Recharge Basins and attest to the effectiveness of the hydraulic barrier in preventing VOC-impacted groundwater from migrating off-site in the shallow zone.

All 13 intermediate wells sampled this round exhibited essentially the same results and compounds detected (i.e., PCE; TCE; 1,1,1-TCA; 1,2-DCE; 1,1-DCE; and 1,1-DCA) as last quarter (Table 8). In general, there were similar breakdown products (i.e., 1,2-DCE; 1,1-DCE; and 1,1-DCA) detected this round. Of the 13 intermediate wells sampled, six exhibited non-detectable or trace concentrations of VOCs, and four wells exhibited TVOC concentrations ranging from 2.9 µg/L to 5.1 µg/L with no exceedences of SCGs. Well GM-16I exhibited a TVOC concentration of 31 µg/L and Well HN-24I exhibited a TVOC concentration of 244 µg/L. The VOC results for both wells were similar to or less than the previous round. TCE was detected in Wells GM-16I and HN-24I exceeding the SCG of 5 µg/L at concentrations of 21 µg/L and 180 µg/L, respectively. Other VOCs detected in Well HN-24I exceeding their respective SCGs of 5 µg/L included 1,1-DCE; 1,1-DCA; 1,2-DCE (total); 1,1,1-TCA; and PCE.

At the Northrop Grumman southern boundary, Wells GM-15I, GM-17I, GM-18I, GM-20I, GM-21I, GM-74I, and GM-79I which exhibited no exceedences of SCGs this quarter. Similar to the shallow zone, intermediate wells with exceedences of SCGs and the highest TVOC concentrations (i.e., Wells GM-16I and HN-24I) were located upgradient of the OU2 groundwater remedial systems and wells with no or few VOC detections were located at or immediately south of the Northrop Grumman southern property boundary, attesting to the effectiveness of the hydraulic barrier at preventing VOC-impacted groundwater from migrating off-site in the intermediate zone.

5.1.2 VOCs in the Deep Zone

Groundwater monitoring data from deep monitoring wells are summarized in Table 9. In general, the data from the deep wells sampled this quarter supports the conclusion developed for the shallow and intermediate zones and confirms that the OU2 groundwater remedial system formed an effective the hydraulic barrier and prevents the off-site movement of VOC-impacted groundwater in the deep zone. A detailed discussion of the water quality data for the deep zone follows.

Of the 13 deep wells sampled this quarter, four wells exhibited non-detectable or trace concentrations of VOCs with no exceedences of SCGs (Table 9). Seven wells exhibited TVOC concentrations ranging from 18.3 µg/L to 150.5 µg/L. In these seven wells, TCE and 1,1-DCA were the compounds that exceeded SCGs. The majority of these seven wells are located south of the Northrop Grumman site. The two remaining wells had substantially higher TVOC concentrations, as follows: Well GM-13D exhibited a TVOC concentration of 1,441 µg/L (PCE; TCE; 1,1-DCE; 1,1-DCA; 1,2-DCE [total]; and 1,1,1-TCA exceeded SCGs) and Well GM-38D exhibited a TVOC concentration of 675 µg/L (TCE and 1,1-DCA exceeded SCGs).

Furthermore, eleven of the thirteen deep wells sampled this round exhibited essentially the same VOC results and compounds detected exceeding SCGs as last round, while Well GM-38D exhibited an increase in VOC concentration and Well GM-74D exhibited a decrease in VOC concentration in comparison to last round.

Well GM-13D is located on the Northrop Grumman site, upgradient of the OU2 system and Well GM-38D is located in the off-site area; both wells have historically exhibited persistent elevated VOC concentrations in the deep zone (see Figure 1). Three of the four wells that exhibited trace or non-detectable VOC concentrations (GM-17D, GM-18D, GM-20D) are located along the Northrop Grumman site boundary, with the fourth well (HN-29D), located on the NWIRP site. Wells N-10627,

GM-15D, and GM-74D, located along or near the Northrop Grumman southern boundary and Wells GM-34D, GM-36D, and GM-37D located more than 2,000 ft downgradient of the southern boundary of the Northrop Grumman site, exhibited VOC concentrations similar to or less than the previous round (Figure 1). Collectively, the data indicate stable VOC concentrations in the deep zone on and near the site and specifically, Wells GM-17D, GM-18D, and GM-20D confirm that the OU2 groundwater remedial system formed an effective the hydraulic barrier and prevents the off-site movement of VOC-impacted groundwater in the deep zone.

5.1.3 VOCs in the D2 Zone

Groundwater monitoring data from the D2 zone are summarized in Table 10. As stated in Section 3 (OU2 Operational Monitoring) of this report, Northrop Grumman collected weekly operational water samples from the OU2 remedial wells and treatment systems and analyzed the samples for select VOCs (i.e., TCE or TCE/VCM). ARCADIS G&M collected quarterly groundwater samples from OU2 Wells GP-1, ONCT-1, ONCT-2, ONCT-3 and Industrial Well GP-3 and influent/effluent water samples from the Plant 5 (GP-1) and Plant 5E (ONCT) systems. In addition, ARCADIS G&M collected groundwater samples from the network of D2 monitoring wells listed in the groundwater monitoring plan. All quarterly water samples were analyzed for the TCL VOCs. The following subsection of this report describes the results of this round of monitoring of the OU2 remedial wells, compares the weekly operational data to the quarterly monitoring data and to the previous groundwater monitoring round results, describes the VOC analytical results from the D2 monitoring wells, and compares the results from the monitoring wells to SCGs and the results from the previous groundwater monitoring round.

5.1.3.1 OU2 System

As shown on Table 1, the average TCE concentrations in each of the OU2 remedial wells and Industrial Supply Well GP-3 from the weekly operational samples for the second quarter of 2001 are as follows: GP-1 (314 µg/L); GP-3 (1,076 µg/L); ONCT-1 (1,060 µg/L); ONCT-2 (118 µg/L); and ONCT-3 (12 µg/L). The corresponding ranges of TCE concentrations are as follows: GP-1 (218 to 412 µg/L); GP-3 (671 to 1,373 µg/L); ONCT-1 (800 to 1,352 µg/L); ONCT-2 (96 to 147 µg/L); and ONCT-3 (9 to 15 µg/L). Compared with the prior round of data (which included samples collected from January through March 2001), the average TCE concentrations in the OU2 remedial wells have decreased, with the exception of Well ONCT-3, where TCE concentrations have remained essentially unchanged.

From the quarterly monitoring of the OU2 remedial wells and industrial supply wells pumping to the Plant 5 system, TVOC concentrations in OU2 Remedial Well GP-1 (595 µg/L) and Industrial Supply Well GP-3 (1,920 µg/L) have increased in comparison to the previous round. From the quarterly monitoring of the OU2 remedial wells pumping to the ONCT system, TVOC concentrations in OU2 Remedial Wells ONCT-1, ONCT-2, and ONCT-3 (1,513 µg/L; 218 µg/L; and 35.2 µg/L) have also increased in comparison to the previous round. Overall, the quarterly monitoring data indicate higher TVOC concentrations in comparison to the weekly operational data this round. Section 3.2 (Treatment Plant Operational Data) includes an evaluation of OU2 system treatment plant efficiency, based on the weekly and quarterly data.

5.1.3.2 Monitoring Wells

With the exception of Monitoring Well GM-33D2, VOC concentrations in the D2 zone (Table 10) have remained essentially the same or have increased in comparison to the previous groundwater monitoring round. Near the site southern boundary, VOC concentrations in Wells GM-15D2 (22.6 µg/L) (TCE and PCE exceeded SCGs) and GM-74D2 (10.3 µg/L) (no exceedences) have remained essentially the same as the previous round. Well GM-33D2 (552 µg/L) (TCE and PCE exceeded SCGs), located near Well ONCT-1 exhibited lower VOC concentrations in comparison to the previous round. The decline in VOC concentrations in this well in comparison to the previous round appears to indicate that the OU2 groundwater remedial system continues to be effective in reducing VOC concentrations in the D2 zone in the area. Well GM-73D2 (877 µg/L) (TCE exceeded its SCG) exhibited an increase in VOC concentration this round. Well GM-75D2 (1,244 µg/L) (TCE exceeded the SCG) was sampled for the first time this round, so no comparison can be made. Excluding the GM-38 Area, off-site VOC concentrations in the D2 zone ranged from non-detect in Well GM-36D2 to 213 µg/L in Well GM-35D2 with four of the six wells exhibiting VOC concentrations essentially the same in comparison to the previous round. The remaining two wells, Wells GM-34D and GM-35D2, exhibited an increase in VOC concentrations this round. Similar to last round, TCE was the compound most frequently detected off-site in the D2 zone exceeding the SCG; other VOCs detected less frequently at concentrations exceeding SCGs included PCE; 1,1-DCE; 1,1-DCA; and 1,2-DCE (total). The VOC concentration in the D2 zone in the GM-38 Area (1,112 µg/L in Well GM-38D2) has increased in comparison to the previous round, with TCE and 1,2-DCE (total) exceeding SCGs this round.

As stated above, continued monitoring of water quality in off-site wells may show several trend changes before a long-term trend associated with OU2 operation is revealed.

5.2 Vinyl Chloride Monomer

Groundwater monitoring of the VCM subplume emanating from the RUCO Polymer site (near the NWIRP area) is performed by sampling Monitoring Wells GM-23S, GM-23I, MW-52S, MW-52I, and MW-52D on a semi-annual basis (twice yearly); other monitoring wells used in part as outpost wells to monitor the position of the VCM subplume which are monitored on a quarterly basis include Wells GM-17S, GM-17I, GM-17D, GM-18S, GM-18I, and GM-18D (these six wells are also sampled as part of monitoring the effectiveness of the OU2 groundwater remedial system). However, VCM is a parameter that is monitored in all wells sampled for VOCs and Section 5.1 (Volatile Organic Compounds) of this report provides a complete discussion of other VOCs detected in the VCM monitoring well network. This section discusses the results of the second quarter 2001 monitoring round and compares these results to those of the previous round. Tables 7 through 10 provide the results for VCM concentrations in groundwater for the second quarter 2001 and the previous round.

VCM was not detected in the shallow, intermediate, or deep zones (Tables 7 through 9) during the second quarter of 2001. In the D2 zone, based on the operational sampling conducted by Northrop Grumman, VCM was detected in Well GP-3 above the SCG of 2 µg/L at concentrations ranging from 4.6 µg/L to 10.2 µg/L (Table 1). VCM was detected in Well GP-3 (10 µg/L) above the SCG as part of the second quarter 2001 sampling round performed by ARCADIS G&M (Table 10). Since Well GP-3 is located substantially farther south (downgradient) than the upgradient VCM monitoring well network and it is deeper than any monitoring well in the network, it is reasonable to conclude that the extent of the VCM subplume is greater than previously defined by RUCO. VCM was not detected in any other D2 zone well (Table 10).

5.3 Tentatively Identified Compounds

For all groundwater samples collected during this round, in addition to the TCL VOCs, the laboratory was requested to perform an analysis and library search to identify and evaluate whether volatile Tentatively Identified Compounds (TICs) exist in the groundwater samples. TICs detected in groundwater samples collected during the second quarter 2001 round are summarized in Table 11. Overall, six TICs were

identified at estimated concentrations ranging from 0.37 µg/L to 150 µg/L. Since the laboratory instruments cannot be calibrated to determine exact TIC concentrations (i.e., they are not included in the TCL VOC list), the concentrations should be used for qualitative purposes only.

5.4 Quality Control Samples - VOCs

Based on the analytical results (Table 12) for the second quarter 2001 round, low levels of VOCs (e.g., acetone and methylene chloride) were detected. Modifications made to the analytical results for the second quarter 2001 round are discussed in Section 5.8 (Data Validation).

5.5 Semi-Volatile Organic Compounds

The second quarter 2001 round groundwater data for the shallow monitoring Well GM-14, located downgradient of the Plant 1 Fuel Depot, are provided in Table 13. SVOCs were not detected this round, which was also the case in the previous round.

5.6 Cadmium and Chromium

Groundwater monitoring data from shallow and intermediate monitoring wells for the second quarter 2001 and the previous round for total cadmium (Cd) and total chromium (Cr) are provided in Table 14. The data were compared to SCGs. The cadmium concentration in Monitoring Well MW-3R (27.6 µg/L) exceeded the SCG of 5 µg/L; concentrations have decreased since the last monitoring round. Cadmium was detected below the SCG in Monitoring Well N-10631 (2.5 µg/L), Well GM-16SR (not detected) and is essentially the same in both wells in comparison to the results from the previous monitoring round. Cadmium was also not detected in Wells GM-78S and GM-18I; this is the first time these wells have been sampled. The chromium concentration in Monitoring Well MW-3R (69.7 µg/L) exceeds the SCG of 50 µg/L; the concentration is essentially the same in comparison to the last monitoring round. Chromium was detected at the SCG in Well N-10631 (50 µg/L) and below the SCG in Well GM-16SR (2.9 µg/L) this round. The chromium concentration in Well N-10631 has increased in comparison to the result from the previous round, while the concentration in Well GM-16SR has remained essentially the same. The chromium concentration in Wells GM-78S and GM-78I were below the SCG.

5.7 Quality Control Samples - Cadmium/Chromium

Cadmium/chromium were not detected in the equipment blank samples collected in the second quarter 2001 round (Table 14).

5.8 Data Validation

ARCADIS G&M performed validation of the groundwater quality data (including TICs) collected from monitoring wells by following the contract laboratory program national functional guidelines for organic and inorganic data review (USEPA 1994). The quality of the data is considered acceptable with the appropriate qualifications indicated on Tables 7 through 14. Data validation memoranda are provided in Appendix D.

6. Findings and Conclusions

6.1 OU2 System

1. Overall a total of 495.4 MG were pumped and treated by the OU2 groundwater remedial system during the second quarter 2001, which is approximately 112 percent of the total design pumpage. Pumpage of Well GP-3 supplemented the total gallons pumped by an additional 51.6 MG.

2. OU2 remedial well specific capacity remains above the minimum values required for optimum pump performance.

3. During the second quarter 2001, a total of 2,101 lbs of VOCs were removed from the aquifer and treated by the OU2 groundwater treatment facilities. Based on the weekly water quality data collected by Northrop Grumman, the average TVOC concentration in the OU2 wells has decreased or remained the same in comparison to the previous round. Based on the average influent and effluent TCE concentrations and the ratio of TCE to TVOC concentrations this quarter, treatment removal efficiencies for TVOCs for the GP-1/3 and ONCT systems have been calculated to be 99.9 and 99.8 percent, respectively. Based on samples collected by ARCADIS G&M from the OU2 wells and OU2 system, VOC removal efficiency for both treatment plants is greater than 99.99 percent.

6.2 Groundwater Flow

1. Water-level data in the shallow and intermediate zones from the second quarter 2001 indicate that operation of the OU2 groundwater remedial system has maintained the groundwater mounding in the Plant 5 Recharge Basins and the South Recharge Basins areas and overall conditions are consistent with the prior round. Consequently, the hydraulic barrier in the shallow zone has been maintained, and extends to the immediate zone and prevents the off-site migration of on-site VOC-impacted groundwater in the these zones.

2. Downward vertical hydraulic gradients near the Plant 5 Recharge Basins and South Recharge Basins areas remain close to or greater in magnitude than those predicted by the groundwater flow model and result in downward groundwater movement. This indicates that the mounding of the water table coupled with pumpage from the D2 zone is continuing to force on-site groundwater to move downward toward the OU2 remedial wells in the D2 zone, which prevents VOC-impacted groundwater from flowing off-site in the deep zone.

4. The configuration of the potentiometric surface in the D2 zone indicates that the zone of capture, due to pumpage of the OU2 remedial wells extends across the entire Northrop Grumman southern property boundary and to the northwest toward Well GP-3 and continues to fully control and contain groundwater on-site and more than 900 ft south of the site.

6.3 Groundwater Quality

1. As expected, the analytical results from shallow and intermediate monitoring wells in areas within the VOC plume on the Northrop Grumman and NWIRP sites upgradient of the OU2 groundwater remedial system exhibited the highest concentrations of VOCs in these zones. At the southern property boundary and immediately south of it, shallow and intermediate monitoring wells exhibited stable low or non-detectable concentrations of VOCs. These results confirm the effectiveness of the OU2 groundwater remedial system in preventing the off-site migration of VOC-impacted groundwater in the shallow and intermediate zones.

2. Deep wells along the Northrop Grumman site perimeter exhibit low to non-detectable VOC concentrations. The pumpage of the OU2 remedial wells is the reason for the low to non-detectable VOC concentrations, which attest to the effectiveness of the OU2 remedial system in preventing the off-site migration of

VOC-impacted groundwater in the deep zone. Further downgradient of the sites (i.e., in off-site areas), TVOC concentrations are unchanged in comparison to the previous round, except for Well GM-38D, where an increase in VOC concentrations was noted.

3. In the D2 zone, Well GM-33D2 which is the closest monitoring well to OU2 Remedial Well ONCT-1, exhibited a continued decrease in VOC concentrations, which indicates that the OU2 remedial system continues to be effective in reducing VOC concentrations in the D2 zone in this area. Off-site, VOC concentrations in the D2 zone have remained essentially the same or have increased in comparison to the previous round. Continued monitoring of water quality in off-site wells may show several trend changes before a long-term trend associated with the OU2 remedial system operation is revealed.

5. VCM was not detected in the shallow, intermediate, or deep zones. Well GP-3, screened in the D2 zone, exhibited the only detection of VCM; this detection exceeded the SCG, and indicates that the extent of the VCM subplume (horizontal and vertical) is greater than previously defined by RUCO.

6. VOCs and SVOCs were not detected above SCGs downgradient of the Plant 1 Fuel Depot.

7. Cadmium was detected above the SCG in Well MW-3R and the concentration has decreased compared to the result from the previous round. Cadmium concentrations in Wells N-10631 and GM-16SR were below the SCG and are essentially unchanged in comparison to the previous round. Cadmium was detected below the SCG in Wells GM-78S and GM-78I (not detected). Chromium was detected above the SCG in Well MW-3R and the concentration is essentially unchanged in comparison to the previous round. Chromium concentrations were at or below the SCG in Wells GM-16SR and N-10631 this round and the concentration has increased in Well N-10631 in comparison to the results from the previous round, while the concentration in Well GM-16SR is essentially unchanged. The chromium results form Wells GM-78S and GM-78I were below the SCG.

7. Recommendations

ARCADIS G&M does not recommend any additional changes or modifications to the groundwater monitoring program at this time.

8. References

ARCADIS Geraghty & Miller, Inc. 2001a. Operable Unit 2 Groundwater Monitoring Plan. Northrop Grumman Corporation, Bethpage, New York. May 11, 2001.

ARCADIS G&M, Inc. 2001b. First Quarter 2001 and Groundwater Quality Monitoring Report, Northrop Grumman Corporation, Bethpage, New York. December 10, 2001.

ARCADIS G&M, Inc. 2001c. 2000 Annual Groundwater Monitoring Report, Northrop Grumman Corporation, Bethpage, New York. October 19, 2001.

ARCADIS Geraghty & Miller, Inc. 2000. Groundwater Feasibility Study, Grumman Aerospace - Bethpage, New York Site (#130003A) and Naval Weapons Industrial Reserve Plant, Bethpage, New York Site (#130003B). October 16, 2000.

Geraghty & Miller, Inc. 1996. Groundwater Interim Remedial Measure Ninety Percent Design Report, Grumman Aerospace Corporation, Bethpage, New York. January 1996.

Grumman Aerospace Corporation. 1986. Water Well Recovery System Specifications. February 1986.

New York State Department of Environmental Conservation (NYSDEC). 1998. Division of Water Technical and Operation Guidance Series (TOGS 1.1.1). Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. Promulgated October 22, 1993. Re-issued June 1998.

New York State Department of Environmental Conservation (NYSDEC). 1990. Operation, Maintenance, and Monitoring Manual for a Hazardous Waste Site. April 20, 1990.

U.S. Environmental Protection Agency (USEPA). 1999. Contract Laboratory Program National Functional Guidelines for Organic Data Review. October 1999.

U.S. Environmental Protection Agency (USEPA). 1994. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. February 1994.

ARCADIS

Table 1. Select VOC Concentrations in Water Samples Collected from OU2 Remedial Wells and Industrial Supply Wells, Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.[1]

		OU2 REMEDIAL WELLS				INDUSTRIAL SUPPLY WELLS					
Sample Collection Date	Well ID:	GP-1		ONCT-1	ONCT-2	ONCT-3	GP-3		GP-10		GP-11	
	Units:	(ug/L)		(ug/L)	(ug/L)	(ug/L)	(ug/L)		(ug/L)		(ug/L)	
	Constituent:	VCM	TCE	TCE	TCE	TCE	VCM	TCE	VCM	TCE	VCM	TCE
4/4/01		<0.5	374	1,352	103	13	7.3	1,058	NS	NS	NA	20
4/11/01		<0.5	320	1,316	124	15	8.4	1,373	NS	NS	NA	27
4/18/01		<0.5	400	1,152	118	15	6.5	1,284	NS	NS	NA	32
4/24/01		<0.5	354	NA	NA	NA	8.7	1,200	NS	NS	NA	31
5/3/01		<0.5	412	1,081	123	12	7.1	1,052	NA	60	NS	NS
5/9/01		<0.5	228	1,189	96	13	7.0	671	NA	60	NS	NS
5/16/01		<0.5	303	1,040	114	13	2.7	970	NA	78	NS	NS
5/22/01		<0.5	323	903	112	10	8.1	1,040	NA	50	NS	NS
5/29/01		<0.5	378	918	128	14	10.2	1,018	NA	96	NS	NS
6/5/01		<0.5	263	1,008	121	11	10.2	1,179	NA	94	NS	NS
6/12/01		<0.5	218	911	130	11	9.9	876	NA	78	NS	NS
6/20/01		<0.5	224	800	101	9	9.1	981	NA	58	NS	NS
6/27/01		<0.5	289	1,050	147	10	4.6	1,282	NA	71	NS	NS
Average Concentration:		<0.5	314	1,060	118	12	8	1,076	--	72	--	28

(1) Water samples were collected and analyzed for TCE and VCM by Northrop Grumman; results were not validated.

VOC Volatile Organic Compound
OU2 Operable Unit 2
ug/L Micrograms per liter
TCE Trichloroethene
VCM Vinyl Chloride Monomer
NS Not sampled; well not operating.
NA Not Analyzed
-- Not Applicable

Table 2. Select VOC Concentrations in Water Samples Collected from the OU2 System Influent and Effluent, Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York. [1]

Sample Collection Date	Sample ID:	ONCT System (WWRP-5E) Influent	ONCT System (WWRP-5E) Effluent	GP-1 System (WWRP-5) Influent		GP-1 System (WWRP-5) Effluent	
	Units:	(ug/L)	(ug/L)	(ug/L)		(ug/L)	
	Constituent:	TCE	TCE	VCM	TCE	VCM	TCE
4/4/01		528	0.5	0.6	563	NA	<0.5
4/11/01		378	1.0	2.1	712	NA	1.2
4/18/01		478	1.1	0.8	573	NA	0.5
4/24/01		477	<0.5	0.7	477	NA	<0.5
5/3/01		477	1.2	0.5	518	NA	0.5
5/9/01		503	1.6	0.8	370	NA	0.6
5/16/01		665	1.6	0.7	378	NA	<0.5
5/22/01		320	0.5	1.3	512	NA	<0.5
5/29/01		392	0.5	<0.5	444	NA	<0.5
6/5/01		472	<0.5	1.7	446	NA	0.6
6/12/01		548	<0.5	1.1	486	NA	<0.5
6/20/01		640	<0.5	1.5	382	NA	<0.5
6/27/01		640	<0.5	<0.5	675	NA	<0.5
Average Concentration:		501	0.6	1	503	NA	0.3

[1] All water samples were collected and analyzed by Northrop Grumman; results were not validated.

VOC	Volatile Organic Compound
OU2	Operable Unit 2
TCE	Trichloroethene
VCM	Vinyl Chloride Monomer
ug/L	Micrograms per liter
WWRP	Wastewater Recovery Plant
WWRP-5E	WWRP 5E system influent and effluent consists of water from OU2 Remedial Wells ONCT-1 (Well 17), ONCT-2 (Well 18), and ONCT-3 (Well 19).
WWRP5	WWRP 5 system influent and effluent consists of water from Remedial Well GP-1, with intermittent pumpage from Industrial Supply Wells GP-3, GP-10, and GP-11.
NA	Not Analyzed

ARCADIS

Table 3. Operational Summary of the OU2 Remedial Wells and Industrial Supply Well GP-3, Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

Well/System Identification	Average Pumping Rate [a] (gpm)	Total Pumpage (a) (MG)	Design Pumpage (MG)	Percent of Design Pumpage	Average Influent TCE Concentration (ug/L)	Average Influent TVOC Concentration [b] (ug/L)	TVOC Mass Removed [b] (lbs)
OU2 Wells							
GP-1	1,195	156.6	140.9	111.2%	314	374	488
ONCT-1	843	110.5	131.0	84.3%	1,060	1,071	985
ONCT-2	814	106.7	78.6	135.7%	118	128	114
ONCT-3	928	121.5	91.7	132.5%	12	21	22
Industrial Supply Well							
GP-3	394	51.6	--	--	1,076	1,144	492
TOTALS: [c]	**--**	**495.4**	**442.2**	**112%**	**--**	**--**	**2,101**

Notes:

(a) - Average pumping rate and total pumpage (rounded to the nearest tenth) based on Northrop Grumman records of operation from April 1 to June 30, 2001.
- Days wells were operational from April 1 to June 30 out of a possible 91 days are as follows: OU2 Well GP-1 (91); OU2 Well ONCT-1 (85.9); OU2 Well ONCT-2 (85.8); OU2 Well ONCT-3 (85.9); Supply Well GP-3 (91).
- Pumping rates accurate to +/-15% due to limitations in flow metering.

(b) - TVOC concentration and TVOC mass in each well were estimated from second quarter 2001 groundwater monitoring data which indicated that TCE concentrations were a percentage of the TVOC concentration, as follows: GP-1 (84 percent); ONCT-1 (99 percent); ONCT-2 (92 percent); ONCT-3 (57 percent); and GP-3 (94 percent).

- TVOC mass removed during the second quarter 2001 was based on the TCE/TVOC ratios given above and the following formula:

$$\frac{(\text{TCE concentration [ug/L]}) \times (\text{gallons pumped}) \times (3.785\ \text{L/gal}) \times (1 \times 10^{-6}\ \text{g/ug}) \times (2.2 \times 10^{-3}\ \text{lb/g})}{(\text{TCE concentration} / \text{TVOC concentration})}$$

(c) TVOC mass removed includes the OU2 wells and Well GP-3. Other totals include OU2 wells only.

OU2	Operable Unit 2
gpm	gallons per minute
MG	Million Gallons
ug/L	micrograms per liter
lbs	pounds
--	Not Available or Not Applicable
TCE	Trichloroethene
TVOC	Total Volatile Organic Compound
L/gal	Liters per gallon
g/ug	grams per microgram
lb/g	pounds per gram

Table 4. OU2 Remedial Well Performance Data, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

OU2 Well Identification	Baseline Round Static Depth to Water 5/9/1997 [1] (ft bmp)	Last Two Water-Level Measurement Dates	Pumping Depth to Water (ft bmp)	Pumping Rate (gpm)	Drawdown (ft)	Specific Capacity [2] (gpm/ft)
ONCT-1	44.12	February 20, 2001	69.15	1098	25.03	43.9
		May 24, 2001	66.33	826	22.21	37.2
ONCT-2	50.15	February 20, 2001	80.45	1125	30.30	37.1
		May 24, 2001	77.05	1045	26.90	38.8
ONCT-3	49.13	February 20, 2001	66.00	607	16.87	36.0
		May 24, 2001	75.54	1024	26.41	38.8
GP-1	55.75	February 20, 2001	--	783*	--	--
		May 24, 2001	96	1150	40.25	28.6

(1) Static depth to groundwater in Well GP-1 was measured in February 27, 2001 while the vertical turbine pump was not in operation.

(2) Specific capacity is calculated by dividing the pumping rate by the drawdown.

OU2	Operable Unit 2
gpm	gallons per minute
ft bmp	feet below measuring point
--	Data could not be collected
*	Based on pumpage data collected by Northrop Grumman personnel
ft	feet
gpm/ft	gallons per minute per foot of drawdown

ARCADIS

Table 5. Water-Level Measurement Data, Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

Well Designation	Measuring Point Elevation (ft msl)	Depth to Water May 24, 2001 (ft bmp)	Water-Level Elevation May 24, 2001 (ft msl)
Shallow Wells			
N-9921	94.23	33.89	60.34
N-10597	109.85	43.39	66.46
N-10600	102.41	40.28	62.13
N-10631	103.47	40.38	63.09
N-10633	103.80	39.22	64.58
N-10634	101.20	41.14	60.06
N-10821	91.58	35.49	56.09
GM-15S	109.35	46.02	63.33
GM-16SR	115.77	49.54	66.23
GM-17SR	115.79	45.32	70.47
GM-18S	107.60	42.77	64.83
GM-19S	109.86	43.47	64.41
GM-21S	105.81	33.81	72.00
GM-78S	104.94	42.57	62.37
GM-79S (N-10628)	100.88	40.65	58.67
Intermediate Wells			
N-10624*	93.61	--	--
GM-15I	109.13	45.82	63.31
GM-16I	115.81	49.66	66.15
GM-17I	115.83	45.51	70.32
GM-18I	109.03	43.95	65.08
GM-19I	109.86	44.04	63.96
GM-20I	103.88	37.52	66.36
GM-21I	105.72	37.89	67.83
GM-74I	107.42	38.05	69.37
GM-78I	105.06	42.81	62.25
GM-79I	101.09	41.36	59.73

See notes on last page

Table 5. Water-Level Measurement Data, Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

Well Designation	Measuring Point Elevation (ft msl)	Depth to Water May 24, 2001 (ft bmp)	Water-Level Elevation May 24, 2001 (ft msl)
Deep Wells			
N-10627	93.70	33.85	59.85
GM-13D	113.97	48.48	65.49
GM-15D	109.66	48.71	60.95
GM-17D	115.68	50.89	64.79
GM-18D	108.88	46.90	61.98
GM-20D	103.92	39.61	64.31
GM-34D	71.19	15.78	55.41
GM-36D	91.63	36.51	55.12
GM-37D	97.26	40.50	56.76
GM-38D	91.75	39.49	52.26
GM-74D	107.43	46.45	60.98
GM-79D	101.25	42.92	58.33
Deep2 Wells			
GM-15D2	109.59	52.14	57.45
GM-33D2	106.85	51.20	55.65
GM-34D2	71.19	17.36	53.83
GM-35D2	96.28	41.31	54.97
GM-36D2	91.60	39.15	52.45
GM-37D2	97.17	41.21	55.96
GM-38D2	91.56	41.83	49.73
GM-70D2	99.58	42.55	57.03
GM-71D2	98.45	43.24	55.21
GM-73D2	104.62	47.79	56.83
GM-74D2	107.36	55.45	51.91
GM-75D2	93.63	36.80	56.83
OU2 Extraction Wells			
GP-1**	116.78	96.00	20.78
ONCT-1	104.10	66.33	37.77
ONCT-2	110.00	77.05	32.95
ONCT-3	108.70	75.54	33.16

* Water-level measurements collected from Well N-10624 are considered anomalous due to silt in the well screen.

** Water-levels measured by inflating airline set at 120 ft bmp (depth reading at gauge at wellhead).

ft msl feet relative to mean sea level

ft bmp below measuring point

OU2 Operable Unit 2

Table 6. Comparison of Vertical Hydraulic Gradients from the Second Quarter 2001 Groundwater Monitoring Round to Model-Predicted Gradients, Northrop Grumman Corporation, Bethpage, New York.

Well Pairing ID	Measuring Point Elevation (ft msl)	Well Screen Midpoint Elevation (ft msl)	24-May-01 Water-Level Elevation (ft msl)	24-May-01 Vertical Gradient (ft/ft) * 10^{-3}	Model-Predicted, IRM Steady-State Vertical Gradient (ft/ft) * 10^{-3}	Increase Compared to Model-Predicted, Steady-State Vertical Gradient
Shallow-Intermediate Wells						
GM-15S	109.35	34.53	63.33			
GM-15I	109.13	9.29	63.31	0.79	4.20	-3.40
GM-16SR	115.77	66.77	66.23			
GM-16I	115.81	-24.19	66.15	0.88	1.11	-0.23
GM-17SR	115.79	50.79	70.47			
GM-17I	115.83	5.83	70.32	3.34	8.02	-4.69
GM-18S	107.60	42.60	64.83			
GM-18I	109.03	9.03	65.08	-7.45	1.78	-9.23
GM-19S	109.86	64.36	66.39			
GM-19I	109.86	-25.14	65.82	6.37	2.44	3.92
GM-21S	105.81	40.81	72.00			
GM-21I	105.72	-29.28	67.83	59.49	18.44	41.05
GM-78S	104.94	39.94	62.37			
GM-78I	105.06	5.56	62.25	3.49	8.73	-5.24
GM-79S	100.88	35.88	58.67			
GM-79I	101.09	-73.91	59.73	-9.65	0.91	-10.57
Intermediate-Deep Wells						
GM-15I	109.29	9.29	63.31			
GM-15D	109.66	-227.34	60.95	9.97	6.52	3.45
GM-17I	115.83	5.83	70.32			
GM-17D	115.68	-172.32	64.79	31.04	7.86	23.18
GM-20I	103.88	3.88	66.36			
GM-20D	103.92	-117.08	64.31	16.95	18.22	-1.27
GM-74I	107.42	8.42	69.37			
GM-74D	107.43	-192.57	60.98	41.74	20.17	21.57
GM-79I	101.09	-73.91	59.73			
GM-79D	101.25	-183.75	58.33	12.75	15.48	-2.73
Deep-Deep 2 Wells						
GM-15D	109.66	-227.34	60.95			
GM-15D2	109.59	-436.41	57.45	16.74	14.19	2.56
GM-34D	71.19	-242.81	55.41			
GM-34D2	71.19	-443.81	53.83	7.86	2.33	5.53
GM-36D	91.63	-117.37	55.12			
GM-36D2	91.60	-443.40	52.45	8.19	2.75	5.44
GM-37D	97.26	-154.74	56.76			
GM-37D2	97.17	-282.83	55.96	6.25	3.88	2.37
GM-38D	91.75	-238.25	52.26			
GM-38D2	91.56	-393.44	49.73	16.30	6.08	10.22
GM-74D	107.43	-192.57	60.98			
GM-74D2	107.36	-444.64	51.91	35.98	28.26	7.72

Vertical hydraulic gradients are calculated as follows:

$$\frac{(\text{Water-Level Elevation}_1 - \text{Water-Level Elevation}_2)}{(\text{Screen Midpoint Elevation}_1 - \text{Screen Midpoint Elevation}_2)}$$

A positive "+" gradient value indicates a downward hydraulic gradient.
A negative "-" gradient value indicates an upward hydraulic gradient.

ft msl feet relative to mean sea level
ft feet

ARCADIS

Table 7. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL:	10631		10631		10634		10634	
		SAMPLE ID:	MW-10631		N-10631		10634		N-10634	
		DATE:	1/26/2001		5/8/2001		1/23/2001		5/7/2001	
Chloromethane	5		< 10		< 10		< 10		< 10	J
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2		< 0.2	J
Chloroethane	5		< 10		< 10		< 10		< 10	J
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10		< 10		< 10	
Carbon disulfide	50		< 10		< 10		R		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (tota	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		< 10	
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	J
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		**0.4**	**J**	< 10		< 10	
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloroprope	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethai	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			0		**0.4**		0		0	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 7. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	FW-03 FW-03 2/1/2001		FW-03 FW-03 5/31/2001		GM-14 GM-14 1/26/2001		GM-14 GM-14 5/7/2001	
Chloromethane	5		< 10		< 10	J	< 0.7		< 0.7	
Bromomethane	5		< 10		< 10		< 0.7		< 0.7	
Vinyl Chloride	2		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10		< 10		< 0.4		< 0.4	
Methylene chloride	5		< 10		< 10		< 1.1		< 1.2	
Acetone	50		< 10		< 10	J	< 2.7		< 2.7	
Carbon disulfide	50		< 10		< 10		< 0.3		< 0.3	
1,1-Dichloroethene	5		< 10		< 10		< 0.3		< 0.3	
1,1-Dichloroethane	5		< 10		< 10		< 0.6		< 0.6	
1,2-Dichloroethene (tota	5		< 10		**0.6**	**J**	< 0.6		< 0.6	
Chloroform	7		< 10		**0.5**	**J**	< 0.4		< 0.4	
1,2-Dichloroethane	5		< 10		< 10		< 0.3		< 0.3	
2-Butanone	50		< 10		< 10	J	< 1.1		< 1.1	
1,1,1-Trichloroethane	5		**3**	**J**	**2**	**J**	< 0.4		< 0.4	
Carbon tetrachloride	5		< 10		< 10		< 0.4		< 0.4	
Bromodichloromethane	50		< 10		< 10		< 0.4		< 0.4	
1,2-Dichloropropane	5		< 10		< 10		< 0.6		< 0.6	
cis-1,3-Dichloropropene	5		< 10		< 10		< 0.4		< 0.4	
Trichloroethene	5		**14**		**28**		< 0.3		< 0.3	
Dibromochloromethane	5		< 10		< 10		< 0.5		< 0.5	
1,1,2-Trichloroethane	5		< 10		< 10		< 0.4		< 0.4	
Benzene	0.7		< 10		< 10		< 0.4		< 0.4	
trans-1,3-Dichloroprope	5		< 10		< 10		< 0.4		< 0.4	
Bromoform	50		< 10		< 10		< 0.8		< 0.8	
4-Methyl-2-pentanone	50		< 10		< 10		< 1.1		< 1.1	
2-Hexanone	50		< 10		< 10		< 1.3		< 1.3	
Tetrachloroethene	5		**12**		**22**		< 0.7		< 0.7	
1,1,2,2-Tetrachloroethar	5		< 10		< 10		< 0.7		< 0.7	
Toluene	5		< 10		< 10		< 0.5		< 0.5	
Chlorobenzene	5		< 10		< 10		< 0.4		< 0.4	
Ethylbenzene	5		< 10		< 10		< 0.4		< 0.4	
Styrene	5		< 10		< 10		< 0.5		< 0.5	
Xylene (total)	5		< 10		< 10		< 1.4		< 1.4	
Total VOCs			**29**		**53.1**		0		0	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.

Table 7. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-15S GM-15S 1/30/2001	GM-15S 15S 5/2/2001	GM-16SR GM-16SR 2/2/2001	GM-16SR GM-16SR 5/8/2001
Chloromethane	5		< 10	< 10 J	< 10 J	< 10
Bromomethane	5		< 10	< 10	< 10	< 10
Vinyl Chorìde	2		< 0.2	< 0.2	< 0.2 J	< 0.2
Chloroethane	5		< 10	< 10 J	< 10 J	< 10
Methylene chloride	5		< 10	< 10	< 10	< 10
Acetone	50		< 10	< 10	< 10 J	< 10
Carbon disulfide	50		< 10	< 10	< 10	< 10
1,1-Dichloroethene	5		< 10	< 10	< 10	< 10
1,1-Dichloroethane	5		< 10	< 10	< 10	< 10
1,2-Dichloroethene (tota	5		< 10	**2** J	< 10	< 10
Chloroform	7		< 10	< 10	< 10	< 10
1,2-Dichloroethane	5		< 10	< 10	< 10	< 10
2-Butanone	50		< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	5		< 10	< 10	< 10	< 10
Carbon tetrachloride	5		< 10	< 10	< 10	< 10
Bromodichloromethane	50		< 10	< 10	< 10	< 10
1,2-Dichloropropane	5		< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene	5		< 10	< 10	< 10	< 10
Trichloroethene	5		**6** J	**13**	< 10	< 10
Dibromochloromethane	5		< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	5		< 10	< 10	< 10	< 10
Benzene	0.7		< 10	< 10	< 10	< 10
trans-1,3-Dichloroprope	5		< 10	< 10	< 10	< 10
Bromoform	50		< 10	< 10	< 10	< 10
4-Methyl-2-pentanone	50		< 10	< 10	< 10	< 10
2-Hexanone	50		< 10	< 10	< 10	< 10
Tetrachloroethene	5		< 10	< 10	< 10	< 10
1,1,2,2-Tetrachloroethai	5		< 10	< 10	< 10	< 10
Toluene	5		< 10	< 10	< 10	< 10
Chlorobenzene	5		< 10	< 10	< 10	< 10
Ethylbenzene	5		< 10	< 10	< 10	< 10
Styrene	5		< 10	< 10	< 10	< 10
Xylene (total)	5		< 10	< 10	< 10	< 10
Total VOCs			**6**	**15**	0	0

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 7. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-17SR GM-17SR 1/31/2001		GM-17SR 17SR 5/2/2001		GM-18S GM-18S 1/23/2001		GM-18S 18S 5/30/2001	
Chloromethane	5		< 10		< 10	J	< 10		< 10	J
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10		< 10	J	< 10		< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10		< 10		< 10	
Carbon disulfide	50		< 10		< 10		R		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (tota	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		< 10	J
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		< 10		1	J	2	J
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloroprope	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethai	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			0		0		1		2	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 7. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-21S GM-21S 1/23/2001		GM-21S 21S 5/30/2001		GM-78S 78S 6/4/2001		HN-40S HN-40S 2/13/2001	
Chloromethane	5		< 10		< 10	J	< 10	J	< 10	
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10		< 10		< 10		< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10	J	< 10	J	< 10	J
Carbon disulfide	50		R		< 10		< 10		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (tota	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10	J	< 10	J	< 10	
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		< 10		1	J	< 10	
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloroprope	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		0.4	J	< 10	
1,1,2,2-Tetrachloroethai	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			0		0		1.4		0	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 7. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	HN-40S HN-40S 5/4/2001		HN-42S HN-42S 2/9/2001		HN-42S HN-42S 5/4/2001		MW-03R MW-3R 1/26/2001	
Chloromethane	5		< 10	J	< 10		< 10	J	< 10	
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2	J	< 0.2		< 0.2	J	< 0.2	
Chloroethane	5		< 10	J	< 10		< 10	J	< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10		< 10		< 10	
Carbon disulfide	50		< 10		< 10		< 10		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (tota	5		< 10		< 10		< 10		< 10	
Chloroform	7		**0.5**	**J**	< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		< 10	
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10	J	< 10		< 10	J	< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		< 10		< 10		**3**	**J**
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloroprope	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethai	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			**0.5**		0		0		**3**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 7. Concentrations of Volatile Organic Compounds Detected in Shallow Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	MW-03R MW-3R 5/8/2001		MW-03R REP-1 5/8/2001	
Chloromethane	5	<	10		< 10	
Bromomethane	5	<	10		< 10	
Vinyl Choride	2	<	0.2		< 0.2	
Chloroethane	5	<	10		< 10	
Methylene chloride	5	<	10		< 10	
Acetone	50	<	10		< 10	
Carbon disulfide	50	<	10		< 10	
1,1-Dichloroethene	5	<	10		< 10	
1,1-Dichloroethane	5	<	10		< 10	
1,2-Dichloroethene (tota	5		**1**	**J**	**1**	**J**
Chloroform	7	<	10		< 10	
1,2-Dichloroethane	5	<	10		< 10	
2-Butanone	50	<	10		< 10	
1,1,1-Trichloroethane	5	<	10		< 10	
Carbon tetrachloride	5	<	10		< 10	
Bromodichloromethane	50	<	10		< 10	
1,2-Dichloropropane	5	<	10		< 10	
cis-1,3-Dichloropropene	5	<	10		< 10	
Trichloroethene	5		**5**	**J**	**5**	**J**
Dibromochloromethane	5	<	10		< 10	
1,1,2-Trichloroethane	5	<	10		< 10	
Benzene	0.7	<	10		< 10	
trans-1,3-Dichloroprope	5	<	10		< 10	
Bromoform	50	<	10		< 10	
4-Methyl-2-pentanone	50	<	10		< 10	
2-Hexanone	50	<	10		< 10	
Tetrachloroethene	5		**0.4**	**J**	**0.4**	**J**
1,1,2,2-Tetrachloroethai	5	<	10		< 10	
Toluene	5	<	10		< 10	
Chlorobenzene	5	<	10		< 10	
Ethylbenzene	5	<	10		< 10	
Styrene	5	<	10		< 10	
Xylene (total)	5	<	10		< 10	
Total VOCs			**6.4**		**6.4**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 8. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-15I GM15I 1/24/2001		GM-15I 15I 5/1/2001		GM-16I GM-16I 2/2/2001		GM-16I 16I 5/1/2001	
Chloromethane	5		< 10		< 10	J	< 10	J	< 10	J
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2	J	< 0.2	
Chloroethane	5		< 10		< 10	J	< 10	J	< 10	J
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10		< 10	J	< 10	
Carbon disulfide	50		R		< 10		< 10		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		1	J
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)	5		< 10		**1**	J	**0.9**	J	**2**	J
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		< 10	
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		**4**	J	**25**		**21**	
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		**2**	J	**3**	J
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			0		**5**		**27.9**		**27**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on Field Logs and Historical Data, it appears that the bottleware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective Site IDs.

Table 8. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-17I GM-17I 1/31/2001		GM-17I 17I 5/2/2001		GM-18I GM-18I 2/2/2001		GM-18I 18I 6/4/2001	
Chloromethane	5		< 10		< 10	J	< 10	J	< 10	
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2	J	< 0.2	
Chloroethane	5		< 10		< 10	J	< 10	J	< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10		< 10	J	< 10	
Carbon disulfide	50		< 10		< 10		< 10		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		< 10	
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		< 10		< 10		0.4	J
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			0		0		0		0.4	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on Field Logs and Historical Data, it appears that the bottleware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective Site IDs.

Table 8. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-20I GM20I 1/24/2001		GM-20I+ REP3 6/5/2001		GM-21I GM-21I 1/23/2001		GM-21I 21I 5/30/2001	
Chloromethane	5		< 10		< 10	J	< 10		< 10	J
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10		< 10		< 10		< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10	J	< 10		< 10	J
Carbon disulfide	50		R		< 10		R		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10	J	< 10		< 10	J
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		1	J	< 10		< 10	
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			0		1		0		0	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on Field Logs and Historical Data, it appears that the bottleware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective Site IDs.

Table 8. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-74I GM-74I 2/5/2001		GM-74I 74I 6/5/2001		GM-78I 78I 6/4/2001		GM-79I GM-79I 2/14/2001	
Chloromethane	5		< 10	J	< 10	J	< 10	J	< 10	
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2	J	< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10	J	< 10		< 10		< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10	J	**3**	**J**	< 10	J	< 10	J
Carbon disulfide	50		< 10		< 10		< 10		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10	J	< 10	J	< 10	
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		< 10		**0.8**	**J**	**6**	**J**
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			**0**		**3**		**0.8**		**6**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on Field Logs and Historical Data, it appears that the bottleware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective Site IDs.

Table 8. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-79I 79I 5/7/2001		HN-24I HN-24I 2/1/2001		HN-24I HN-24I 5/31/2001		HN-29I HN-29I 2/1/2001	
Chloromethane	5		< 10	J	< 10		< 20	J	< 10	
Bromomethane	5		< 10		< 10		< 20		< 10	
Vinyl Choride	2		< 0.2	J	< 0.2		< 0.4		< 0.2	
Chloroethane	5		< 10	J	< 10		< 20		< 10	
Methylene chloride	5		< 10		< 10		< 20		< 10	
Acetone	50		< 10		< 10		< 20	J	< 10	
Carbon disulfide	50		< 10		< 10		< 20		< 10	
1,1-Dichloroethene	5		< 10		**14**		**11**	**J**	< 10	
1,1-Dichloroethane	5		**2**	**J**	**9**	**J**	7	**J**	**1**	**J**
1,2-Dichloroethene (total)	5		< 10		**14**		**11**	**J**	< 10	
Chloroform	7		< 10		< 10		**0.6**	**J**	< 10	
1,2-Dichloroethane	5		< 10		< 10		< 20		< 10	
2-Butanone	50		< 10		< 10		< 20	J	< 10	
1,1,1-Trichloroethane	5		< 10		**10**		**8**	**J**	< 10	
Carbon tetrachloride	5		< 10	J	< 10		< 20		< 10	
Bromodichloromethane	50		< 10		< 10		< 20		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 20		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 20		< 10	
Trichloroethene	5		**3**	**J**	**200**		**180**		**2**	**J**
Dibromochloromethane	5		< 10		< 10		< 20		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 20		< 10	
Benzene	0.7		< 10		< 10		< 20		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 20		< 10	
Bromoform	50		< 10		< 10		< 20		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 20		< 10	
2-Hexanone	50		< 10		< 10		< 20		< 10	
Tetrachloroethene	5		< 10		**10**		**8**	**J**	< 10	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 20		< 10	
Toluene	5		< 10		< 10		< 20		< 10	
Chlorobenzene	5		< 10		< 10		< 20		< 10	
Ethylbenzene	5		< 10		< 10		< 20		< 10	
Styrene	5		< 10		< 10		< 20		< 10	
Xylene (total)	5		< 10		< 10		< 20		< 10	
Total VOCs			**5**		**257**		**225.6**		**3**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on Field Logs and Historical Data, it appears that the bottleware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective Site IDs.

Table 8. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	HN-29I HN-29I 5/31/2001		HN-40I HN-40I 2/13/2001		HN-40I HN-40I 5/4/2001		HN-42I HN-42I 2/9/2001	
Chloromethane	5		< 10	J	< 10		< 10	J	< 10	
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2	J	< 0.2	
Chloroethane	5		< 10		< 10		< 10	J	< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	J
Acetone	50		< 10	J	< 10	J	< 10		< 10	
Carbon disulfide	50		< 10		< 10		< 10		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		**0.9**	**J**	< 10		< 10		< 10	
1,2-Dichloroethene (total)	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10	J	< 10		< 10		< 10	
1,1,1-Trichloroethane	5		**0.7**	**J**	< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10	J	< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		< 10		**2**	**J**	**4**	**J**	**1**	**J**
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		**0.9**	**J**	< 10		**0.6**	**J**	< 10	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		**0.7**	**J**	< 10		**0.8**	**J**
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			**2.5**		**2.7**		**4.6**		**1.8**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.
+ Based on Field Logs and Historical Data, it appears that the bottleware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective Site IDs.

Table 8. Concentrations of Volatile Organic Compounds Detected in Intermediate Wells, First and Second Quarters 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	HN-42I HN-42I 5/4/2001	
Chloromethane	5	<	10	J
Bromomethane	5	<	10	
Vinyl Choride	2	<	0.2	J
Chloroethane	5	<	10	J
Methylene chloride	5	<	10	
Acetone	50	<	10	
Carbon disulfide	50	<	10	
1,1-Dichloroethene	5	<	10	
1,1-Dichloroethane	5	<	10	
1,2-Dichloroethene (total)	5	<	10	
Chloroform	7	<	10	
1,2-Dichloroethane	5	<	10	
2-Butanone	50	<	10	
1,1,1-Trichloroethane	5	<	10	
Carbon tetrachloride	5	<	10	J
Bromodichloromethane	50	<	10	
1,2-Dichloropropane	5	<	10	
cis-1,3-Dichloropropene	5	<	10	
Trichloroethene	5		**0.9**	**J**
Dibromochloromethane	5	<	10	
1,1,2-Trichloroethane	5	<	10	
Benzene	0.7	<	10	
trans-1,3-Dichloropropene	5	<	10	
Bromoform	50	<	10	
4-Methyl-2-pentanone	50	<	10	
2-Hexanone	50	<	10	
Tetrachloroethene	5	<	10	
1,1,2,2-Tetrachloroethane	5	<	10	
Toluene	5	<	10	
Chlorobenzene	5	<	10	
Ethylbenzene	5	<	10	
Styrene	5	<	10	
Xylene (total)	5	<	10	
Total VOCs			**0.9**	

VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
J	Estimated value.
R	Non-detect unusable data based on calibration results.
NYSDEC	New York State Department of Environmental Conservation.
(1)	Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
	Value exceeds associated Standard Criteria and Guidance value.
+	Based on Field Logs and Historical Data, it appears that the bottleware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective Site IDs.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	10627 N-10627 2/13/2001		10627 N-10627 6/6/2001		GM-13D GM-13D 2/15/2001		GM-13D 13D 6/6/2001	
Chloromethane	5		< 10		< 10		< 50		< 50	
Bromomethane	5		< 10		< 10		< 50		< 50	
Vinyl Choride	2		< 0.2		< 0.2		< 1		< 1	
Chloroethane	5		< 10		< 10		< 50		< 50	
Methylene chloride	5		< 10		< 10		< 50		< 50	
Acetone	50		< 10	J	**3**	**J**	< 50	J	< 50	J
Carbon disulfide	50		< 10		< 10		< 50		< 50	
1,1-Dichloroethene	5		< 10		< 10		**82**		**83**	
1,1-Dichloroethane	5		< 10		< 10		**58**		**64**	
1,2-Dichloroethene (total)	5		< 10		< 10		**190**		**200**	
Chloroform	7		< 10		< 10		< 50		< 50	
1,2-Dichloroethane	5		< 10		< 10		< 50		< 50	
2-Butanone	50		< 10		< 10	J	< 50		< 50	
1,1,1-Trichloroethane	5		< 10		< 10		**96**		**100**	
Carbon tetrachloride	5		< 10		< 10		< 50		< 50	
Bromodichloromethane	50		< 10		< 10		< 50		< 50	
1,2-Dichloropropane	5		< 10		< 10		< 50		< 50	
cis-1,3-Dichloropropene	5		< 10		< 10		< 50		< 50	
Trichloroethene	5		**2**	**J**	7	**J**	**280**		**330**	
Dibromochloromethane	5		< 10		< 10		< 50		< 50	
1,1,2-Trichloroethane	5		< 10		< 10		< 50		< 50	
Benzene	0.7		< 10		< 10		< 50		< 50	
trans-1,3-Dichloropropene	5		< 10		< 10		< 50		< 50	
Bromoform	50		< 10		< 10		< 50		< 50	
4-Methyl-2-pentanone	50		< 10		< 10		< 50		< 50	
2-Hexanone	50		< 10		< 10	J	< 50		< 50	J
Tetrachloroethene	5		< 10		< 10		**720**		**650**	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 50		< 50	
Toluene	5		< 10		< 10		< 50		< 50	
Chlorobenzene	5		< 10		< 10		< 50		< 50	
Ethylbenzene	5		< 10		< 10		< 50		< 50	
Styrene	5		< 10		< 10		< 50		< 50	
Xylene (total)	5		< 10		< 10		< 50		< 50	
Total VOCs			**2**		**10**		**1,426**		**1,427**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-15D GM-15D 1/30/2001		GM-15D 15D 4/30/2001		GM-17D GM-17D 1/31/2001		GM-17D 17D 5/1/2001	
Chloromethane	5		< 10		< 10	J	< 10		< 10	J
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10		< 10	J	< 10		< 10	J
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10		< 10		< 10		< 10	
Carbon disulfide	50		< 10		< 10		< 10		< 10	
1,1-Dichloroethene	5		**2**	**J**	**4**	**J**	< 10		< 10	
1,1-Dichloroethane	5		**6**	**J**	**7**	**J**	< 10		< 10	
1,2-Dichloroethene (total)	5		**2**	**J**	**2**	**J**	< 10		< 10	
Chloroform	7		< 10		**0.7**	**J**	< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		**3**	**J**
1,1,1-Trichloroethane	5		**2**	**J**	**3**	**J**	< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		**13**		**12**		< 10		< 10	
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	
Tetrachloroethene	5		**6**	**J**	**5**	**J**	< 10		< 10	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			**31**		**33.7**		0		**3**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-18D GM-18D 2/14/2001		GM-18D 18D 6/4/2001		GM-20D GM20D 1/24/2001		GM-20D 20D 6/6/2001	
Chloromethane	5		< 10		< 10		< 10		< 10	
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10		< 10		< 10		< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10	J	< 10		< 10		< 10	
Carbon disulfide	50		< 10		< 10		R		< 10	
1,1-Dichloroethene	5		< 10		< 10		< 10		< 10	
1,1-Dichloroethane	5		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)	5		< 10		< 10		< 10		< 10	
Chloroform	7		< 10		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		< 10	J
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		**0.7**	**J**	**2**	**J**	< 10		< 10	
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	J
Tetrachloroethene	5		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10		< 10	
Total VOCs			**0.7**		**2**		0		0	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-34D GM-34D 2/8/2001		GM-34D 34D 5/3/2001		GM-36D GM-36D 2/7/2001		GM-36D 36D 6/7/2001	
Chloromethane	5		< 10		< 10	J	< 10		< 10	
Bromomethane	5		< 10		< 10		< 10		< 10	
Vinyl Chloride	2		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10		< 10	J	< 10		< 10	
Methylene chloride	5		< 10		< 10		< 10		< 10	
Acetone	50		< 10	J	< 10		< 10	J	< 10	
Carbon disulfide	50		< 10		< 10		< 10		< 10	
1,1-Dichloroethene	5		**4**	**J**	**5**	**J**	< 10		< 10	
1,1-Dichloroethane	5		**4**	**J**	**4**	**J**	< 10		< 10	
1,2-Dichloroethene (total)	5		**4**	**J**	**4**	**J**	< 10		< 10	
Chloroform	7		**0.6**	**J**	**0.7**	**J**	< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10		< 10	J
1,1,1-Trichloroethane	5		< 10		< 10		< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Trichloroethene	5		**96**		**110**		**30**		**22**	
Dibromochloromethane	5		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10		< 10	J
Tetrachloroethene	5		**4**	**J**	**4**	**J**	**1**	**J**	**1**	**J**
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10		< 10	
Xylene (total)	5		**1**	**J**	**0.8**	**J**	< 10		< 10	
Total VOCs			**113.6**		**128.5**		**31**		**23**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
Value exceeds associated Standard Criteria and Guidance value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-37D GM-37D 2/6/2001		GM-37D 37D 6/1/2001		GM-38D GM-38D 1/25/2001		GM-38D 38D 5/11/2001	
Chloromethane	5		< 10		< 10	J	< 50		< 50	
Bromomethane	5		< 10		< 10		< 50		< 50	
Vinyl Choride	2		< 0.2		< 0.2		< 1		< 1	
Chloroethane	5		< 10		< 10		< 50		< 50	J
Methylene chloride	5		< 10		< 10		< 50		< 50	
Acetone	50		**4**	J	< 10	J	< 50		< 50	
Carbon disulfide	50		< 10		< 10		R		< 50	
1,1-Dichloroethene	5		**3**	J	**3**	J	< 50		**6**	J
1,1-Dichloroethane	5		**8**	J	**7**	J	< 50		< 50	
1,2-Dichloroethene (total)	5		< 10		< 10		< 50		**3**	J
Chloroform	7		**1**	J	**1**	J	< 50		**1**	J
1,2-Dichloroethane	5		< 10		< 10		< 50		< 50	
2-Butanone	50		< 10		< 10	J	< 50		< 50	
1,1,1-Trichloroethane	5		**4**	J	**4**	J	< 50		**4**	J
Carbon tetrachloride	5		< 10		< 10		< 50		< 50	
Bromodichloromethane	50		< 10		< 10		< 50		< 50	
1,2-Dichloropropane	5		< 10		< 10		< 50		< 50	
cis-1,3-Dichloropropene	5		< 10		< 10		< 50		< 50	
Trichloroethene	5		**0.5**	J	**0.8**	J	**590**		**660**	
Dibromochloromethane	5		< 10		< 10		< 50		< 50	
1,1,2-Trichloroethane	5		< 10		< 10		< 50		< 50	
Benzene	0.7		< 10		< 10		< 50		< 50	
trans-1,3-Dichloropropene	5		< 10		< 10		< 50		< 50	
Bromoform	50		< 10		< 10		< 50		< 50	
4-Methyl-2-pentanone	50		< 10		< 10		< 50		< 50	
2-Hexanone	50		< 10		< 10		< 50		< 50	
Tetrachloroethene	5		**1**	J	**2**	J	< 50		**1**	J
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 50		< 50	
Toluene	5		< 10		< 10		< 50		< 50	
Chlorobenzene	5		< 10		< 10		< 50		< 50	
Ethylbenzene	5		< 10		< 10		< 50		< 50	
Styrene	5		< 10		< 10		< 50		< 50	
Xylene (total)	5		< 10		**0.5**	J	< 50		< 50	
Total VOCs			**21.5**		**18.3**		**590**		**675**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL:	GM-38D*		GM-74D		GM-74D		GM-79D	
		SAMPLE ID:	REP051101		GM-74D		74D		GM-79D	
		DATE:	5/11/2001		2/5/2001		6/5/2001		2/14/2001	
Chloromethane	5		< 50		< 10	J	< 10	J	< 10	
Bromomethane	5		< 50		< 10		< 10		< 10	
Vinyl Choride	2		< 1		< 0.2	J	< 0.2		< 0.2	
Chloroethane	5		< 50	J	< 10	J	< 10		< 10	
Methylene chloride	5		< 50		< 10		< 10		< 10	
Acetone	50		< 50		< 10	J	**7**	J	< 10	J
Carbon disulfide	50		< 50		< 10		< 10		< 10	
1,1-Dichloroethene	5		**5**	J	< 10		**0.8**	J	**1**	J
1,1-Dichloroethane	5		< 50		< 10		< 10		**0.9**	J
1,2-Dichloroethene (total)	5		**2**	J	**1**	J	**1**	J	**0.9**	J
Chloroform	7		**0.9**	J	< 10		< 10		< 10	
1,2-Dichloroethane	5		< 50		< 10		< 10		< 10	
2-Butanone	50		< 50		< 10		< 10	J	< 10	
1,1,1-Trichloroethane	5		**3**	J	< 10		< 10		**1**	J
Carbon tetrachloride	5		< 50		< 10		< 10		< 10	
Bromodichloromethane	50		< 50		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 50		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 50		< 10		< 10		< 10	
Trichloroethene	5		**610**		**81**		**63**		**48**	
Dibromochloromethane	5		< 50		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 50		< 10		< 10		< 10	
Benzene	0.7		< 50		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 50		< 10		< 10		< 10	
Bromoform	50		< 50		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 50		< 10		< 10		< 10	
2-Hexanone	50		< 50		< 10		< 10		< 10	
Tetrachloroethene	5		< 50		**3**	J	**4**	J	< 10	
1,1,2,2-Tetrachloroethane	5		< 50		< 10		< 10		< 10	
Toluene	5		< 50		< 10		< 10		< 10	
Chlorobenzene	5		< 50		< 10		< 10		< 10	
Ethylbenzene	5		< 50		< 10		< 10		< 10	
Styrene	5		< 50		< 10		< 10		< 10	
Xylene (total)	5		< 50		< 10		< 10		< 10	
Total VOCs			**620.9**		**85**		**75.8**		**51.8**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.

Table 9. Concentrations of Volatile Organic Compounds Detected in Deep Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-79D 79D 5/3/2001		HN-29D HN-29D 2/1/2001		HN-29D HN-29D 5/31/2001	
Chloromethane	5		< 10	J	< 10		< 10	J
Bromomethane	5		< 10		< 10		< 10	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2	
Chloroethane	5		< 10	J	< 10		< 10	
Methylene chloride	5		< 10		< 10		< 10	
Acetone	50		< 10		< 10		< 10	J
Carbon disulfide	50		< 10		< 10		< 10	
1,1-Dichloroethene	5		**1**	**J**	< 10		< 10	
1,1-Dichloroethane	5		**0.9**	**J**	< 10		< 10	
1,2-Dichloroethene (total)	5		**1**	**J**	< 10		< 10	
Chloroform	7		< 10		< 10		< 10	
1,2-Dichloroethane	5		< 10		< 10		< 10	
2-Butanone	50		< 10		< 10		< 10	J
1,1,1-Trichloroethane	5		**1**	**J**	< 10		< 10	
Carbon tetrachloride	5		< 10		< 10		< 10	
Bromodichloromethane	50		< 10		< 10		< 10	
1,2-Dichloropropane	5		< 10		< 10		< 10	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10	
Trichloroethene	5		**49**		< 10		< 10	
Dibromochloromethane	5		< 10		< 10		< 10	
1,1,2-Trichloroethane	5		< 10		< 10		< 10	
Benzene	0.7		< 10		< 10		< 10	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10	
Bromoform	50		< 10		< 10		< 10	
4-Methyl-2-pentanone	50		< 10		< 10		< 10	
2-Hexanone	50		< 10		< 10		< 10	
Tetrachloroethene	5		**0.4**	**J**	< 10		**0.2**	**J**
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10	
Toluene	5		< 10		< 10		< 10	
Chlorobenzene	5		< 10		< 10		< 10	
Ethylbenzene	5		< 10		< 10		< 10	
Styrene	5		< 10		< 10		< 10	
Xylene (total)	5		< 10		< 10		< 10	
Total VOCs			**53.3**		0		**0.2**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.

Table 10. Concentrations of Volatile Organic Compounds Detected in D2 Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-15D2 GM-15D2 1/30/2001	GM-15D2 15D2 4/30/2001	GM-33D2 GM-33D-2 2/15/2001	GM-33D2 33D2 6/6/2001
Chloromethane	5		< 10	< 10 J	< 100	< 50
Bromomethane	5		< 10	< 10	< 100	< 50
Vinyl Choride	2		< 0.2	< 0.2	< 2	< 1
Chloroethane	5		< 10	< 10 J	< 100	< 50
Methylene chloride	5		< 10	< 10	< 100	< 50
Acetone	50		< 10	< 10	< 100 J	**36 J**
Carbon disulfide	50		< 10	< 10	< 100	< 50
1,1-Dichloroethene	5		< 10	**1 J**	< 100	< 50
1,1-Dichloroethane	5		< 10	< 10	< 100	< 50
1,2-Dichloroethene (total)	5		< 10	**0.8 J**	< 100	< 50
Chloroform	7		< 10	< 10	< 100	< 50
1,2-Dichloroethane	5		< 10	< 10	< 100	< 50
2-Butanone	50		< 10	< 10	< 100	< 50 J
1,1,1-Trichloroethane	5		< 10	< 10	< 100	< 50
Carbon tetrachloride	5		< 10	< 10	< 100	< 50
Bromodichloromethane	50		< 10	< 10	< 100	< 50
1,2-Dichloropropane	5		< 10	< 10	< 100	< 50
cis-1,3-Dichloropropene	5		< 10	< 10	< 100	< 50
Trichloroethene	5		**15**	**13**	**950**	**500**
Dibromochloromethane	5		< 10	< 10	< 100	< 50
1,1,2-Trichloroethane	5		< 10	< 10	< 100	< 50
Benzene	0.7		< 10	< 10	< 100	< 50
trans-1,3-Dichloropropene	5		< 10	< 10	< 100	< 50
Bromoform	50		< 10	< 10	< 100	< 50
4-Methyl-2-pentanone	50		< 10	< 10	< 100	< 50
2-Hexanone	50		< 10	< 10	< 100	< 50 J
Tetrachloroethene	5		**9 J**	**7 J**	**16 J**	**12 J**
1,1,2,2-Tetrachloroethane	5		< 10	< 10	< 100	< 50
Toluene	5		< 10	< 10	< 100	< 50
Chlorobenzene	5		< 10	< 10	< 100	< 50
Ethylbenzene	5		< 10	< 10	< 100	< 50
Styrene	5		< 10	< 10	< 100	< 50
Xylene (total)	5		< 10	< 10	< 100	< 50
Total VOCs			**24**	**21.8**	**966**	**548**

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on field logs and historical data, it appears that the bottle ware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective site IDs.

Table 10. Concentrations of Volatile Organic Compounds Detected in D2 Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	GM-34D2 GM-34D-2 2/8/2001		GM-34D2 34D2 5/3/2001		GM-35D2 GM-35D-2 2/19/2001		GM-35D2 35D2 6/7/2001	
Chloromethane	5		< 10		< 10	J	< 10		< 20	
Bromomethane	5		< 10		< 10		< 10		< 20	
Vinyl Choride	2		< 0.2		< 0.2		< 0.2		< 0.4	
Chloroethane	5		< 10		< 10	J	< 10		< 20	
Methylene chloride	5		< 10		< 10		< 10		< 20	
Acetone	50		< 10		< 10		< 10	J	< 20	
Carbon disulfide	50		< 10		< 10		< 10		< 20	
1,1-Dichloroethene	5		**5**	J	**8**	J	**3**	J	< 20	
1,1-Dichloroethane	5		< 10		**1**	J	**0.7**	J	< 20	
1,2-Dichloroethene (total)	5		**2**	J	**1**	J	**2**	J	**4**	J
Chloroform	7		< 10		< 10		**0.7**	J	< 20	
1,2-Dichloroethane	5		< 10		< 10		< 10		< 20	
2-Butanone	50		< 10		< 10		< 10		< 20	
1,1,1-Trichloroethane	5		**1**	J	**1**	J	**2**	J	< 20	
Carbon tetrachloride	5		< 10		< 10		**2**	J	< 20	
Bromodichloromethane	50		< 10		< 10		< 10		< 20	
1,2-Dichloropropane	5		< 10		< 10		< 10		< 20	
cis-1,3-Dichloropropene	5		< 10		< 10		< 10		< 20	
Trichloroethene	5		**63**		**100**		**130**		**200**	
Dibromochloromethane	5		< 10		< 10		< 10		< 20	
1,1,2-Trichloroethane	5		< 10		< 10		< 10		< 20	
Benzene	0.7		< 10		< 10		< 10		< 20	
trans-1,3-Dichloropropene	5		< 10		< 10		< 10		< 20	
Bromoform	50		< 10		< 10		< 10		< 20	
4-Methyl-2-pentanone	50		< 10		< 10		< 10		< 20	
2-Hexanone	50		< 10		< 10		< 10		< 20	
Tetrachloroethene	5		**8**	J	**8**	J	**2**	J	**2**	J
1,1,2,2-Tetrachloroethane	5		< 10		< 10		< 10		< 20	
Toluene	5		< 10		< 10		< 10		< 20	
Chlorobenzene	5		< 10		< 10		< 10		< 20	
Ethylbenzene	5		< 10		< 10		< 10		< 20	
Styrene	5		< 10		< 10		< 10		< 20	
Xylene (total)	5		< 10		**0.5**	J	< 10		< 20	
Total VOCs			**79**		**119.5**		**142.4**		**206**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on field logs and historical data, it appears that the bottle ware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective site IDs.

Table 10. Concentrations of Volatile Organic Compounds Detected in D2 Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	ONCT-3 ONCT-3 6/21/2001		ONCT INFLUENT ONCT INFLUENT 2/20/2001		ONCT INFLUENT* REP-1 (ONCT) 2/20/2001		ONCT INFLUENT ONCT INF 6/21/2001	
Chloromethane	5		< 10		R		R		< 200	
Bromomethane	5		< 10		< 50	J	< 50	J	< 200	
Vinyl Choride	2		< 0.2		R		R		< 4	
Chloroethane	5		< 10		R		R		< 200	
Methylene chloride	5		< 10		< 50		< 50		< 210	
Acetone	50		< 10		< 50		< 50		1400	J
Carbon disulfide	50		< 10		< 50		< 50		< 200	
1,1-Dichloroethene	5		0.6	J	< 50		< 50		17	J
1,1-Dichloroethane	5		< 10	J	< 50		< 50		< 200	
1,2-Dichloroethene (total)	5		1	J	< 50		< 50		39	J
Chloroform	7		1	J	< 50		< 50		< 200	
1,2-Dichloroethane	5		< 10		< 50		< 50		< 200	
2-Butanone	50		< 10		< 50		< 50		< 200	J
1,1,1-Trichloroethane	5		< 10		< 50		< 50		< 200	
Carbon tetrachloride	5		< 10		< 50		< 50		< 200	
Bromodichloromethane	50		< 10		< 50		< 50		< 200	
1,2-Dichloropropane	5		< 10		< 50		< 50		< 200	
cis-1,3-Dichloropropene	5		< 10		< 50		< 50		< 200	
Trichloroethene	5		20		610		600		2300	
Dibromochloromethane	5		< 10		< 50		< 50		< 200	
1,1,2-Trichloroethane	5		< 10		< 50		< 50		< 200	
Benzene	0.7		< 10		< 50		< 50		< 200	
trans-1,3-Dichloropropene	5		< 10		< 50		< 50		< 200	
Bromoform	50		< 10		< 50		< 50		< 200	
4-Methyl-2-pentanone	50		< 10		< 50		< 50		< 200	J
2-Hexanone	50		< 10		< 50		< 50		< 200	J
Tetrachloroethene	5		12		< 50		< 50		15	J
1,1,2,2-Tetrachloroethane	5		< 10		< 50		< 50		< 200	
Toluene	5		< 10		< 50		< 50		< 200	
Chlorobenzene	5		< 10		< 50		< 50		< 200	
Ethylbenzene	5		< 10		< 50		< 50		< 200	
Styrene	5		< 10		< 50		< 50		< 200	
Xylene (total)	5		< 10		< 50		< 50		< 200	
Total VOCs			34.6		610		600		3771	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 2000).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on field logs and historical data, it appears that the bottle ware for REP3 and GM-20I were switched; the corrected IDs are shown on their respective site IDs.

Table 10. Concentrations of Volatile Organic Compounds Detected in D2 Wells, First and Second Quarter 2001, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC Standards Criteria and Guidance Values[1]	WELL: SAMPLE ID: DATE:	ONCT INFLUENT ONCTREP-1 6/21/2001		ONCT EFFLUENT ONCT EFFLUENT 2/20/2001		ONCT EFFLUENT ONCT EFF 6/21/2001	
Chloromethane	5		< 200		R		< 10	
Bromomethane	5		< 200		< 10	J	< 10	
Vinyl Choride	2		< 4		R		< 0.2	
Chloroethane	5		< 200		R		< 10	
Methylene chloride	5		< 200		< 10		< 10	
Acetone	50		**1600**	J	< 10		< 10	
Carbon disulfide	50		< 200		< 10		< 10	
1,1-Dichloroethene	5		**13**	J	< 10		< 10	
1,1-Dichloroethane	5		< 200		< 10		< 10	
1,2-Dichloroethene (total)	5		**41**	J	< 10		< 10	
Chloroform	7		< 200		< 10		< 10	
1,2-Dichloroethane	5		< 200		< 10		< 10	
2-Butanone	50		< 200	J	< 10		< 10	
1,1,1-Trichloroethane	5		< 200		< 10		< 10	
Carbon tetrachloride	5		< 200		< 10		< 10	
Bromodichloromethane	50		< 200		< 10		< 10	
1,2-Dichloropropane	5		< 200		< 10		< 10	
cis-1,3-Dichloropropene	5		< 200		< 10		< 10	
Trichloroethene	5		**2400**		< 10		< 10	
Dibromochloromethane	5		< 200		< 10		< 10	
1,1,2-Trichloroethane	5		< 200		< 10		< 10	
Benzene	0.7		< 200		< 10		< 10	
trans-1,3-Dichloropropene	5		< 200		< 10		< 10	
Bromoform	50		< 200		< 10		< 10	
4-Methyl-2-pentanone	50		< 200	J	< 10		< 10	
2-Hexanone	50		< 200	J	< 10		< 10	
Tetrachloroethene	5		**13**	J	< 10		< 10	
1,1,2,2-Tetrachloroethane	5		< 200		< 10		< 10	
Toluene	5		< 200		< 10		< 10	
Chlorobenzene	5		< 200		< 10		< 10	
Ethylbenzene	5		< 200		< 10		< 10	
Styrene	5		< 200		< 10		< 10	
Xylene (total)	5		< 200		< 10		< 10	
Total VOCs			**4067**		0		0	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
R Non-detect unusable data based on calibration results.
* Replicate Sample.
NYSDEC New York State Department of Environmental Conservation.
(1) Standards Criteria and Guidance values based on documents referenced in the Groundwater Feasibility Study Report (ARCADIS Geraghty & Miller 1999b).
[ ] Value exceeds associated Standard Criteria and Guidance value.
+ Based on field logs and historical data, it appears that the bottle ware for REP3 and GM-20I were switched; the corrected ids are shown on their respective site ids.

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	TRIP BLANK TB043001 04/30/01		TRIP BLANK TB050101 05/01/01		TRIP BLANK TB050201 05/02/01		TRIP BLANK TB050301 05/03/01	
Chloromethane		< 10	J	< 10	J	< 10		< 10	
Bromomethane		< 10		< 10		< 10		< 10	
Vinyl Choride		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane		< 10	J	< 10	J	< 10		< 10	
Methylene chloride		**2**	**JB**	**1**	**JB**	**2**	**JB**	**2**	**JB**
Acetone		**4**	**JB**	< 10		< 10		< 10	
Carbon disulfide		< 10		< 10		< 10		< 10	
1,1-Dichloroethene		< 10		< 10		< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10		< 10	
Chloroform		< 10		< 10		< 10		< 10	
1,2-Dichloroethane		< 10		< 10		< 10		< 10	
2-Butanone		**2**	**J**	< 10		**2**	**J**	**2**	**J**
1,1,1-Trichloroethane		< 10		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10		< 10		< 10	
Bromodichloromethane		< 10		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Trichloroethene		< 10		< 10		< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10		< 10	
Benzene		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10		< 10	
Tetrachloroethene		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10		< 10	
Toluene		< 10		< 10		< 10		< 10	
Chlorobenzene		< 10		< 10		< 10		< 10	
Ethylbenzene		< 10		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10		< 10	
Vinyl Acetate		< 10		< 10		< 10		< 10	
2-Chloroethylvinylether		< 10		< 10		< 10		< 10	
Freon 113		< 10		< 10		< 10		< 10	
				< 10					
Total VOCs		**8**		**1**		**4**		**4**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	TRIP BLANK TB050401 05/04/01		TRIP BLANK TB050701 05/07/01		TRIP BLANK TB050801 05/08/01		TRIP BLANK TB051001 05/10/01	
Chloromethane		< 10		< 10	J	< 10		< 10	
Bromomethane		< 10		< 10		< 10		< 10	
Vinyl Choride		< 0.2		< 0.2	J	< 0.2		< 0.2	
Chloroethane		< 10	J	< 10	J	< 10		< 10	
Methylene chloride		**1**	**JB**	**1**	**JB**	**1**	**JB**	**2**	**JB**
Acetone		< 10		**2**	**JB**	**2**	**JB**	< 10	
Carbon disulfide		< 10		< 10		< 10		< 10	
1,1-Dichloroethene		< 10		< 10		< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10		< 10	
Chloroform		< 10		< 10		< 10		< 10	
1,2-Dichloroethane		< 10		< 10		< 10		< 10	
2-Butanone		< 10		< 10		**2**	**JB**	**1**	**JB**
1,1,1-Trichloroethane		< 10		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10	J	< 10		< 10	
Bromodichloromethane		< 10		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Trichloroethene		< 10		< 10		< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10		< 10	
Benzene		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10		< 10	
Tetrachloroethene		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10		< 10	
Toluene		< 10		< 10		< 10		< 10	
Chlorobenzene		< 10		< 10		< 10		< 10	
Ethylbenzene		< 10		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10		< 10	
Vinyl Acetate		< 10		< 10		< 10	J	< 10	J
2-Chloroethylvinylether		< 10		< 10		< 10		< 10	
Freon 113		< 10		< 10		< 10		< 10	
Total VOCs		**1**		**3**		**5**		**3**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE:	TRIP BLANK		TRIP BLANK		TRIP BLANK		TRIP BLANK	
	SAMPLE ID:	TB051101		TB053001		TB053101		TB060101	
	DATE:	05/11/01		05/30/01		05/31/01		06/01/01	
Chloromethane		< 10		< 10	J	< 10	J	< 10	J
Bromomethane		< 10		< 10		< 10		< 10	
Vinyl Choride		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane		< 10	J	< 10		< 10		< 10	
Methylene chloride		**1**	**JB**	**2**	**JB**	**2**	**JB**	**2**	**JB**
Acetone		**2**	**JB**	< 10	J	< 10	J	**2**	**JB**
Carbon disulfide		< 10		< 10		< 10		< 10	
1,1-Dichloroethene		< 10		< 10		< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10		< 10	
Chloroform		< 10		< 10		< 10		< 10	
1,2-Dichloroethane		< 10		< 10		< 10		< 10	
2-Butanone		**1**	**JB**	< 10	J	< 10	J	< 10	J
1,1,1-Trichloroethane		< 10		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10		< 10		< 10	
Bromodichloromethane		< 10		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Trichloroethene		**0.5**	**J**	< 10		< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10		< 10	
Benzene		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10		< 10	
Tetrachloroethene		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10		< 10	
Toluene		< 10		< 10		< 10		< 10	
Chlorobenzene		< 10		< 10		< 10		< 10	
Ethylbenzene		< 10		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10		< 10	
Vinyl Acetate		< 10		< 10		< 10		< 10	
2-Chloroethylvinylether		< 10		< 10		< 10		< 10	
Freon 113		< 10		< 10		< 10		< 10	
Total VOCs		**4.5**		**2**		**2**		**4**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	TRIP BLANK TB060401 06/04/01		TRIP BLANK TB060501 06/05/01		TRIP BLANK TB060601 06/06/01		TRIP BLANK TB060701 06/07/01	
Chloromethane		< 10		< 10	J	< 10		< 10	
Bromomethane		< 10		< 10		< 10		< 10	
Vinyl Choride		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane		< 10		< 10		< 10		< 10	
Methylene chloride		**2**	**JB**	**2**	**J**	**2**	**JB**	**2**	**JB**
Acetone		< 10		< 10	J	< 10		< 10	
Carbon disulfide		< 10		< 10		< 10		< 10	
1,1-Dichloroethene		< 10		< 10		< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10		< 10	
Chloroform		< 10		< 10		< 10		< 10	
1,2-Dichloroethane		< 10		< 10		< 10		< 10	
2-Butanone		< 10		< 10	J	< 10	J	< 10	J
1,1,1-Trichloroethane		< 10		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10		< 10		< 10	
Bromodichloromethane		< 10		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Trichloroethene		< 10		< 10		< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10		< 10	
Benzene		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10	J	< 10	J
Tetrachloroethene		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10		< 10	
Toluene		< 10		< 10		< 10		< 10	
Chlorobenzene		< 10		< 10		< 10		< 10	
Ethylbenzene		< 10		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10		< 10	
Vinyl Acetate		< 10		< 10		< 10		< 10	
2-Chloroethylvinylether		< 10		< 10		< 10		< 10	
Freon 113		< 10		< 10		< 10		< 10	
Total VOCs		**2**		**2**		**2**		**2**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	TRIP BLANK TB062101 06/21/01		WATER EQ.BLANK FB043001 04/30/01		WATER EQ.BLANK FB050101 05/01/01		WATER EQ.BLANK FB050201 05/02/01	
Chloromethane		< 10		< 10	J	< 10	J	< 10	
Bromomethane		< 10		< 10		< 10		< 10	
Vinyl Choride		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane		< 10		< 10	J	< 10	J	< 10	J
Methylene chloride		**2**	**J**	**2**	**JB**	**1**	**JB**	**2**	**JB**
Acetone		< 10		**5**	**JB**	< 10		**9**	**J**
Carbon disulfide		< 10		< 10		< 10		< 10	
1,1-Dichloroethene		< 10		< 10		< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10		< 10	
Chloroform		< 10		< 10		< 10		**0.4**	**J**
1,2-Dichloroethane		< 10		< 10		< 10		< 10	
2-Butanone		< 10		**2**	**J**	< 10		< 10	
1,1,1-Trichloroethane		< 10		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10		< 10		< 10	
Bromodichloromethane		< 10		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Trichloroethene		< 10		< 10		< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10		< 10	
Benzene		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10		< 10	
Tetrachloroethene		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10		< 10	
Toluene		< 10		< 10		< 10		< 10	
Chlorobenzene		< 10		< 10		< 10		< 10	
Ethylbenzene		< 10		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10		< 10	
Vinyl Acetate		< 10		< 10		< 10		< 10	
2-Chloroethylvinylether		< 10		< 10		< 10		< 10	
Freon 113		< 10		< 10		< 10		< 10	
Total VOCs		**2**		**9**		**1**		**11.4**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	WATER EQ.BLANK FB050301 05/03/01		WATER EQ.BLANK FB050401 05/04/01		WATER EQ.BLANK FB050701 05/07/01		WATER EQ.BLANK FB050801 05/08/01	
Chloromethane		< 10		< 10		< 10	J	< 10	
Bromomethane		< 10		< 10		< 10		**0.5**	**J**
Vinyl Choride		< 0.2		< 0.2		< 0.2	J	< 0.2	
Chloroethane		< 10	J	< 10	J	< 10	J	< 10	
Methylene chloride		**2**	**JB**	**1**	**JB**	**1**	**JB**	**1**	**JB**
Acetone		**2**	**J**	**2**	**J**	**3**	**JB**	**2**	**JB**
Carbon disulfide		< 10		< 10		< 10		< 10	
1,1-Dichloroethene		< 10		< 10		< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10		< 10	
Chloroform		< 10		< 10		< 10		< 10	
1,2-Dichloroethane		< 10		< 10		< 10		< 10	
2-Butanone		< 10		< 10		**2**	**JB**	**2**	**JB**
1,1,1-Trichloroethane		< 10		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10		< 10	J	< 10	
Bromodichloromethane		< 10		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Trichloroethene		< 10		< 10		< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10		< 10	
Benzene		< 10		< 10		< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10		< 10	
Tetrachloroethene		< 10		< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10		< 10	
Toluene		< 10		< 10		< 10		< 10	
Chlorobenzene		< 10		< 10		< 10		< 10	
Ethylbenzene		< 10		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10		< 10	
Vinyl Acetate		< 10		< 10		< 10		< 10	J
2-Chloroethylvinylether		< 10		< 10		< 10		< 10	
Freon 113		< 10		< 10		< 10		< 10	
Total VOCs		**4**		**3**		**6**		**5.5**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:	WATER EQ.BLANK FB053001 05/30/01		WATER EQ.BLANK FB053101 05/31/01		WATER EQ.BLANK FB060401 06/04/01		WATER EQ.BLANK FB060501 06/05/01	
Chloromethane		< 10	J	< 10	J	< 10		< 10	J
Bromomethane		< 10		< 10		< 10		< 10	
Vinyl Choride		< 0.2		< 0.2		< 0.2		< 0.2	
Chloroethane		< 10		< 10		< 10		< 10	
Methylene chloride		**2**	**JB**	**2**	**JB**	**1**	**JB**	**2**	**J**
Acetone		< 10	J	**3**	**JB**	< 10		< 10	**J**
Carbon disulfide		< 10		< 10		< 10		< 10	
1,1-Dichloroethene		**0.7**	**J**	**0.6**	**J**	< 10		< 10	
1,1-Dichloroethane		< 10		< 10		< 10		< 10	
1,2-Dichloroethene (total)		< 10		< 10		< 10		< 10	
Chloroform		< 10		< 10		< 10		< 10	
1,2-Dichloroethane		< 10		< 10		< 10		< 10	
2-Butanone		< 10	J	< 10	J	< 10		< 10	**J**
1,1,1-Trichloroethane		< 10		< 10		< 10		< 10	
Carbon tetrachloride		< 10		< 10		< 10		< 10	
Bromodichloromethane		< 10		< 10		< 10		< 10	
1,2-Dichloropropane		< 10		< 10		< 10		< 10	
cis-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Trichloroethene		**0.3**	**J**	**0.5**	**J**	< 10		< 10	
Dibromochloromethane		< 10		< 10		< 10		< 10	
1,1,2-Trichloroethane		< 10		< 10		< 10		< 10	
Benzene		**0.2**	**J**	**0.4**	**J**	< 10		< 10	
trans-1,3-Dichloropropene		< 10		< 10		< 10		< 10	
Bromoform		< 10		< 10		< 10		< 10	
4-Methyl-2-pentanone		< 10		< 10		< 10		< 10	
2-Hexanone		< 10		< 10		< 10		< 10	
Tetrachloroethene		**0.1**	**J**	< 10		< 10		< 10	
1,1,2,2-Tetrachloroethane		< 10		< 10		< 10		< 10	
Toluene		**0.4**	**J**	**0.5**	**J**	< 10		< 10	
Chlorobenzene		**0.2**	**J**	**0.3**	**J**	< 10		< 10	
Ethylbenzene		< 10		< 10		< 10		< 10	
Styrene		< 10		< 10		< 10		< 10	
Xylene (total)		< 10		< 10		< 10		< 10	
Vinyl Acetate		< 10		< 10		< 10		< 10	
2-Chloroethylvinylether		< 10		< 10		< 10		< 10	
Freon 113		**0.3**	**J**	< 10		< 10		< 10	
Total VOCs		**4.2**		**7.3**		**1**		**2**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

Table 12. Concentrations of VOCs Detected in Blank Samples, Second Quarter 2001 Groundwater Monitoring Round, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: / SAMPLE ID: / DATE:		WATER EQ.BLANK / FB060601 / 06/06/01	
Chloromethane		<	10	
Bromomethane		<	10	
Vinyl Choride		<	0.2	
Chloroethane		<	10	
Methylene chloride			**1**	**JB**
Acetone		<	10	
Carbon disulfide		<	10	
1,1-Dichloroethene		<	10	
1,1-Dichloroethane		<	10	
1,2-Dichloroethene (total)		<	10	
Chloroform		<	10	
1,2-Dichloroethane		<	10	
2-Butanone		<	10	J
1,1,1-Trichloroethane		<	10	
Carbon tetrachloride		<	10	
Bromodichloromethane		<	10	
1,2-Dichloropropane		<	10	
cis-1,3-Dichloropropene		<	10	
Trichloroethene		<	10	
Dibromochloromethane		<	10	
1,1,2-Trichloroethane		<	10	
Benzene		<	10	
trans-1,3-Dichloropropene		<	10	
Bromoform		<	10	
4-Methyl-2-pentanone		<	10	
2-Hexanone		<	10	J
Tetrachloroethene		<	10	
1,1,2,2-Tetrachloroethane		<	10	
Toluene		<	10	
Chlorobenzene		<	10	
Ethylbenzene		<	10	
Styrene		<	10	
Xylene (total)		<	10	
Vinyl Acetate		<	10	
2-Chloroethylvinylether		<	10	
Freon 113		<	10	
Total VOCs			**1**	

VOCs Volatile organic compounds.
ug/L Micrograms per liter.
J Estimated value.
B Constituent detected in associated blank sample.
EQ Equipment

ARCADIS

Table 13. Semi-Volatile Organic Compounds Detected in Groundwater Samples, First and Second Quarter 2001 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: SAMPLE ID: DATE:	GM-14 GM-14 1/26/2001	GM-14 14 05/07/01	WATER EQ.BLANK FB050701 05/07/01
Phenol		< 10	< 0.4	< 0.4
Bis(2-chloroethyl)ether		< 10	< 1.3	< 1.3
2-Chlorophenol		< 10	< 1.2	< 1.2
1,3-Dichlorobenzene		< 10	< 0.9	< 0.9
1,4-Dichlorobenzene		< 10	< 1	< 1
1,2-Dichlorobenzene		< 10	< 1.2	< 1.2
2-Methylphenol		< 10	< 1.1	< 1.1
4-Methylphenol		< 10	< 1.1	< 1.1
N-Nitroso-di-n-propylamine		< 10	< 1.2	< 1.2
Hexachloroethane		< 10	< 1	< 1
Nitrobenzene		< 10	< 1.1	< 1.1
Isophorone		< 10	< 1	< 1
2-Nitrophenol		< 10	< 1.1	< 1.1
2,4-Dimethylphenol		< 10	< 1.8	< 1.8
Bis(2-chloroethoxy)methane		< 10	< 1.3	< 1.3
2,4-Dichlorophenol		< 10	< 1	< 1
1,2,4-Trichlorobenzene		< 10	< 1.1	< 1.1
Naphthalene		< 10	< 1.1	< 1.1
4-Chloroaniline		< 10	< 1	< 1
Hexachlorobutadiene		< 10	< 0.9	< 0.9
4-Chloro-3-methylphenol		< 10	< 0.9	< 0.9
2-Methylnapthalene		< 10	< 1.3	< 1.3
Hexachlorocyclopentadiene		< 10	< 1.3	< 1.3
2,4,6-Trichlorophenol		< 10	< 0.7	< 0.7
2,4,5-Trichlorophenol		< 25	< 0.9	< 0.9
2-Chloronaphthalene		< 10	< 1.2	< 1.2
2-Nitroaniline		< 25	< 0.9	< 0.9
Dimethylphthalate		< 10	< 0.7	< 0.7
Acenaphthylene		< 10	< 1	< 1
2,6-Dinitrotoluene		< 10	< 1	< 1
3-Nitroaniline		< 25	< 0.7	< 0.7
Acenaphthene		< 10	< 0.9	< 0.9
2,4-Dinitrophenol		< 25	< 1.6	< 1.6
4-Nitrophenol		< 25	< 0.4	< 0.4
Dibenzofuran		< 10	< 1	< 1
2,4-Dinitrotoluene		< 10	< 0.7	< 0.7
Diethylphthalate		< 10	< 0.7	< 0.7
CPPE4		< 10	< 0.7	< 0.7
Fluorene		< 10	< 0.8	< 0.8
4-Nitroaniline		< 25	< 0.6	< 0.6
4,6-Dinitro-2-methylphenol		< 25	< 1.3	< 1.3
N-Nitrosodiphenylamine (1)		< 10	< 1.5	< 1.5
Hexachlorobenzene		< 10	< 0.9	< 0.9
Pentachlorophenol		< 25	< 0.9	< 0.9
Phenanthrene		< 10	< 1	< 1
Anthracene		< 10	< 1.3	< 1.3
Carbazole		< 10	< 1	< 1
Di-n-butylphthalate		< 10	< 0.8	< 0.8
Propane, 2,2'-oxybis[1-chloro-		< 10	NA	NA

See next page for footnotes.

Table 13. Semi-Volatile Organic Compounds Detected in Groundwater Samples, First and Second Quarter 2001 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	SITE: SAMPLE ID: DATE:	GM-14 GM-14 1/26/2001	GM-14 14 05/07/01	WATER EQ.BLANK FB050701 05/07/01
Fluoranthene		< 10	< 0.8	< 0.8
Pyrene		< 10	< 1.7	< 1.7
Butylbenzylphthalate		< 10	< 2.5	< 2.5
3,3'-Dichlorobenzidine		< 10	< 1.3	< 1.3
Benzo(a)anthracene		< 10	< 1.6	< 1.6
Chrysene		< 10	< 1.3	< 1.3
Bis(2-ethylhexyl)phthalate (BEHP)		< 10	< 3.1	< 3.1
Di-n-octylphthalate		< 10	< 1	< 1
Benzo(b)fluoranthene		< 10	< 1	< 1
Benzo(k)fluoranthene		< 10	< 1.1	< 1.1
Benzo(a)pyrene		< 10	< 0.8	< 0.8
Indeno(1,2,3-cd)pyrene		< 10	< 0.7	< 0.7
Dibenz(a,h)anthracene		< 10	< 0.9	< 0.9
Benzo(g,h,i)perylene		< 10	< 0.8	< 0.8
4-bromophenyl-phenylether		< 10	< 0.9	< 0.9
Benzoic acid		NA	< 22	< 22
Benzyl alcohol		NA	< 1.3	< 1.3
Bis(2-chloroisopropyl)ether		NA	< 1.3	< 1.3

ug/L	Micrograms per liter.
B	Detected in an assoicated blank.
J	Estimated value.
NA	Not Analyzed
EQ	Equipment blank.

ARCADIS

Table 14. Total Cadmium and Chromium Detected in Groundwater Samples Collected During First and Second Quarter 2001 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

CONSTITUENT: (Units in ug/L)	NYSDEC SCGs	SITE: / SAMPLE ID: / DATE:	10631 MW-10631 1/26/2001	10631 N-10631 05/08/01	GM-16SR GM-16SR 2/2/2001	GM-16SR GM-16SR 05/08/01	GM-78S 78S 6/4/2001	GM-78I 78I 6/4/2001	GM-78I* REP2M 6/4/2001	MW-03R MW-3R 1/26/2001	MW-03R MW-3R 05/08/01	MW-03R* REP-1 05/08/01
Cadmium	5		**1.0 B**	**2.5 B**	<1.0	<0.80	<0.90	<0.90	<0.90	**32.4**	**27.6**	**27.8**
Chromium	50		**11.7**	**50.0**	<1.0	**2.9 B**	**0.80 B**	**2.6 B**	**2.5 B**	**67.6**	**69.7**	**64.8**

SCGs	Standards, Criteria, and Guidance Values.
ug/L	Micrograms per liter.
B	Detected between the IDL and CRDL.
IDL	Instrument detection limit.
CRDL	Contract required detection limit.
NYSDEC	New York State Department of Environmental Conservation.
EQ	Equipment Blanks.
	Value exceeds associated SCG value.
*	Replicate sample.
Bold	Constituent Detected above CRDL

ARCADIS

Table 14. Total Cadmium and Chromium Detected in Groundwater Samples Collected During First and Second Quarter 2001 Groundwater Monitoring Rounds, Northrop Grumman Corporation, Bethpage, New York.

		SITE:	WATER EQ.BLANK	WATER EQ.BLANK
CONSTITUENT:	NYSDEC	**SAMPLE ID:**	FB050801	FBM060401
(Units in ug/L)	SCGs	**DATE:**	05/08/01	06/04/01
Cadmium	5		<0.80	<0.90
Chromium	50		<1.0	<0.80

SCGs	Standards, Criteria, and Guidance Values.
ug/L	Micrograms per liter.
B	Detected between the IDL and CRDL.
IDL	Instrument detection limit.
CRDL	Contract required detection limit.
NYSDEC	New York State Department of Environmental Conservation.
EQ	Equipment Blanks.
	Value exceeds associated SCG value.
*	Replicate sample.
Bold	Constituent Detected above CRDL

NWIRP SITE

RUCO POLYMER SITE

PLANT 12 AREA

PLANT 5 BASINS

PLANT 2

IRM TREATMENT SYSTEMS

U.S. NAVY SITE

SOUTH BASINS

NORTHROP GRUMMAN SITE

PLANT 1 FUEL DEPOT AREA

CADMIUM/CHROMIUM MONITORING AREA

BWD SUPPLY WELLS (PLANT 4)

BWD SUPPLY WELLS (PLANT 6)

BWD SUPPLY WELL (PLANT 5)

FARMERS AVENUE

(PLAINVIEW ROAD)

BROADWAY

GRUMMAN ROAD

BLOOMINGDALE ROAD

CENTRAL AVENUE

LONG ISLAND RAILROAD

NORTH WANTAGH AVE.

HICKSVILLE ROAD

STEWART AVENUE

SEAFORD - OYSTER BAY EXPRESSWAY

HEMPSTEAD TURNPIKE

PLANT 111

PLANT 35

PLANT 37

PLANT 12

PLANT 3

PLANT 10

PLANT 22

PLANT 1

BOCES

GP-10

GP-11

MW-52D
MW-52I
MW-52S

HN-24I
HN-24I2

PW-03

HN-42I
HN-42S

HN-29I
HN-290

GM-23D
GM-23S
GM-23I

GM-72I
GM-72D
GM-72S

GM-13D

HN-40I
HN-40S

GM-16SR
GM-16I

10597

GP-3

GM-17D
GM-17SR
GM-17I

GP-1

GM-1

GM-15D
GM-15D2
GM-15S
GM-15I

GM-19S
GM-19I

GM-18D
GM-18S
GM-18I

ONCT-1

GM-33D2

MW-3R

GM-73D2

ONCT-2

GM-74D
GM-74I
GM-74D2

ONCT-3

10631

10600

GM-78S
GM-78I

GM-20D

GM-20I

GM-21D
GM-21I
GM-21S

10633

9921

GM-79D
GM-79S
GM-79I

GM-37D
GM-37D2

10624
10627
GM-75D2

10634

GM-71D2

GM-70D2

GM-35D2

N-10821
GM-36D
GM-36D2

6915

6916

3876

8941

GM-38D2
GM-38D

GM-34D
GM-34D2

8004

EXPLANATION

- OU2 REMEDIAL WELL
- INDUSTRIAL SUPPLY WELL
- EXISTING WELL/CLUSTER
- PROPOSED WELL/CLUSTER
- PROPERTY BOUNDARY OF THE RUCO POLYMER SITE
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF NWIRP SITE
- NWIRP — NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
- IRM — INTERIM REMEDIAL MEASURE
- BWD — BETHPAGE WATER DISTRICT
- AREAS OWNED BY NORTHROP GRUMMAN

0' 1000' 2000'

SCALE: 1" = 1000'

G:\APROJECT\NORTHROP GRUMMAN\CADD\OU2SYS_LOCATION.DWG 1=1000

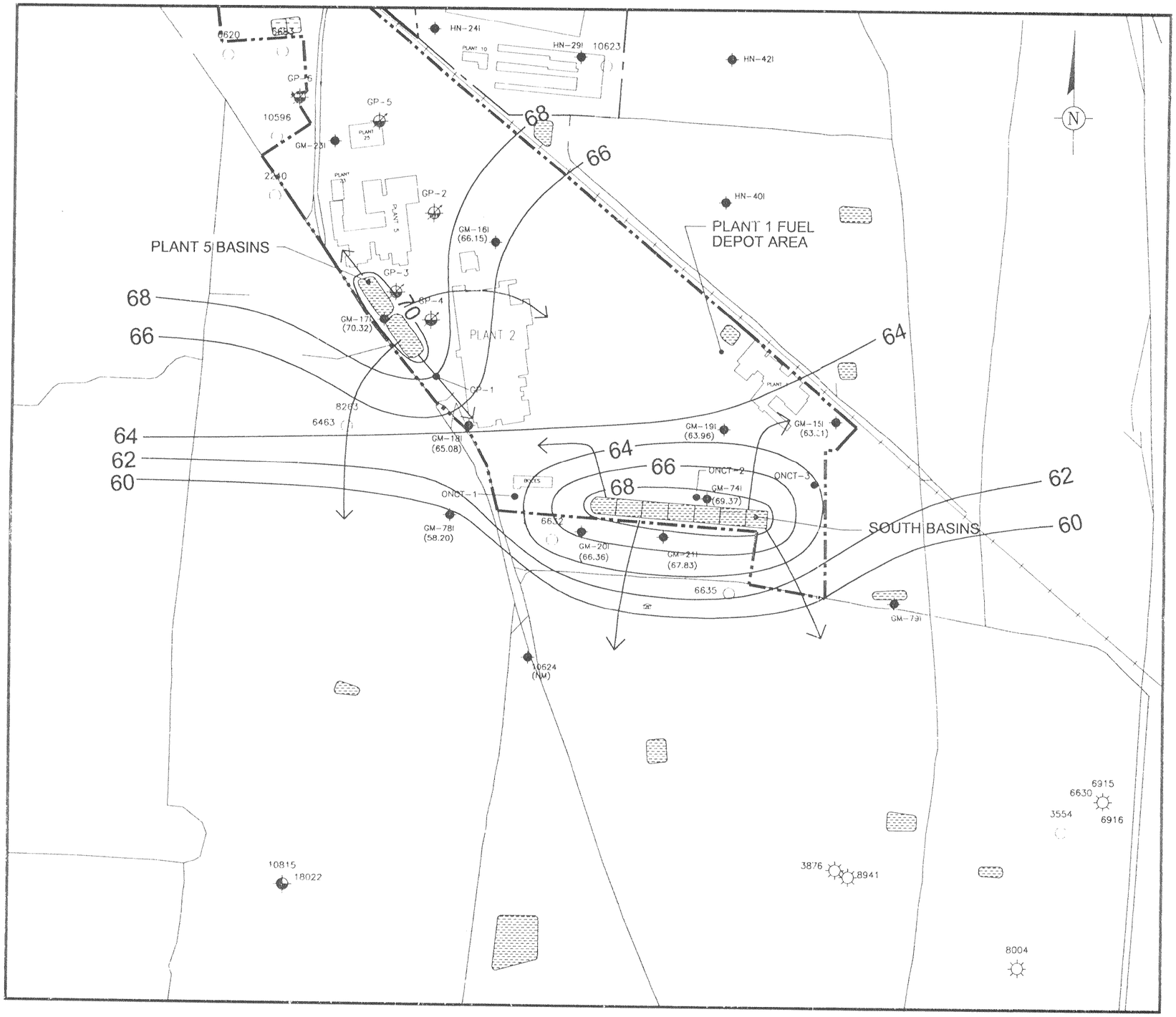
ARCADIS GERAGHTY & MILLER

NORTHROP GRUMMAN CORPORATION

BETHPAGE, NEW YORK

SITE PLAN AND IRM AND WELL LOCATIONS

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
A.G.	2/27/01	CSG	
		LEAD DESIGN PROF.	CHECKED D.S.
		PROJECT NUMBER	DRAWING NUMBER
		NY008.0210	1



0 800 FT

EXPLANATION

- PROPERTY BOUNDARY OF FORMER GRUMMAN AEROSPACE CORPORATION
- PROPERTY BOUNDARY OF THE U.S. NAVY SITE
- RECHARGE BASIN
- GM-15I (63.31) — LOCATION AND DESIGNATION OF INTERMEDIATE MONITORING WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL
- 3876 — LOCATION AND DESIGNATION OF BETHPAGE WATER DISTRICT PUBLIC SUPPLY WELL (SHOWN FOR REFERENCE ONLY)
- 9667 — LOCATION AND DESIGNATION OF ADDITIONAL WELL
- GP-16 — LOCATION AND DESIGNATION OF GRUMMAN INDUSTRIAL SUPPLY WELL (SHOWN FOR REFERENCE ONLY)
- ONCT-1 — LOCATION AND DESIGNATION OF ON-SITE OU2 EXTRACTION WELL (SHOWN FOR REFERENCE ONLY)
- HORIZONTAL COMPONENT OF GROUNDWATER FLOW
- 62 — LINE OF EQUAL WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE APPROXIMATE)
- OU2 — OPERABLE UNIT 2
- NM — NOT MEASURED

NOTES:

1. WELL INVENTORY REVISED BETWEEN AUGUST 4 AND AUGUST 23, 1995; WELL DATA OBTAINED FROM UNITED STATES GEOLOGICAL SURVEY, NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS, NASSAU COUNTY DEPARTMENT OF HEALTH, AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
2. OU2 WELLS ONCT-1, ONCT-2, ONCT-3, AND GP-1 ARE SCREENED IN THE D2 ZONE.
3. BWD WELL 3876 IS SCREENED IN THE DEEP ZONE.
4. BWD WELLS 6915, 6916, 8004, AND 8941 ARE SCREENED IN THE D2 ZONE.

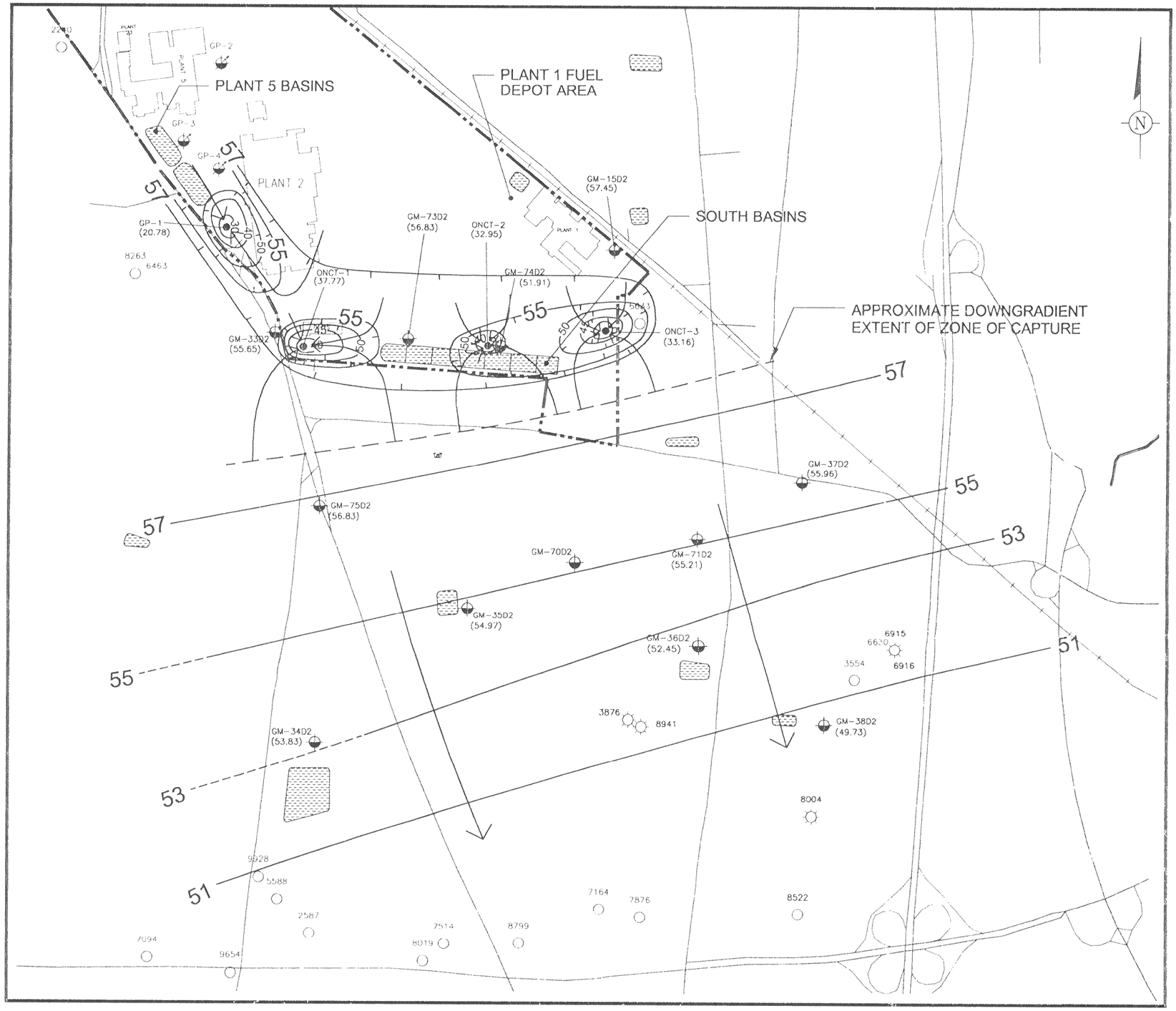
ARCADIS G&M
88 Duryea Road
Melville, New York 11747
Tel: 516/249-7600 Fax: 516/249-7610

NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

POTENTIOMETRIC SURFACE CONFIGURATION AND GROUNDWATER FLOW DIRECTIONS IN THE INTERMEDIATE ZONE
MAY 24, 2001

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
AG	12/4/01	CSG	MW
		LEAD DESIGN PROF.	CHECKED
			DES
		PROJECT NUMBER	DRAWING NUMBER
		NY001321.002	3

G:\PROJECT\GRUMMAN\CAD\GRUMMANINTER_5_01.DWG



0 800 FT

EXPLANATION

- PROPERTY BOUNDARY OF FORMER GRUMMAN AEROSPACE CORPORATION
- RECHARGE BASIN
- GM-36D2 (52.45) — LOCATION AND DESIGNATION OF D2 (VERY DEEP) MONITORING WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL.
- 3876 — LOCATION AND DESIGNATION OF BETHPAGE WATER DISTRICT PUBLIC SUPPLY WELL
- 9667 — LOCATION AND DESIGNATION OF ADDITIONAL WELL
- GP-16 — LOCATION AND DESIGNATION OF GRUMMAN PRODUCTION WELL
- ONCT-3 (33.16) — LOCATION AND DESIGNATION OF ON-SITE OU2 EXTRACTION WELL AND WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL
- HORIZONTAL COMPONENT OF GROUNDWATER FLOW
- OU2 — OPERABLE UNIT 2
- 52 — LINE OF EQUAL WATER-LEVEL ELEVATION IN FEET RELATIVE TO MEAN SEA LEVEL (FT. MSL) (DASHED WHERE APPROXIMATE)
- LINE OF EQUAL WATER LEVEL ELEVATION DENOTING A DECREASE IN POTENTIOMETRIC SURFACE ELEVATION IN FT. MSL.

NOTES:

1. WELL INVENTORY REVISED BETWEEN AUGUST 4 AND AUGUST 23, 1995; WELL DATA OBTAINED FROM UNITED STATES GEOLOGICAL SURVEY, NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS, NASSAU COUNTY DEPARTMENT OF HEALTH, AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
2. OU2 WELLS GP-1, ONCT-1, ONCT-2, AND ONCT-3 ARE SCREENED IN THE D2 ZONE AND WERE PUMPING AT 1150 GPM, 826 GPM, 1045 GPM, AND 1024 GPM, RESPECTIVELY AT THE TIME OF MEASUREMENT.
3. BWD WELL 3876 IS SCREENED IN THE DEEP ZONE.
4. BWD WELLS 6915, 6916, 8004, AND 8941 ARE SCREENED IN THE D2 ZONE.

ARCADIS G&M
88 Duryea Road
Melville, New York 11747
Tel: 516/249-7600 Fax: 516/249-7610

NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

POTENTIOMETRIC SURFACE CONFIGURATION AND GROUNDWATER FLOW DIRECTIONS IN THE D2 ZONE
MAY 24, 2001

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
AG	12/4/01	CGS	MW
		LEAD DESIGN PROF.	CHECKED
			DES
		PROJECT NUMBER	DRAWING NUMBER
		NY001321.002	4

ARCADIS

Appendix A

Water-Level Measurement Logs

ARCADIS GERAGHTY & MILLER

Water Level/Pumping Test Record

Project NY001032.0001.00002 Well GRUMMAN Site BETHPAGE

Screen Setting _____ Measuring Point Description _____ Height Above Ground Surface _____

Static Water Level _____ Measured With _____ Date/Time 5/24/01

Drawdown ☐ Start of Test _____ Pumping Well _____

Recovery ☐ End of Test _____

Distance From Well Measured To Pumping Well® _____ Discharge Rate _____ Orifice _____

Date & Time	Well Or t (mins)	Held (ft)	Wet (ft)	Depth to Water (ft)	s (ft)	Dew. 1) Corr. (ft)	Art. 2) s' (ft)		Q (gpm)	Mano-meter (in)	Remarks 3)
11:52	GM-78I			43.04							
11:56	N-9921			33.89							
12:02	N-10627			33.85							
12:03	GM-75D2			36.80							
12:17	N-10634			41.14							
12:25	GM-71D2			43.24							
12:29	GM-70D2			42.55							
12:37	N-10821			35.49							
12:37	GM-36D2			39.15							
12:44	GM-36D			36.51							
12:51	GM-38D2			41.83							
12:54	GM-38D			39.49							
1:02	GM-37D			40.50							
1:06	GM-37D2			41.21							
1:13	GM-79D			42.92							
1:16	GM-79I			41.36							
1:19	N-10628	GM-77S		40.65							
1:24	GM-21I			37.39							
1:27	GM-21S			33.81							
2:08	N-10633			39.22							
2:13	GM-21D			39.61							
2:19	GM-21I			37.52							
2:23	N-10631			40.38							
2:25	GM-33D2			51.20							
2:29	GM-18S			42.77							
2:34	GM-18D			40.90							

1) Dewatering Correction 2) Equivalent Artesian Drawdown 3) pH, Spec. Cond., Temp., Weather, Sand, Turbidity, etc.

ARCADIS GERAGHTY & MILLER

Water Level/Pumping Test Record

Page 1 of 3

Project N400 1039.0001.00002 Well GRUMMAN Site BETHPAGE, NY

Screen Setting _____ Measuring Point Description _____ Height Above Ground Surface _____

Static Water Level _____ Measured With _____ Date/Time 5/24/01

Drawdown ☐ Start of Test _____ Pumping Well _____

Recovery ☐ End of Test _____

Distance From Well Measured To Pumping Well® _____ Discharge Rate _____ Orifice _____

Date & Time	Well Or t (mins)	Held (ft)	Wet (ft)	Depth to Water (ft)	s (ft)	Dew. 1) Corr. (ft)	Art. 2) s' (ft)		Q (gpm)	Mano-meter (in)	Remarks 3)
9:08	GM74D2			55.45							
9:10	GM74D			46.45							
9:12	GM 74I			38.05							
9:16	ONCT-2			77.05					1045		
9:20	GM-73D2			47.79							
9:25	ONCT-1			166.33					826		
9:33	GM-13D			48.48							
9:52	GM-16I			49.66							
9:59	GM-16SR			49.54							
10:15	ONCT-3			75.54					1024		
10:19	GM-15S			46.02							
10:24	GM-15I			45.82							
10:26	GM-15D2			52.14							
10:28	GM-15D			48.71							
10:34	GM-19S			43.47							
10:36	GM-19I			44.04							
10:47	GM-34D			15.78							
10:48	GM-34D2			17.36							
11:13	GP-1			96					1150		LENGTH OF AIRLINE = 120
											READING = 96
11:26	GP-3			—					400		
11:30	GM-17SR			45.32							
11:33	GM-17I			45.51							
11:35	GM-17D			50.89							
11:42	N-10600			40.28							
11:47	GM-78S			46.74							

1) Dewatering Correction 2) Equivalent Artesian Drawdown 3) pH, Spec. Cond., Temp., Weather, Sand, Turbidity, etc.

5/24/01

~~NY001330~~ NY001039.0001.00002

GRUMMAN
BETHPAGE, NY

TIME	WELL #	DTW
2:37	GM-18I	43.95
2:43	N-10597	43.39
2:50	GM-35D2	41.31

DAVID SCHWEDOCK

718-347-3252

ARCADIS

Appendix B

Groundwater Sampling Logs

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 15D2

Date: 30 April 2001 Sampled By: MS KS

Sampling Time: 1130 Recorded By: MS

Weather: 65° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow Madden

Casing Diameter: 4" Purge Rate: 500 ml/minute

Total Depth: 556 Total Volume Purged: 10 GALLONS

Depth to Water: 48.21 Pump Intake Depth: 546

Water Column: Pump on: 1115 Off:

Gallons/Foot: Parameters Sampled: check COC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1150				240	6.26	59.2	19.0	48.21'	4.97	
1155				247	5.99	58.9	18.5	-	4.90	
1200				261	5.92	57.9	18.3	-	4.63	
1205				263	5.78	57.0	18.1	48.21'	4.60	
1210				277	5.57	56.1	18.1	-	5.65	
1115				282	5.51	55.3	18.0	-	5.92	
1220				287	5.44	54.6	18.1	48.21'	5.98	
1225				296	5.45	53.9	18.1	-	5.92	
1230				306	5.37	53.6	18.2	-	6.81	
1235				305	5.39	50.7	18.2	48.21'	6.26	
1240				292	5.38	51.0	18.2	-	7.07	
1245				292	5.42	49.6	18.3	-	7.89	
1250				290	5.41	51.7	18.3	48.21'	7.63	
1255				286	5.42	50.5	18.3	-	7.64	
1300				286	5.41	49.8	18.3	-	7.64	
1305			13.54	285	5.42	49.7	18.3	48.21'	7.63	

* system not on

Well Secure: Purge Water Disposal: on site treatment

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 15D

Date: 30 April Sampled By: MS KS

Sampling Time: 2:50 Recorded By: MS

Weather: 70° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow bladder

Casing Diameter: 4" Purge Rate: 450 ml/min

Total Depth: ~~47.10~~ 342' Total Volume Purged: 8 gal

Depth to Water: 47.10 Pump Intake Depth: 337'

Water Column: Pump on: 1:45 Off: 2:55

Gallons/Foot: Parameters Sampled:

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1:50	450			302	5.32	183.7	21.4	47.10	3.49	
1:55				314	5.18	183.4	19.3		3.94	
2:00				323	5.11	183.0	18.6		4.71	
2:05				268	5.78	184.5	18.3	47.28	5.01	
2:10				197	5.73	193.4	19.3		5.15	
2:15				197	5.77	193.9	19.9		5.46	
2:20				214	5.69	191.5	20.0	47.50	6.87	
2:25				228	5.63	187.8	20.2		6.93	
2:30				236	5.52	186.9	20.8		6.30	
2:35				244	5.46	185.3	21.1	47.50	5.52	
2:40				249	5.42	184.3	21.1		3.20	
2:45				252	5.39	184.5	21.0		2.90	
2:50		8 gal	34.1	257	5.33	184.1	21.1	47.52	2.81	

* System not on

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 17 ~~S~~ D
Date: 1 May 2001 Sampled By: MS KS
Sampling Time: 1120 Recorded By: KS / MS
Weather: 75° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow bladder
Casing Diameter: 4" Purge Rate: 450 mL/min
Total Depth: 120 Total Volume Purged:
Depth to Water: 50.28 Pump Intake Depth: 110'
Water Column: 69.72' Pump on: 1120 Off:
Gallons/Foot: Parameters Sampled: Check TOC
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1125				314	6.00	133.8	23.0	50.28'	5.97	
1130				315	5.91	134.8	23.0	—	5.91	
1135				312	5.71	134.2	24.0	—	6.20	
1140				322	5.98	132.2	25.3	50.32'	5.91	
1145				322	5.54	132.4	25.3	—	7.71	
1150				320	5.50	124.9	26.5	—	6.08	
1155				301	5.65	125.8	25.6	50.31'	7.59	
1200				289	5.64	126.1	24.2	—	7.73	
1205				291	5.62	126.9	23.4	—	7.74	
1210				282	5.58	131.1	23.2	50.30'	7.82	
1215				282	5.58	130.6	23.1	—	7.81	
1220				282	5.59	131.6	23.1	—	7.83	
1225			3.37	282	5.59	131.6	23.2	50.30'	7.82	

System off

Well Secure:
Color: colorless odorless
Purge Water Disposal: on site
Turbidity(qualitative): clear

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 167

Date: 1 May 2001 Sampled By: MS KS

Sampling Time: 12:35 Recorded By: MS

Weather: 85° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow | ded bladder

Casing Diameter: 4" Purge Rate: 450 mL/min

Total Depth: 145 Total Volume Purged: 8 gal

Depth to Water: 49.72 Pump Intake Depth:

Water Column: Pump on: 1:25 Off: 2:40

Gallons/Foot: Parameters Sampled:

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1:35	450			251	6.76	345	19.6	49.72	3.82	
1:40				255	6.89	365	17.7		0.73	
1:45				255	6.89	367	17.4		0.67	
1:50				259	6.97	368	17.1	49.70	0.69	
1:55				249	7.01	366	17.0		0.71	
2:00				246	7.03	367	16.9		0.59	
2:05				246	7.03	367	16.8	49.72	0.65	
2:10				243	7.06	366	16.9		0.79	
2:15				240	7.04	367	16.8		0.72	
2:20				239	7.05	367	16.8	49.75	0.63	
2:25				239	7.07	355	16.9		0.64	
2:30				236	7.08	355	16.9		0.62	
2:35		8 gal	22.3	236	7.09	355	16.8	49.72	0.58	

system off

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 15 I

Date: 1 May 2001 Sampled By: MS KS

Sampling Time: 10:30 Recorded By: MS

Weather: 65° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow /ded. bladder

Casing Diameter: 4" Purge Rate: 450

Total Depth: 105 Total Volume Purged: 8 gal

Depth to Water: 45.41 Pump Intake Depth:

Water Column: Pump on: 9:20 Off: 10:35

Gallons/Foot: Parameters Sampled:

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
9:30	450			244	6.11	158.5	17.3	45.41	6.60	
9:35				266	5.88	159.3	16.7		5.86	
9:40				275	5.90	138.8	16.3		5.60	
9:45				286	5.88	182.0	16.3	45.45	5.48	
9:50				286	5.85	180.0	16.4		5.18	
9:55				289	5.84	179.2	16.3		4.82	
10:00				289	5.84	178	16.3	45.47	5.54	
10:05				296	5.82	177	16.5		4.80	
10:10				297	5.78	176	16.5		5.13	
10:15				305	5.78	176	16.5	45.48	5.08	
10:20				302	5.75	175	16.6		5.40	
10:25				303	5.73	174	16.4		5.28	
10:30		8 gal	45	305	5.75	177	16.7	45.25	5.39	

system off

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 15S
Date: 5.2.01 Sampled By: CK | KS
Sampling Time: 10:25 Recorded By: CK | KS
Weather: SUNNY, 80's Coded Replicate No.: —

WELL IMFORMATION

Casing Material: PVC Purge Method: 2" SUBMERSIBLE GRUNDFOS
Casing Diameter: 4" Purge Rate: 1.5 gpm
Total Depth: 80 Total Volume Purged: 75 gal
Depth to Water: 45.84 Pump Intake Depth: 75
Water Column: 34.16 Pump on: 9:35 Off:
Gallons/Foot: 0.65 Parameters Sampled: SEE COC
Gallons in Well: 22.27 Q ≈ 1.5 gpm T ≈ 16 MIN

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
9:37					6.20	180	18.8			INIT
9:51					5.25	186	16.7			
10:07					5.19	189	16.5			
10:23			19.5		5.17	190	16.5			3V

Well Secure: YES Purge Water Disposal: POTW
Color: CLEAR Turbidity(qualitative): CLEAR
PID = <1 ppm

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 17-SR

Date: 5-2-01 Sampled By: CR | KS

Sampling Time: 12:45 Recorded By: CR | KS

Weather: Sunny, 80's Coded Replicate No.: —

WELL IMFORMATION

Casing Material: PVC Purge Method: 2" SUBMERSIBLE GRUNDFOS

Casing Diameter: 4" Purge Rate: 1.5 gpm

Total Depth: 70 Total Volume Purged: 60

Depth to Water: 45.16 Pump Intake Depth: 65

Water Column: 24.84 Pump on: 1205 Off: 1245

Gallons/Foot: 0.65 Parameters Sampled: TCE CDC

Gallons in Well: 16.15 Q 21.5 gpm T = 12 min

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1205					6.53	119.7	21.6			
1219					6.44	125.0	20.2			
1229					6.39	126.4	20.2			
1241			19.9		6.42	123.5	20.0			

Well Secure: YES Purge Water Disposal: POTW

Color: COLORLESS Turbidity(qualitative): CLEAR

PID = <1 ppm

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321 Task: 00002 Well ID: 17I
Date: 5.2.01 Sampled By: CK/LS
Sampling Time: 14:10 Recorded By: CK/LS
Weather: SUNNY, 80's Coded Replicate No.: —

WELL IMFORMATION

Casing Material: PVC Purge Method: 2" SUBMERSIBLE GRUNDFOS
Casing Diameter: 4" Purge Rate: 450 mL/MIN
Total Depth: 120 Total Volume Purged: ~ 8 gal
Depth to Water: 45.40 Pump Intake Depth: 110
Water Column: Pump on: 1307 Off: 14:12
Gallons/Foot: 0.65 Parameters Sampled: ~~TCE~~ COC
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1310	450			242	6.42	127.9	20.1	45.40	7.37	
1315				252	6.37	124.4	19.6	—	7.97	
1320				258	6.33	124.5	19.5	—	7.97	
1325				260	6.31	124.3	20.4	45.43	6.73	
1330				262	6.31	124.9	20.9	—	6.72	
1335				262	6.29	123.6	21.0	—	6.43	
1340				258	6.28	123.4	21.5	45.44	6.46	
1345				259	6.29	123.3	21.6	—	6.45	
1350				265	6.26	123.6	21.1	—	6.48	
1355				258	6.19	124.1	20.7	45.45	7.07	
1400				258	6.22	123.1	20.6	—	7.17	
1405				258	6.22	123.2	20.3	—	7.13	
1410	↓		7.1	260	6.21	123.1	20.3	45.44	6.80	

Well Secure: YES Purge Water Disposal: POTW
Color: COLORLESS Turbidity(qualitative): CLEAR

PID = <1 PPM

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: N4001321.0001 Task: 00002 Well ID: 79 D

Date: 3 May 2001 Sampled By: MS SH

Sampling Time: 11:20 Recorded By: MS

Weather: 80° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow bladder

Casing Diameter: 4" Purge Rate: ~~450~~ 450 mL/min

Total Depth: 290 Total Volume Purged: 8 gal

Depth to Water: 42.65 Pump Intake Depth: 285

Water Column: Pump on: 10:05 Off: 11:20

Gallons/Foot: Parameters Sampled:

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
10:15	450			237	6.87	84.7	22.3	42.65	3.42	
10:20				250	6.25	84.3	19.0		2.93	
10:25				258	6.12	84.6	18.1		0.85	
10:30				227	6.00	~~1402~~ 140.2	17.6	42.80	0.87	
10:35				180	6.06	143.6	18.1		0.49	
10:40				176	6.03	143.9	18.1		0.47	
10:45				171	5.96	142.2	18.2	42.72	0.44	
10:50				175	5.92	141.0	18.2		0.44	
10:55				180	5.87	140.0	18.1		0.47	
11:00				189	5.85	139.0	17.9	42.83	0.44	
11:05				191	5.81	138.4	18.1		0.48	
11:10				191	5.79	137.9	18.1		0.46	
11:15		8 gal	>200	193	5.77	137.2	18.2	42.80	0.45	

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): turbid (>200)

odorless

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: N4001321.0001 Task: 00002 Well ID: 34D2

Date: 3 May 2001 Sampled By: MS SH

Sampling Time: 11:40 Recorded By: MS

Weather: 90° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow bladder

Casing Diameter: 4" Purge Rate: 450 mL/min

Total Depth: 520 Total Volume Purged: 8 gal

Depth to Water: 17.67 Pump Intake Depth: 515

Water Column: Pump on: 12:35 Off:

Gallons/Foot: Parameters Sampled:

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
12:40	450			142	6.25	516.2	25.8	17.67	2.68	
12:45				61	6.97	53.7	21.3		0.70	
12:50				4	7.03	52.5	20.0		0.42	
12:55				22	7.13	51.9	19.4	17.80	0.39	
1:00				20	7.21	51.3	19.2		0.35	
1:05				7	7.33	50.4	19.0		0.32	
1:10				16	7.45	49.7	18.9	17.78	0.33	
1:15				16	7.54	49.3	19.0		0.36	
1:20				11	7.21	55.9	19.1		0.66	
1:25				56	6.87	57.7	19.3	17.75	1.13	
1:30				101	6.51	60.6	19.3		1.87	
1:35				122	6.28	61.7	19.2		1.67	
1:40		8 gal	125	116	6.41	60.4	19.3	17.78	1.78	

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): slight (-125)

odorless

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 34D

Date: 5/3/01 Sampled By: SH/MS

Sampling Time: 3[15] Recorded By: SH

Weather: 98° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: steel Purge Method: Low Flow Bladder

Casing Diameter: 2" Purge Rate: 450 ml/mn

Total Depth: 319 Total Volume Purged: 8.8 Gal

Depth to Water: 15.51 Pump Intake Depth: 314

Water Column: Pump on: 2[05] Off:

Gallons/Foot: Parameters Sampled: See CoC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
Z[10]	[illegible]			10	6.97	193	20.3	15.51	1.68	
Z[15]	450			26	7.31	195	19.5	–	1.27	
Z[20]				48	7.60	197	19.5	–	1.38	
Z[25]				64	7.73	197	19.6	15.51	3.09	
Z[30]				15	8.14	190	19.2	–	1.29	
Z[35]				-31	8.74	192	19.2	–	.78	
Z[40]				-48	9.11	191	19.0	15.52	1.08	
Z[45]				-12	7.84	203	16.5	–	1.86	
Z[50]				19	7.33	203	16.4	–	2.50	
Z[55]				40	7.07	201	16.3	15.53	3.24	
3[00]				68	6.77	199	17.4	–	3.40	
3[05]				78	6.70	201	18.2	–	4.69	
3[10]				88	6.56	198	18.9	15.55	3.48	
3[15]				94	6.51	203	19.0	–	3.43	
3[20]				105	6.48	202	19.0	15.55	3.50	

Well Secure: Yes Purge Water Disposal: NC Sewer

Color: Turbidity(qualitative):

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: MW-40I
Date: 3 May 2001 Sampled By: MS KS
Sampling Time: 11:30 Recorded By: MS
Weather: 85° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow submersible
Casing Diameter: 4" Purge Rate: 450 mL/min
Total Depth: 125 Total Volume Purged: 8 gal
Depth to Water: 50.33 Pump Intake Depth: 120
Water Column: Pump on: 10:25 Off: 11:35
Gallons/Foot: Parameters Sampled:
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
10:30	450			205	6.13	219	17.1	50.33	7.62	
10:35				227	6.20	221	17.4		6.73	
10:40				237	6.19	222	17.0		6.83	
10:45				240	6.18	222	17.0	50.45	7.15	
10:50				243	6.17	221	17.2		6.82	
10:55				245	6.16	220	17.3		7.24	
11:00				247	6.14	219	17.4	50.46	6.84	
11:05				248	6.13	217	17.7		6.40	
11:10				250	6.08	217	18.2		8.06	
11:15				252	6.09	217	17.4	50.50	6.46	
11:20				253	6.06	215	17.2		7.13	
11:25				254	6.04	214	17.2		7.39	
11:30		8 gal	8.4	255	6.03	213	17.4	50.36	7.30	

Well Secure: Purge Water Disposal: on site
Color: colorless Turbidity(qualitative): clear
odorless

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: HN-40S

Date: 4 May 2001 Sampled By: MS KS

Sampling Time: _____ Recorded By: MS

Weather: 80° Sunny Coded Replicate No.: _____

WELL IMFORMATION

Casing Material: PVC Purge Method: ~~&~~ submersible

Casing Diameter: 4" Purge Rate: 1.5 ~~7.0~~ gal / min

Total Depth: 70 (60) Total Volume Purged: 41 gal

Depth to Water: 50.41 Pump Intake Depth: 65'

Water Column: 20 Pump on: 9:30 Off: 10:05

Gallons/Foot: 0.67 Parameters Sampled: _____

Gallons in Well: 13 x3 = 41 gal

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
9:35 I	1 gal/min	0			7.80	177.9	17.9	50.41		
9:44 IV		13			5.66	181.5	16.9			
9:53 2V		~~27~~			5.52	182.1	16.7			
10:02 3V		41	2.37		5.52	172.8	16.6			

Well Secure: _____ Purge Water Disposal: on site

Color: colorless odorless Turbidity(qualitative): clear

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00007 Well ID: HN - 42 I

Date: 4 May 2001 Sampled By: MS KS

Sampling Time: 2:00 Recorded By: MS

Weather: 90° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow sub. 2"

Casing Diameter: 4" Purge Rate: 450 mL/min

Total Depth: 52.56' Total Volume Purged: 8 gal

Depth to Water: ~110' Pump Intake Depth: 102'

Water Column: Pump on: 1:00 Off: 2:05

Gallons/Foot: Parameters Sampled:

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1:05	450			4	11.70	1017	18.8	52.56	7.05	
1:10				0	11.83	1042	20.6		6.07	
1:15				1	11.78	1014	22.7		7.24	
1:20				4	11.68	986	25.7	52.71	6.97	
1:25				6	11.66	971	26.4		6.90	
1:30				8	11.66	950	26.7		6.79	
1:35				11	11.66	943	26.6	52.68	6.80	
1:40				13	11.66	930	26.6		6.81	
1:45				15	11.65	908	27.1		6.83	
1:50				16	11.64	904	27.4	52.51	6.92	
1:55				19	11.62	892	27.6		6.85	
2:00		8 gal	18.7	18	11.61	875	28.0	52.55	10.92	

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: N4001321.0001 Task: 00002 Well ID: HN-42S

Date: 4 May 2001 Sampled By: MS KS

Sampling Time: 12:48 Recorded By: MS

Weather: 90° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: ~~Bow~~ sk: submersible 2"

Casing Diameter: 4" Purge Rate: 1.5 spm

Total Depth: 70 Total Volume Purged: 36 gal

Depth to Water: 53.24 Pump Intake Depth: 65'

Water Column: 17' Pump on: 12:20 Off: 12:50

Gallons/Foot: .67 Parameters Sampled:

Gallons in Well: 17(x3=36)

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
12:23	1.5 spm	0			6.04	170.2	18.0	53.24		
12:31		12			5.70	174.8	16.7			
12:39		24			5.68	172.6	16.6			
12:47		36	2.1		5.70	174.7	16.9			

Well Secure: Purge Water Disposal: on site

Color: colorless odorless Turbidity(qualitative): clear

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: N001321.0001 Task: 00002 Well ID: N-10634

Date: 7 MAY 2001 Sampled By: MS KS

Sampling Time: 2:00 Recorded By: MS

Weather: 65° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: ~~PVC~~ Steel Purge Method: ~~Bladder~~ submersible

Casing Diameter: 2" Purge Rate: 1.5 gal/min

Total Depth: 67 Total Volume Purged:

Depth to Water: 41.09 Pump Intake Depth: 65'

Water Column: 26' Pump on: 1:45 Off: 2:00

Gallons/Foot: 0.16 Parameters Sampled:

Gallons in Well: 4.2 · 3 ≈ 13

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1:47	1.5 gpm	0			7.30	156.1	16.0	41.09		
1:50		4			6.49	161.5	14.9			
1:53		8			6.04	162.5	14.5			
1:57		13	33.8		5.85	163.4	14.3			

Well Secure:

Color: colorless odorless

Purge Water Disposal: on site

Turbidity(qualitative): clear

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: N4001321.0001 Task: 00002 Well ID: 79 I

Date: 7 May 2001 Sampled By: MS KS

Sampling Time: 12:25 Recorded By: MS

Weather: 65° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: low flow pub.

Casing Diameter: 4" Purge Rate: 450 mL/min

Total Depth: 180 Total Volume Purged: 8 gal

Depth to Water: 41.25 Pump Intake Depth: 175

Water Column: Pump on: 11:20 Off: 12:30

Gallons/Foot: Parameters Sampled:

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
11:25	450			174	8.52	276	13.0	41.25	4.28	
11:30				228	7.03	256	17.0		1.39	
11:35				239	6.65	242	16.0		1.54	
11:40				243	6.52	241	16.2	41.30	1.28	
11:45				245	6.36	229	19.6		1.616	
11:50				239	6.30	228	19.3		1.55	
11:55				243	6.25	227	19.5	41.40	1.68	
12:00				238	6.21	226	19.7		1.49	
12:05				241	6.15	225	19.3		1.32	
12:10				238	6.11	222	18.9	41.30	1.60	
12:15				242	6.05	214	18.4		1.40	
12:20				238	6.01	207	18.1		1.47	
12:25		8 gal	>200	242	5.99	206	18.1	41.28	1.36	

Well Secure: Purge Water Disposal: on site

Color: brown tint odorless Turbidity(qualitative): v. turbid

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: N4001321.0001 Task: 00002 Well ID: 14

Date: 7 MAY 2001 Sampled By: MS KS

Sampling Time: 3:06 Recorded By: MS

Weather: 65° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: submersible

Casing Diameter: 4" Purge Rate: 1 gpm

Total Depth: 55' Total Volume Purged: 24 gal

Depth to Water: 44.15 Pump Intake Depth: 50'

Water Column: 11' Pump on: 2:40 Off: 3:10

Gallons/Foot: 0.67 Parameters Sampled:

Gallons in Well: 8 gal

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
2:42	1 gpm	0			6.07	1128.5	16.3	44.15		
2:50		8			5.68	1128	16.3			
2:58		16			5.68	174.1	16.3			
3:06		24	7.8		5.65	169.9	16.3			

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: N-1D631

Date: 8 MAY 2001 Sampled By: MS GW

Sampling Time: 2:05 Recorded By: MS

Weather: 65° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: Purge Method: 2" sub.

Casing Diameter: 2" Purge Rate: 1.5 spm

Total Depth: 67 Total Volume Purged:

Depth to Water: 40.29 Pump Intake Depth:

Water Column: 27' Pump on: 1:51 Off:

Gallons/Foot: 0.16 Parameters Sampled:

Gallons in Well: (4.3)~5 gal

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1:51	1.5spm	0	>200		6.59	270	16.7	40.29		
1:54		4.5	>200		6.41	167.2	16.7			
1:57		9.0	65.2		6.36	137.3	17.0			
2:01		15.0	37.7		6.21	136.7	16.7			
2:03		19.5	14.9		6.22	131.5	16.9			

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: N400321.0001 Task: 00002 Well ID: MW-3R
Date: 8 MAY 2001 Sampled By: MS GW
Sampling Time: 3:17 Recorded By: MS
Weather: 65° Sunny Coded Replicate No.: REP1, MS, MSD

WELL IMFORMATION

Casing Material: _____ Purge Method: 2" Sub.
Casing Diameter: 2" Purge Rate: 1 gpm
Total Depth: 55' Total Volume Purged: _____
Depth to Water: 37.13 Pump Intake Depth: 53'
Water Column: 18' Pump on: 3:05 Off: _____
Gallons/Foot: ~~0.16~~ Parameters Sampled: _____
Gallons in Well: 3 gal

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
3:05	1gpm	0	>200		6.29	143.3	16.2			
3:08		3	>200		6.23	133.1	16.6			
3:11		6	29.1		6.21	131.7	16.5			
3:14		9	14		6.24	131.5	16.7			

Well Secure: _____ Purge Water Disposal: on site
Color: colorless Turbidity(qualitative): clear.
odorless

ARCADIS GERAGHTY & MILLER

~~Low-Flow~~ Groundwater Sampling Log

Project Number: N4001321.0001 Task: 00002 Well ID: 16SR

Date: 8 MAY 2001 Sampled By: MS GW

Sampling Time: 4:25 Recorded By: MS

Weather: 65° Sunny Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: 2" Sub.

Casing Diameter: 4" Purge Rate: 2 GPM

Total Depth: 70' Total Volume Purged:

Depth to Water: 49.38 Pump Intake Depth:

Water Column: 21' Pump on: 4:02 Off: 4:30

Gallons/Foot: 0.65 Parameters Sampled:

Gallons in Well: 14 (.3 = 42)

FIELD PARAMETER MEASUREMENTS

	Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
I	4:02	2gpm	0	13.3		6.09	153.6	17.9	49.38		
1V	4:09		14	6.12		6.05	151.3	18.1			
2V	4:16		21	4.28		5.99	151.7	18.5			
3V	4:23		28	1.91		5.92	153.8	18.5			

Well Secure: Purge Water Disposal: on site

Color: colorless Turbidity(qualitative): clear

odorless

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: GRUMMAN | Project No.: NY001321.0001.00002 | Page: 1 of 1

Site Location: Bethpage, NY | Date: 5/10/01

Site/Well No.: GM-71D2 | Replicate No.: | Code No.:

Weather: Sunny, 80° | Sampling Time: Begin 1040 End 1220

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	464.00'
Depth to Water (ft bmp)	442.00'
Water-Level Elevation (ft)	
Water Column in Well (ft)	22.00'
Casing Diameter/Type	4"(.65)
Gallons in Well	14.30
Gallons Pumped/Bailed Prior to Sampling	43.00
~~Sample Pump Intake Setting (ft bmp)~~ Packer Pressure:	230 PSI
Purge Time	begin 1040 end 1220
Pumping Rate (gpm)	
Evacuation Method	Dedicated bladder pump

Field Parameters

Field Parameters	I	1V	2V	3V
Color				colorless
Odor				Colorless
Appearance				clear
pH (s.u.)	7.98	6.34	6.03	5.89
Conductivity ~~(mS/cm)~~ (µmhos/cm)	118.6	110.1	111.1	113.2
Turbidity (NTU)				3.2
Temperature (°C)	20.2	17.1	17.4	17.2
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks: 5 gal Pails: TTL 1111 Split w/ HZM

DTW: 43.98'

Constituents Sampled	Container Description	Number	Preservative
Check COC			

Sampling Personnel: K. Shiff

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: GRumman | Project No.: NY001321.0001.00002 | Page: 1 of 1

Site Location: Bethpage, NY | Date: 5/10/01

Site/Well No.: GM-70 D2 | Replicate No.: | Code No.:

Weather: Sunny, 80° | Sampling Time: Begin 1330 End 1450

Evacuation Data	
Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	330.00'
Depth to Water (ft bmp)	308.00'
Water-Level Elevation (ft)	
Water Column in Well (ft)	22.00'
Casing Diameter/Type	4"(.65)
Gallons in Well	14.30
Gallons Pumped/Bailed Prior to Sampling	43.00
~~Sample Pump Intake~~ Packer Setting (ft bmp)	Pressure: 150 PSI
Purge Time	begin 1330 end 1450
Pumping Rate (gpm)	
Evacuation Method	dedicated bladder pump

Field Parameters	I	1V	2V	3V
Color				colorless
Odor				odorless
Appearance				clear
pH (s.u.)	6.62	6.08	5.81	6.01
Conductivity (~~mS/cm~~) (µmhos/cm)	120.3	120.3	120.2	118.4
Turbidity (NTU)				2.6
Temperature (°C)	18.9	17.9	17.1	18.8
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks: 5 gal pails: IIII IIII Split w/ tizm

DTW: 44.21'

Constituents Sampled	Container Description	Number	Preservative

Sampling Personnel:

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: GRUMMAN | Project No.: NY001321.0001.00002 | Page: 1 of 1

Site Location: Bethpage, NY | Date: 5/11/01

Site/Well No.: GM-38D2 | Replicate No.: MS/MSD | Code No.:

Weather: Sunny, 80° | Sampling Time: Begin 1025 End 1045

Evacuation Data		Field Parameters	I	1V	2V	3V
Measuring Point	TOC	Color				
MP Elevation (ft)		Odor				
Land Surface Elevation (ft)	[redacted]	Appearance				
Sounded Well Depth (ft bmp)	495.00'	pH (s.u.)	5.28	5.12	5.16	5.06
Depth to Water (ft bmp)	472.00'	Conductivity ~~(mS/cm)~~	101.7	101.8	101.8	103.1
Water-Level Elevation (ft)		(µmhos/cm)				
Water Column in Well (ft)	23.00'	Turbidity (NTU)				2.4
Casing Diameter/Type	4" (.65)	Temperature (°C)	15.5	15.1	17.0	15.6
Gallons in Well	14.95	Dissolved Oxygen (mg/L)				
Gallons Pumped/Bailed Prior to Sampling	45.00	Salinity (%)				
~~Sample Pump Intake~~ Setting (ft bmp)	Pressure 220 PSI	Sampling Method	Pump Discharge			
Purge Time	begin 1025 end 1045	Remarks	5 Gal Pails: IIII IIII Split w/ HLM			
Pumping Rate (gpm)			DTW: 472.91'			
Evacuation Method	Dedicated bladder pump					

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: [signature]

Well Casing Volumes

Gal./Ft.			
1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NY001321.0001.00002 | Project No.: GRUMMAN | Page: 1 of 1

Site Location: Bethpage - NY | Date: 5/11/01

Site/Well No.: GM-38D | Replicate No.: Rep051101 | Code No.:

Weather: Sunny, 75° | Sampling Time: Begin 0825 End 1010

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	340.00'
Depth to Water (ft bmp)	[redacted] (317.00')
Water-Level Elevation (ft)	
Water Column in Well (ft)	23.00'
Casing Diameter/Type	4 (.65)
Gallons in Well	14.95
Gallons Pumped/Bailed Prior to Sampling	45.00
~~Sample Pump Intake~~ Packer Setting (ft bmp)	Pressure: 145 PSI
Purge Time	begin 0825 end 1010
Pumping Rate (gpm)	
Evacuation Method	Dedicated bladder pump

Field Parameters

	I	1V	2V	3V
Color				Colorless
Odor				Odorless
Appearance				Clear
pH (s.u.)	7.25	5.71	5.69	5.49
Conductivity ~~(mS/cm)~~ (µmhos/cm)	116.4	123.0	124.4	124.2
Turbidity (NTU)				3.8
Temperature (°C)	15.6	14.6	15.8	14.9
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump Discharge

Remarks: 5 GAL Pails : IIII IIII

Split w/ H2M

DTW: 39.61'

Constituents Sampled	Container Description	Number	Preservative
See COC			

Sampling Personnel: K Schmitt

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No.: NY001321.0001.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 5/30/01

Site/Well No.: 21S | Replicate No.: | Code No.:

Weather: Sunny, 65° | Sampling Time: Begin 1200 End:

Evacuation Data

Measuring Point	Toc
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	67.00'
Depth to Water (ft bmp)	33.96'
Water-Level Elevation (ft)	
Water Column in Well (ft)	33.04'
Casing Diameter/Type	2" (.16)
Gallons in Well	5.29
Gallons Pumped/Bailed Prior to Sampling	15.86
Sample Pump Intake Setting (ft bmp)	65'
Purge Time	begin 1209 end 1220
Pumping Rate (gpm)	1 gpm (1V = 6 minutes)
Evacuation Method	Submersible pump

Field Parameters

	I	1V	2V	3V
Color		colorless		
Odor		none		
Appearance		clear		
pH (s.u.)	9.68	9.49	9.37	9.43
Conductivity (mS/cm)				
(µmhos/cm)	123	121	118	70
Turbidity (NTU)				7.90
Temperature (°C)	17.1	17.0	16.9	17.0
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks: DTW = 33.96'

Constituents Sampled	Container Description	Number	Preservative
Check Box			

Sampling Personnel:

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY000321.0001.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 5/30/01

Site/Well No.: 21 I | Replicate No.: | Code No.:

Weather: Partly Cloudy, 60° | Sampling Time: Begin 0945 End 1050

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	140.00'
Depth to Water (ft bmp)	129.00'
Water-Level Elevation (ft)	
Water Column in Well (ft)	11.00'
Casing Diameter/Type	4" (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
~~Sample Pump Intake~~ packer Setting (ft bmp) pressure	90 PSI
Purge Time	begin 0945 end 1050
Pumping Rate (gpm)	350 ml/minute
Evacuation Method	Bladder (3 well volumes)

Field Parameters

	I	1V	2V	3V
Color		Colorless		
Odor			none	
Appearance			Clear	
pH (s.u.)	8.68	9.67	10.40	10.42
Conductivity (mS/cm)				
(µmhos/cm)	322	184	174	175
Turbidity (NTU)	Visually less than 50			
Temperature (°C)	14.6	14.2	14.4	13.3
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks: DTW = 35.20'

Constituents Sampled	Container Description	Number	Preservative
Check COC			

Sampling Personnel:

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Milligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: Northrop Grumman | Project No. NY001321.0001.00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 5/30/01

Site/Well No.: 18 S | Replicate No.: | Code No.:

Weather: Sunny, Cool, 65° | Sampling Time: Begin 1405 | End 1420

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	65.75'
Depth to Water (ft bmp)	42.59'
Water-Level Elevation (ft)	
Water Column in Well (ft)	23.16'
Casing Diameter/Type	2" (.16)
Gallons in Well	3.71
Gallons Pumped/Bailed Prior to Sampling	11.12
Sample Pump Intake Setting (ft bmp)	65'
Purge Time	begin 1405 end 1420
Pumping Rate (gpm)	Q = 3/4 gallon
Evacuation Method	Submersible pump (1V ≈ 5 mins)

Field Parameters

	I	1V	2V	3V
Color			colorless	
Odor			odorless	
Appearance			clear	
pH (s.u.)	8.91	7.83	7.55	7.25
Conductivity (mS/cm)				
(µmhos/cm)	146.1	142.3	135.3	139.0
Turbidity (NTU)				8.65
Temperature (°C)	18	17.4	17.5	17.4
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: pump discharge.

Remarks:

Constituents Sampled	Container Description	Number	Preservative
Check COC			

Sampling Personnel:

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001227.0001 Task: 00002 Well ID: HN-29I

Date: 5/31/01 Sampled By: KS/GW

Sampling Time: 1150 Recorded By: KS

Weather: Sunny, Cool, 65° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow (Minipulse)

Casing Diameter: 4" Purge Rate: 450 ml/min

Total Depth: 130' Total Volume Purged: 11.5 GALLONS

Depth to Water: 49.10' Pump Intake Depth: 125'

Water Column: 80.90' Pump on: 1200 Off: 1305

Gallons/Foot: Parameters Sampled: check COC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1205	~450			+142	7.01	312	17.43	49.10'	11.48	
1210				+117	7.48	310.9	17.92	—	9.86	
1215				+113	7.55	310.2	17.67	—	9.99	
1220				+110	7.64	308.5	18.08	51.08'	10.15	
1225				+109	7.69	306.6	18.20	—	10.15	
1230				+108	7.74	303.4	18.66	—	10.21	
1235				+106	7.77	298.9	18.57	50.82'	10.22	
1240				+105	7.81	293.6	18.83	—	10.20	
1245				+105	7.82	287.8	19.21	—	10.11	
~~1250~~			14.8	+104	7.87	278.3	19.20		10.18	
1255								—		
~~1300~~								—		
~~1305~~	↓									

Well Secure: Yes Purge Water Disposal:

Color: Colorless Turbidity(qualitative): Clear

Colorless

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: HN-29D
Date: 5/31/01 Sampled By: KS/GW
Sampling Time: 1315 Recorded By: KS
Weather: Sunny, cool, 65° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder
Casing Diameter: 4" Purge Rate: 450 ml/min
Total Depth: 220' Total Volume Purged: 7 GALLONS
Depth to Water: 49.66' Pump Intake Depth: 215'
Water Column: 170.34' Pump on: 1350 Off: 1500
Gallons/Foot: Parameters Sampled: check COC
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
~~1405~~	450			+162	6.74	113.4	18.28	49.66'	10.01	
1410	↓			+154	6.88	120.8	18.52	–	10.21	
1415				+156	6.91	113.0	18.84	–	10.51	
1420				+151	6.97	112.6	19.05	49.66'	10.73	
1425				+148	7.03	112.5	18.94	–	10.80	
1430				+145	7.10	112.3	18.75	–	10.96	
1435				+144	7.14	112.1	18.82	49.71'	10.89	
1440				+142	7.17	111.8	18.65	–	10.86	
1445				+140	7.20	110.7	18.78	–	10.97	
1450				+136	7.22	110.0	18.77	49.66'	11.05	
~~1455~~			15.56					–		
~~1500~~		7GAL						–		
~~1505~~	↓									

Well Secure: Yes Purge Water Disposal:
Color: colorless Turbidity(qualitative): clear
odorless

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0002 Task: 00002 Well ID: HN-24I
Date: 5/31/01 Sampled By: KS/GW
Sampling Time: 0800 Recorded By: KS
Weather: Sunny, 65° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Micropurge Low Flow
Casing Diameter: 4" Purge Rate: 400 mL/min
Total Depth: 158' Total Volume Purged: 11.5 GALLONS
Depth to Water: 58.65' Pump Intake Depth: 153'
Water Column: 102.31' Pump on: 0805 Off: 0925
Gallons/Foot: Parameters Sampled: check COC
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
0815	~400			+227	4.20	231	14.4	58.65'	5.06	
0820	↓			+225	4.18	227.6	14.4	-	4.84	
0825				+226	4.13	222	14.3	-	4.60	
0830				+227	4.00	210.6	14.9	58.88'	4.45	
0835				+240	3.78	197.8	15.15	-	4.31	
0840				+251	3.64	192.3	15.27	-	4.28	
0845				+259	3.56	190.0	15.36	58.85	4.24	
0850				+263	3.53	188.0	15.33	-	4.21	
0855				+268	3.48	186.5	15.49	-	4.17	
0900				+273	3.44	184.9	15.58	58.84'	4.17	
0905				+277	3.40	182.9	15.46	-	4.14	
0910				+280	3.37	182.3	15.50	-	4.14	
0915	↓		44.1	+283	3.35	181.2	15.59	58.84'	4.08	

Well Secure: Yes Purge Water Disposal: ~~Onsite~~ ~~Offsite~~
Color: Colorless Turbidity(qualitative): Clear
Odorless

SG:\APROJECT\Lockheed Martin\Great Neck\NY001227.0002\Data\GWsmpfrm.xls- Sheet1

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: FW-03
Date: 5/31/01 Sampled By: KS/GW
Sampling Time: 10:05 Recorded By: KS
Weather: Sunny, 65° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Micropurge
Casing Diameter: 2" Purge Rate: ~400 ml/min
Total Depth: 64' Total Volume Purged: 1.0 Gallons
Depth to Water: 58.45' Pump Intake Depth: 62'
Water Column: 5.55' Pump on: 1015 Off: 1125
Gallons/Foot: Parameters Sampled: Check COC
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water,	Diss. Oxygen	Comments
1020	~400			+259	3.82	149.3	15.97	~~58.45~~	7.92	
1025	"			+261	3.90	153.2	18.27	-	7.02	
1030	"			+263	3.81	154.8	17.90	-	7.04	
1035	"			+261	3.84	155.2	17.87	58.49'	7.16	
1040	"			+259	3.86	153.2	17.83	-	7.26	
1045	"			+260	3.88	154.2	17.83	-	7.44	
1050	"			+258	3.90	154.3	17.78	58.48'	7.50	
1055	"			+257	3.93	154.2	17.76	-	7.55	
1100	"		36	+256	3.95	154.9	17.72	-	7.61	
1105	↓		~~RM~~					58.45'		
~~1110~~	↓							-		
~~1115~~	↓							-		
1120	↓									

Well Secure: Yes Purge Water Disposal:
Color: Colorless Turbidity(qualitative): clear odorless
Odor

.SG:\APROJECT\Lockheed Martin\Great Neck\WY001227.0002\Data\GWsmpfrm.xls- Sheet1

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NY001321.0001.00002 | Project No.: Grumman | Page: 1 of 1

Site Location: Bethpage, NY | Date: 6/1/01

Site/Well No.: 37D | Replicate No.: | Code No.:

Weather: Sunny, 65° | Sampling Time: Begin 0745 End 1030

Evacuation Data		Field Parameters	I	1U	2U	3U
Measuring Point	TOC	Color		Colorless		
MP Elevation (ft)		Odor		odorless		
Land Surface Elevation (ft)		Appearance		clear		
Sounded Well Depth (ft bmp)	262'	pH (s.u.)	3.80	3.80	3.89	3.96
Depth to Water (ft bmp)	240'	Conductivity (mS/cm)				
Water-Level Elevation (ft)		(µmhos/cm)	150.7	150.1	150.4	150.6
Water Column in Well (ft)	22	Turbidity (NTU)				1.25
Casing Diameter/Type	4" (.65)	Temperature (°C)	14.64	14.52	14.61	14.66
Gallons in Well	14.30	Dissolved Oxygen (mg/L)	6.38	6.32	6.25	6.21
Gallons Pumped/Bailed Prior to Sampling	45.00	Salinity (%)				
~~Sample Pump Intake Setting (ft bmp)~~ Packer Pressure	110 PSI	Sampling Method	pump discharge			
Purge Time	begin 0745 end	Remarks	5 gal pails : [redacted] (9)			
Pumping Rate (gpm)	400 ml/min		Split w/ HZM			
Evacuation Method	Dedicated Bladder pump		DTW: 40.51'			

Constituents Sampled	Container Description	Number	Preservative
Check VOC			

Sampling Personnel: KS

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 78S

Date: 6/4/01 Sampled By: KS/GW

Sampling Time: 1440 Recorded By: KS/GW

Weather: Sunny, 70° Coded Replicate No.: [redacted]

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Submersible

Casing Diameter: 4" Purge Rate: 1gpm → Low Flow * (500 ml/min)

Total Depth: 70' Total Volume Purged:

Depth to Water: 42.57' Pump Intake Depth: 65'

Water Column: 27.43' Pump on: 1440 Off:

Gallons/Foot: Parameters Sampled: check COC

Gallons in Well: 17

* See Attached Sheet

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1505	500			282	4.69	230.3	14.84	42.57'	11.02	
1510	↓			287	4.56	288.2	18.37	-	9.47	
1515				288	4.55	224.7	18.64	-	9.52	
1520				288	4.54	222.5	18.81	42.56'	9.63	
1525			12.8	287	4.53	220.8	19.59	-	9.58	
1530				287	4.56	218.3	18.98	-	9.67	
1535			5.79	288	4.54	217.3	19.20	42.56'	9.67	
~~1540~~										

Well Secure: Yes Purge Water Disposal:

Color: colorless Turbidity(qualitative): Clear

odorless

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project	NY001321.0001.00002	Project No.	GRUMAN	Page	1 of 1
Site Location	Bethpage, NY			Date	6/4/01
Site/Well No.	78S	Replicate No.		Code No.	
Weather	Sunny, 70°	Sampling Time:	Begin 1440	End	

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	70.00'
Depth to Water (ft bmp)	42.57'
Water-Level Elevation (ft)	
Water Column in Well (ft)	27.43'
Casing Diameter/Type	4" PVC (.65)
Gallons in Well	~~54~~ 17.0
Gallons Pumped/Bailed Prior to Sampling	~~54~~
Sample Pump Intake Setting (ft bmp)	65'
Purge Time	begin 14:40 end
Pumping Rate (gpm)	~ 1 gpm → Low Flow
Evacuation Method	Submersible Pump

Field Parameters

Color	
Odor	
Appearance	
pH (s.u.)	
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
Salinity (%)	
Sampling Method	
Remarks	Pumped at 1 gpm for 1 volume to check turbidity then switch to low flow

Constituents Sampled	Container Description	Number	Preservative
Check COC			

Sampling Personnel: KS / GW

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: A4001321.0001 Task: 00002 Well ID: 78 I

Date: 6/4/01 Sampled By: KS/GW

Sampling Time: 0400 Recorded By: KS

Weather: Sunny, 75° Coded Replicate No.: Rep 2M

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Submersible

Casing Diameter: 4" Purge Rate: 500 ml/min

Total Depth: 110' Total Volume Purged:

Depth to Water: 42.81' Pump Intake Depth: 100'

Water Column: 67.19' Pump on: 1600 Off:

Gallons/Foot: Parameters Sampled: Check COC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
0405			4.31	272	4.66	283.7	18.57	42.81'	10.13	
0410				282	4.60	309.6	18.01	-	10.28	
0415				285	4.60	313.3	17.92	-	10.24	
0420				286	4.59	315.9	17.83	42.83'	10.27	
0425			3.50	287	4.60	316.9	17.59	-	10.39	
0430				287	4.59	319.0	17.32	-	10.40	
0435			2	286	4.57	319.0	17.34		10.40	
0440			2.95	288	4.58	319.7	17.26	-	10.42	
445			2.72					-		
~~450~~										
~~455~~								-		
~~500~~								-		
~~505~~										

Well Secure: Yes Purge Water Disposal:

Color: Turbidity(qualitative):

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NY001321.0001.00002 | Project No.: GRUMMAN | Page: 1 of 1

Site Location: Bethpage, NY | Date: 6/4/01

Site/Well No.: 18I | Replicate No.: | Code No.:

Weather: Sunny, 70° | Sampling Time: Begin 1105 End:

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	105'
Depth to Water (ft bmp)	94'
Water-Level Elevation (ft)	
Water Column in Well (ft)	11'
Casing Diameter/Type	4 (.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
~~Sample Pump Intake Setting (ft bmp)~~ Packer Pressure	90 PSI
Purge Time	begin 1105 end
Pumping Rate (gpm)	
Evacuation Method	dedicated bladder

Field Parameters

	I	IV	2V	3V
Color		colorless		
Odor		odorless		
Appearance		clear		
pH (s.u.)	4.61	4.47	4.51	4.45
Conductivity (mS/cm)	75.9	74.2	73.7	73.6
(µmhos/cm)				
Turbidity (NTU)				4.31
Temperature (°C)	15.86	15.86	15.78	15.66
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks: 5 gal pails: 1 1 1 1/2 (4.5)

DTW: 43.68'

Constituents Sampled	Container Description	Number	Preservative
Check COC			

Sampling Personnel: KS

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 18D

Date: 6/4/01 Sampled By: KS/GW

Sampling Time: 0900 Recorded By: KS

Weather: Sunny, 65° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder

Casing Diameter: 4" Purge Rate:

Total Depth: 300' Total Volume Purged:

Depth to Water: 46.80' Pump Intake Depth: 295'

Water Column: 253.20' Pump on: 0905 Off: 1035

Gallons/Foot: Parameters Sampled: Check CoC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
0910				212	5.36	64.3	18.58	46.80'	8.07	
0915				238	4.72	64.6	17.12	–	7.86	
0920				221	4.66	112.6	18.57	–	8.60	
0925				186	4.74	118.1	19.17	46.80'	8.79	
0930				171	4.77	113.7	19.51	–	8.77	
0935				180	4.73	112.0	19.46	–	8.92	
0940				198	4.68	109.9	19.53	46.80'	9.06	
0945				212	4.60	107.7	19.50	–	9.21	
0950				221	4.61	106.4	19.56	–	9.19	
0955				233	4.57	104.3	19.80	46.80'	9.26	
1000				236	4.54	101.8	19.76	–	9.27	
1005				245	4.54	98.0	19.73	–	9.38	
1010				252	4.52	95.7	19.44	46.80'	9.45	
1015				257	4.51	94.1	19.04	–	9.52	
1020				260	4.48	92.7	19.06	–	9.65	
1025				261	4.50	91.8	19.07	46.80'	9.66	
1030			267	263	4.51	90.3	19.18	–	9.64	

Well Secure: Yes Purge Water Disposal:

Color: Turbidity(qualitative): 267 (very cloudy)

Not required below 50 NTUs (VOCs only; no metals)

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 74I

Date: 6/5/01 Sampled By: KS/GW

Sampling Time: 0855 Recorded By: KS

Weather: Sunny, 70° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Submersible

Casing Diameter: 4" Purge Rate: 400 ml/min

Total Depth: 114' Total Volume Purged: 10 GALLONS

Depth to Water: 37.41' Pump Intake Depth: 104'

Water Column: 76.59 Pump on: 0855 Off: 1000

Gallons/Foot: Parameters Sampled: Check COC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
0900	400		83.4	236	4.81	67.7	14.75	37.41'	12.15	
0905	↓			254	4.63	67.6	15.06	-	12.26	
0910			58.9	255	4.65	67.5	14.96	-	12.41	
0915				256	4.66	67.4	15.03	37.41'	12.49	
0920			30.5	258	4.68	67.4	14.84	-	12.52	
0925				260	4.70	67.4	14.74	-	12.55	
0930				261	4.71	67.4	14.76	37.41'	12.56	
0935			23.9	262	4.71	67.4	14.81	-	12.60	
0940				263	4.71	67.4	14.87	-	12.63	
0945				264	4.71	67.4	15.00	37.43'	12.68	
0950				264	4.72	67.4	15.05	-	12.71	
0955	↓		8.38	265	4.72	67.3	15.05	-	12.74	
~~0000~~										

Well Secure: Yes

Color: Colorless

Purge Water Disposal:

Turbidity(qualitative): Clear

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0004 Task: 00002 Well ID: MW-74D2

Date: 6/5/01 Sampled By: KS/GW

Sampling Time: 1150 Recorded By: KS

Weather: Sunny, 75° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder

Casing Diameter: 4" Purge Rate: 450 ml/min

Total Depth: 562' Total Volume Purged: 12 GALLONS

Depth to Water: 57.40' Pump Intake Depth: 552'

Water Column: Pump on: 1150 Off: 1315

Gallons/Foot: Parameters Sampled: Check COC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1155	450			333	4.40	33.2	15.83	57.40'	6.55	
1200	↓			341	4.07	32.1	15.50	—	4.48	
1205				347	4.00	32.3	15.68	—	3.67	
1210				349	4.02	32.6	15.55	57.40'	3.41	
1215				347	4.04	32.8	15.43	—	3.10	
1220				328	4.08	31.9	15.38	—	3.04	
1225				251	4.33	34.1	15.50	57.40'	3.34	
1230				257	4.32	35.1	15.53	—	4.14	
1235				277	4.22	34.6	15.35	—	4.63	
1240				286	4.17	34.4	15.31	57.40'	4.66	
1245				292	4.14	34.3	15.26	—	4.52	
1250				296	4.21	34.4	15.40	—	4.41	
1255				295	4.20	34.2	15.38	57.40'	4.27	
1300				297	4.19	34.2	15.35	—	4.14	
1305				298	4.20	34.1	15.50	—	4.18	
1310	↓		7.30	300	4.17	34.2	15.53	57.40'	4.15	

Well Secure: Yes Purge Water Disposal:

Color: Colorless odorless Turbidity(qualitative): Clear

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 74D
Date: 6/5/01 Sampled By: KS/DW
Sampling Time: 1000 Recorded By: KS
Weather: Sunny, 70° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder
Casing Diameter: 4" Purge Rate: 400 ml/min
Total Depth: ~~[illegible]~~305' Total Volume Purged:
Depth to Water: 46.51' Pump Intake Depth: 300'
Water Column: 258.49' Pump on: 1000 Off: 1110
Gallons/Foot: Parameters Sampled: Check Coc
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1010								46.51'		
~~1020~~	Low Flow		Equipment	being		stood (well		purging	Stagnant water	
1015								46.51'		
1025				317	3.80	54.5	15.59	-	5.71	
1030				324	3.87	56.8	15.61	-	5.18	
1035				323	3.91	58.1	15.69	46.44'	5.44	
1040				323	3.99	59.3	15.59	-	5.71	
1045				332	4.03	59.5	15.57	-	5.79	
1050				330	4.06	59.5	15.81	46.44'	5.81	
1055				335	4.05	59.6	16.17	-	5.78	
1100				339	4.05	59.4	16.14	-	5.76	
1105			5.09	340	4.05	59.3	16.18	46.44'	5.76	

Well Secure: YES Purge Water Disposal:
Color: colorless Turbidity(qualitative) clear
odorless

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 73D2
Date: 6/5/01 Sampled By: KS/GW
Sampling Time: @ 1400 Recorded By: KS
Weather: Sunny, 75° Coded Replicate No.: Rep3

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder
Casing Diameter: 4" Purge Rate: 450 ml/min
Total Depth: 352' Total Volume Purged: 15 GALLONS
Depth to Water: 48.41' Pump Intake Depth: 342'
Water Column: 305.59' Pump on: 1400 Off: 1540
Gallons/Foot: Parameters Sampled: Chloride COC
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1405	450			265	~~4.055~~ 5.01	90.6	22.3	48.41'	6.85	
1410				270	~~4.604~~ 4.79	93.7	17.48	–	4.29	
1415				273	~~4.655~~ 4.60	93.2	17.38	–	3.24	
1420				273	~~4.650~~ 4.59	92.8	17.69	48.41'	2.93	
1425				266	4.57	92.1	17.31	–	2.57	
1430				235	4.64	90.3	17.08	–	2.40	
1435				180	4.73	90.4	17.08	48.41'	2.62	
1440				188	4.69	105.8	17.31	–	4.16	
1445				187	4.61	105.9	17.85	–	4.92	
1450				191	4.56	104.6	17.27	48.41'	5.32	
1455				194	4.51	103.1	17.39	–	5.50	
1500				204	4.50	102.2	17.37	–	5.57	
1505				211	4.46	100.3	16.83	48.41'	5.68	
1510				220	4.43	98.8	16.76	–	5.42	
1515				226	4.42	97.0	17.07	–	5.10	
1520				230	4.47	95.9	16.59	48.41'	4.95	
1525	↓			235	4.40	95.8	17.28	–	4.85	
1530	↓			241	4.46	95.9	17.02	–	4.88	
1535	↓		77	241	4.41	96.1	17.44	48.41'	4.88	

Well Secure: Yes
Color: Colorless
odorless

Purge Water Disposal: Dandy
Turbidity(qualitative): 57

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project	NY001321.0001.00002	Project No.	GRUMMAN	Page	1 of 1
Site Location	Bethpage, NY			Date	6/5/01
Site/Well No.	20I	Replicate No.		Code No.	
Weather	SUNNY, 70°	Sampling Time:	Begin 1610	End	1545

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	105.00'
Depth to Water (ft bmp)	94.00
Water-Level Elevation (ft)	
Water Column in Well (ft)	11.00'
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.15
Gallons Pumped/Bailed Prior to Sampling	22
~~Sample Pump Intake~~ Packer Pressure Setting (ft bmp)	40 PSI
Purge Time	begin 1610 end 1545
Pumping Rate (gpm)	~1.5
Evacuation Method	

Field Parameters

	I	1V	2V	3V
Color		colorless		
Odor		odorless		
Appearance		cloudy (not opaque)		
pH (s.u.)	8.78	8.79	8.74	8.72
Conductivity (mS/cm)				
(µmhos/cm)	400.2	253.5	218.0	203.7
Turbidity (NTU)	?			104
Temperature (°C)	13.20	11.29	11.32	11.27
Dissolved Oxygen (mg/L)				

Salinity (%):

Sampling Method:

Remarks: 5 GAL Pails : 1111½ (4½)

DTW = 36.78'

Constituents Sampled	Container Description	Number	Preservative
check COC			

Sampling Personnel: KS/GW

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NY001321.0001.0002 | Project No.: | Page 1 of 1

Site Location: BETHPAGE NY | Date: 6-5-01

Site/Well No.: GM-20D | Replicate No.: | Code No.:

Weather: CLEAR 75° | Sampling Time: Begin 4:00 End 5:45

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	226
Depth to Water (ft bmp)	~~measured~~ 39.11 (215') Top of packer
Water-Level Elevation (ft)	
Water Column in Well (ft)	11 ft
Casing Diameter/Type	4" (0.65)
Gallons in Well	7.5
Gallons Pumped/Bailed Prior to Sampling	22
~~Sample Pump Intake~~ PACKER PRESSURE Setting (ft bmp)	@ 105 PSI
Purge Time	begin 4:08 end 5:30
~~Pumping Rate~~ (gpm)	Peristaltic Bladder
~~Evacuation Method~~ →	

Field Parameters

	1	1J	2J	3J
Color				COLORLESS
Odor				NONE
Appearance				CLEAR
pH (s.u.)	6.99	4.75	4.89	4.93
Conductivity ~~(mS/cm)~~ (µmhos/cm)	670	66.2	66.5	67.1
Turbidity (NTU)				0.01
Temperature (°C)	13.81	14.04	14.10	14.14
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks: SOIL FAILS : 1111 1/4 (4/c)

DTW 39.11'

Constituents Sampled	Container Description	Number	Preservative
Chem (OC			

Sampling Personnel: GW

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: N-10627

Date: 6/6/01 Sampled By: KS/GW

Sampling Time: 1025 Recorded By: KS

Weather: Sunny, 65° Coded Replicate No.:

WELL IMFORMATION

Casing Material: Steel Purge Method: Low Flow Bladder

Casing Diameter: 4" Purge Rate: 450 ml/min

Total Depth: 295' Total Volume Purged: 12 GALLONS

Depth to Water: 33.55' Pump Intake Depth: 292'

Water Column: 262.45' Pump on: 1030 Off: 1145

Gallons/Foot: Parameters Sampled: Creek Coe

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1035	450			-4	5.73	41.2	16.33	33.55'	1.25	
1040	↓			-112	6.49	37.6	16.39	-	0.40	
1045				-216	6.66	55.4	16.58	-	0.13	
1050				-255	6.77	57.0	16.68	36.78'	0.10	
1055				-253	6.66	58.5	17.36	-	0.09	
1100				-250	6.71	65.0	17.74	-	0.07	
1105				-262	6.63	69.6	18.26	36.05	0.07	
1110				-270	6.61	73.2	18.18	-	0.06	
1115				-273	6.64	76.9	18.30	-	0.06	
1120				-284	6.65	79.2	18.23	"	0.03	
1125				-284	6.64	78.3	18.04	-	0.04	
1130				-288	6.64	77.9	18.17	-	0.05	
1135				-288	6.63	76.7	18.25	35.77	0.03	

Well Secure: Expansion Cap

Color: black odorless

Purge Water Disposal:

Turbidity(qualitative): Very Turbid (black - wood waste)

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002 Well ID: 75D2

Date: 6/6/01 Sampled By: KS/GW

Sampling Time: 1215 Recorded By: KS

Weather: Sunny, 75° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder

Casing Diameter: 4" Purge Rate: 450 ml/min

Total Depth: 525' Total Volume Purged: 12 GALLONS

Depth to Water: 37.29' Pump Intake Depth: 515'

Water Column: 487.71' Pump on: 1210 Off: 1325

Gallons/Foot: Parameters Sampled: check COC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1220	450			+118	5.28	114.6	17.85	37.29'	5.81	
1225	↓			+218	5.56	113.5	17.26	-	5.55	
1230				+242	4.21	112.3	17.62	-	5.41	
1235				+255	4.18	110.8	17.57	37.28'	5.42	
1240				+265	4.17	108.7	17.61	-	5.38	
1245				+268	4.21	107.7	17.96	-	5.40	
1250				+268	4.19	107.9	19.52	37.25'	5.45	
1255				+280	4.25	106.9	17.30	-	5.59	
1300				+285	4.18	105.7	17.35	-	5.68	
1305				+285	4.17	106.4	17.38	37.24'	5.61	
1310				+285	4.16	107.6	17.82	-	5.54	
1315				+284	4.18	108.2	16.99	-	5.35	
1320				+289	4.19	108.3	16.94	37.21'	5.43	

Well Secure: Yes Purge Water Disposal:

Color: colorless Turbidity(qualitative): clear

colorless

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NY001321.0001 | Project No.: 00002 | Page: 1 of 1

Site Location: Bethpage NY | Date: 6/6/01

Site/Well No.: 36D | Replicate No.: MS/MSD | Code No.:

Weather: Sunny, 70° | Sampling Time: Begin 0809 | End 0940

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	214.00'
Depth to Water (ft bmp)	202.00'
Water-Level Elevation (ft)	
Water Column in Well (ft)	12.00
Casing Diameter/Type	4 (0.65)
Gallons in Well	7.80
Gallons Pumped/Bailed Prior to Sampling	24
~~Sample Pump Intake~~ Setting (ft bmp)	110 PST
Purge Time	begin 0805 end 0940
Pumping Rate (gpm)	
Evacuation Method	Bladder Pump

After Purge

Field Parameters

	I	1V	2V	3V
Color			Colorless	
Odor			Odorless	
Appearance			clear	
pH (s.u.)	4.21	4.23	4.23	4.25
Conductivity (mS/cm)				
(µmhos/cm)	71.1	71.5	71.7	71.7
Turbidity (NTU)				0.29
Temperature (°C)	14.51	14.51	14.58	14.59
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks:
- Small Bails: ~~NH~~ (5)
- DTW: 36.70'
- Split w/ Hzm

Constituents Sampled	Container Description	Number	Preservative
Check CoC			

Sampling Personnel: KS

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Low-Flow Groundwater Sampling Log

Project Number: A1Y001321.0001 Task: 00002 Well ID: 33D2

Date: 6/6/01 Sampled By: KS/GW

Sampling Time: 1405 Recorded By: KS/GW

Weather: Sunny, 70° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder

Casing Diameter: 4" Purge Rate: 500 ml/min

Total Depth: 520' Total Volume Purged:

Depth to Water: 52.01' Pump Intake Depth: 510'

Water Column: Pump on: 1410 Off:

Gallons/Foot: Parameters Sampled: CheckCOC

Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
1405	500			+212	4.95	69.8	17.32	52.01	6.67	
1420				+200	5.20	69.5	17.20	-	6.33	
1425				+191	5.30	69.7	17.22	-	6.51	
1430				+190	5.31	69.7	17.38	52.18'	6.81	
1435				-	-	-	-	-	-	
1440				+188	5.34	69.5	17.44	52.12'	7.23	
1445				+193	5.18	69.2	17.36	-	8.08	
1450				+227	4.69	68.4	17.41	-	9.03	
1455				+290	4.44	68.1	17.33	52.01	9.34	
1500				+286	4.37	68.0	17.43	-	9.33	
1505				+291	4.40	68.1	17.41	-	9.44	
1510				+290	4.40	68.1	17.30	52.01	9.40	
1515				+290	4.44	68.1	17.26	-	9.45	
1520					4.44	68.1	17.26	-	9.45	
					4.43	68.1	17.33		9.46	
	↓	12Gal	.53							

Well Secure: Yes Purge Water Disposal:

Color: COLORLESS NONE Turbidity(qualitative):

ARCADIS GERAGHTY & MILLER
Low-Flow Groundwater Sampling Log

Project Number: NY001321.0001 Task: 00002. Well ID: 13D
Date: 6/6/01 Sampled By: KS/GW
Sampling Time: 0820 Recorded By: KS
Weather: Sunny, 85° Coded Replicate No.:

WELL IMFORMATION

Casing Material: PVC Purge Method: Low Flow Bladder
Casing Diameter: 4" Purge Rate: 450 ml/min
Total Depth: 210 Total Volume Purged: 8 GALLONS
Depth to Water: ~~48.39'~~ Pump Intake Depth: 205'
Water Column: 171.62' Pump on: 0825 Off: 0930
Gallons/Foot: Parameters Sampled: check CoC
Gallons in Well:

FIELD PARAMETER MEASUREMENTS

Time	Rate ml./min)	Gallons Purged	Turbidity (NTUs)	REDOX (mV)	pH (SI Units)	Conductivity (µmhos/cm)	Temp (°C)	Depth to Water	Diss. Oxygen	Comments
0835	450			232	4.89	183.4	15.46	48.38'	1.84	
0840				260	4.66	187.1	15.59	–	0.63	
0845				279	4.59	185.7	15.64	–	0.45	
0850				288	4.61	186.3	15.69	48.39'	0.42	
0855				291	4.60	186.9	15.60	–	0.38	
0900				297	4.61	186.6	15.71	–	0.37	
0905				300	4.62	186.2	15.55	48.39'	0.37	
0910				304	4.62	186.6	15.69	–	0.38	
0915				308	4.60	186.8	15.59	–	0.36	
0920				311	4.59	185.9	15.65	48.39'	0.34	
0925			1.48	311	4.60	186.0	15.54	–	0.36	
~~0930~~								–		
~~0935~~										

Well Secure: Yes Purge Water Disposal:
Color: Colorless Turbidity(qualitative): clear
odor

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: 4400321.0001 | Project No.: 00002 | Page: 1 of 1

Site Location: Bethpage, NY | Date: 6/7/01

Site/Well No.: 3602 | Replicate No.: | Code No.:

Weather: SUNNY, 75° | Sampling Time: Begin 0950 End 1115

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	540.00'
Depth to Water (ft bmp)	518.00'
Water-Level Elevation (ft)	
Water Column in Well (ft)	22.00'
Casing Diameter/Type	4" (0.65)
Gallons in Well	14.30
Gallons Pumped/Bailed Prior to Sampling	43.00
~~Sample Pump Intake Setting (ft bmp)~~ Packer Pressure	735 PSI
Purge Time	begin 0900 end 1115
Pumping Rate (gpm)	
Evacuation Method	Dedicated Bladder Pump

Field Parameters

	I	1V	2V	3V
Color		colorless		
Odor		odorless		
Appearance		clear		
pH (s.u.)	9.18	9.18	8.55	7.88
Conductivity (mS/cm)				
(µmhos/cm)	205.9	43.3	128.6	92.1
Turbidity (NTU)				10.99
Temperature (°C)	14.01	14.44	14.34	14.28
Dissolved Oxygen (mg/L)				
Salinity (%)				

Sampling Method: Pump discharge

Remarks: 5 Gall Pails: 1111 (9)

DTW: 40.03'

Splashguard/Hose

Constituents Sampled	Container Description	Number	Preservative
Check VOC			

*Pressure in discharge; be careful and adjust throttle slowly between 25 + 30 PSI (this should work).

Sampling Personnel: KS

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project: NY001321.0001 | Project No. 00002 | Page 1 of 1

Site Location: Bethpage, NY | Date: 6/7/01

Site/Well No.: 35-DZ | Replicate No. | Code No.

Weather: Sunny, 75° | Sampling Time: Begin 1230 End 1425

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	530.00'
Depth to Water (ft bmp)	507.00'
Water-Level Elevation (ft)	
Water Column in Well (ft)	23.00
Casing Diameter/Type	4" (0.65)
Gallons in Well	14.95
Gallons Pumped/Bailed Prior to Sampling	45
~~Sample Pump Intake Setting (ft bmp)~~ Packer Pressure	225 PSI
Purge Time	begin 1235 end 1425
Pumping Rate (gpm)	
Evacuation Method	Dedicated bladder pump

Field Parameters

	I	IV	2V	3V
Color			colorless	
Odor			odorless	
Appearance			clear	
pH (s.u.)	5.65	4.37	4.25	4.18
Conductivity (mS/cm)				
(µmhos/cm)	72.1	85.7	85.0	84.9
Turbidity (NTU)				0.50
Temperature (°C)	16.58	16.59	16.41	16.42
Dissolved Oxygen (mg/L)				
Salinity (%)				
Sampling Method				

Remarks: 5 GALL Pails: 1111(9)

Split w/ H2M

DTW: 41.72'

Constituents Sampled	Container Description	Number	Preservative
Check COC			

Sampling Personnel: KS

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS GERAGHTY & MILLER

Water Sampling Log

Project	NY001321.0001.00002	Project No.	GRundtad	Page	1 of 1
Site Location	Bethpage, NY			Date	6/30/01
Site/Well No.	37-D2	Replicate No.		Code No.	
Weather	Sunny, 70°	Sampling Time: Begin	1040	End	1330

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	390.00'
Depth to Water (ft bmp)	367.60'
Water-Level Elevation (ft)	
Water Column in Well (ft)	23.00'
Casing Diameter/Type	4" (65)
Gallons in Well	14.95
Gallons Pumped/Bailed Prior to Sampling	45
~~Sample Pump Intake~~ Packer Pressure Setting (ft bmp)	180 PSI
Purge Time	begin 1040 end
Pumping Rate (gpm)	
Evacuation Method	Dedicated bladder pump

Field Parameters

	I	1V	2V	3V
Color		colorless		
Odor		odorless		
Appearance		clear		
pH (s.u.)	4.09	4.05	4.01	4.01
Conductivity (mS/cm)				
(µmhos/cm)	167.7	162.4	161.0	160.2
Turbidity (NTU)				1.37
Temperature (°C)	15.00	14.69	14.64	14.72
Dissolved Oxygen (mg/L)	3.54	4.27	4.64	4.66
Salinity (%)				
Sampling Method	pump discharge			

Remarks

5 gal pails: IIII IIII (9)
Split w/ H2M
DTW: 41.59'

Constituents Sampled	Container Description	Number	Preservative
check Toc			

Sampling Personnel: KS

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

Appendix C

Chain Of Custody Records

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001321.0001.00002 / Plumbum

Project Location Bethpage, NY

Laboratory STL-CT

Project Manager Carlo SANGIOVANNI

Sampler(s)/Affiliation KS/AFM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOC (40 ml vial)						Remarks	Total
TB053101	L	5/31/01		2							2
FB053101	L	"		2							2
HN-24I	L	"		2							2
HN-29I	L	"		2							2
HN-29D	L	"		2							2
FW-03	L	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 12

Relinquished by: [signature]	Organization: ARCADIS G&M	Date 5/31/01	Time _____	Seal Intact? (Yes) No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: * Report to Dave Stein *

Delivery Method: ☐ In Person ☒ Common Carrier Fed. Ex ☐ Lab Courier ☐ Other _____

SPECIFY

SPECIFY

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY000321.0001.00002 / Grumman

Project Location Bethpage, NY

Laboratory STL - CT

Project Manager Carlo SANGIOVANNI

Sampler(s)/Affiliation KS / AECOM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOC (40ml VOA)						Remarks	Total
TB053001	L	5/30/01		2							2
FB053001	L			2							2
21I	L			2							2
21S	L			2							2
18S	L			2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 10

Relinquished by: [signature]	Organization: ARCADIS G&M	Date 5/30/01	Time 9:15	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A

Special Instructions/Remarks: * Report to Dave Stern *

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001321.0001.00002

Project Location Bruman: Patchogue, NY

Laboratory HZM Group

Project Manager C/o Sam Guanni

Sampler(s)/Affiliation KS / AEM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 502.2 VOC (40 mL vials) Full list required						Remarks	Total
380	L	5/11/01		2							2
3802	L	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 4

					Seal Intact?
Relinquished by: Chris Schmitt	Organization: ARCADIS G&M	Date 5/11/01	Time		
Received by: [illegible]	Organization: UPS	Date 5/11/01	Time		Yes No N/A
Relinquished by:	Organization:	Date / /	Time		Seal Intact?
Received by:	Organization:	Date / /	Time		Yes No N/A

Special Instructions/Remarks: Report to Dave Stein (631-249-7600)

Delivery Method: ☒ In Person ☐ Common Carrier _____ (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001321.0001.00002

Project Location Grumman, Bethpage, NY

Laboratory STL-CT

Project Manager CARLO SAN GIOVANNI

Sampler(s)/Affiliation MS / AKM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOC (40ml Vial)						Remarks	Total
TE05I101	L	5/11/01		2							2
32D	L	"		2							2
3902*	L	"		6							6
RE05I101	L	"		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 12

Relinquished by: Mike Shirk	Organization: ARCADIS G&M	Date 5/11/01	Time @ 1400	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes No	N/A

Special Instructions/Remarks: * Report To Dave Stern

* Please use this sample for an MS/MSD QA/QC Sample

Delivery Method: ☐ In Person ☒ Common Carrier Fed-Ex ☐ Lab Courier ☐ Other _____

SPECIFY SPECIFY

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001371.0001.0002

Project Location GRUMMAN : Bethpage, NY

Laboratory HZM GROUP

Project Manager CARLO SAN GIOVANNI

Sampler(s)/Affiliation K. LAGAN

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 502.2 VOC (40 ML VIALS) HCL PRESERVED						Remarks	Total
7102	L	5/10/01	-	2							2
7002	L	↓	-	2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 4

				Seal Intact?
Relinquished by: A. Schmidt	Organization: ARCADIS G&M	Date 5/10/01	Time 1610	
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A

Special Instructions/Remarks: Report to Dave Stern. (631-249-7600)

Delivery Method: ☒ In Person ☐ Common Carrier _____ (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001321.0001.00002

Project Location Grumman : Bethpage, NY

Laboratory STL - CT

Project Manager Carlo DeFrancesco

Sampler(s)/Affiliation JF/KM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOC (40mL Vial)						Remarks	Total
TB051001	L	5/10/01	-	2							2
71D2	L	↓	-	2							2
70D2	L	↓	-	2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 6

					Seal Intact?
Relinquished by: [signature]	Organization: ARCADIS G&M	Date 5/10/01	Time 1630		
Received by: _____	Organization: _____	Date / /	Time _____		Yes No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____		Seal Intact?
Received by: _____	Organization: _____	Date / /	Time _____		Yes No N/A

Special Instructions/Remarks: Report To Dave Stelz

Delivery Method: ☐ In Person ☒ Common Carrier FDX SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-0597

ARCADIS GERAGHTY&MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page _____ of _____

Project Number/Name N4001321.0001.00002

Project Location BETHPAGE NY

Laboratory SEVERN TRENT SHELTON

Project Manager CARLO SALVATORE

Sampler(s)/Affiliation G.W. MS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 4 VOA VOC	1 Liter Amber (HNO3)					Remarks	Total
MW-32	L	5-08-01		6	1						7
N-10631				2	1						3
GM-16SR				2	1						3
FB 5-02 01				2	1						3
TB 5-08-01				2							2
REP-1				2	1						3

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 21

Relinquished by: [illegible]	Organization: ARCADIS G&M	Date 5/08/01	Time 5:30	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks:

* PLEASE USE THIS SAMPLE FOR MW MS/MSD/QA/QC SAMPLE
RESULT TO FOLLOW SOON

Delivery Method: ☐ In Person ☒ Common Carrier FED-EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page _____ of _____

Project Number/Name NY003901.0001.00002

Project Location BETHPAGE NY

Laboratory TL, CT

Project Manager DAVID STERN

Sampler(s)/Affiliation MS, KS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 1 LIQUID VOA	2 LIQUID VOA (UNP)	3	4	5	6	7	Remarks	Total
TB050701	L	05/07/01		2								2
FB050701				2								2
MW-10(34				2								2
TRIP				2								2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 8

Relinquished by: Michael Jaworski	Organization: ARCADIS G&M	Date 5/7/01	Time 17:00	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: COPY TO DAVID STERN

Delivery Method: ☐ In Person ☒ Common Carrier FED EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page ____ of ____

Project Number/Name NY001321.0001.00003

Project Location BETHPAGE NY

Laboratory STL CT

Project Manager DAVID STERN

Sampler(s)/Affiliation KS, KS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml VIAL (8260)	1 LITER (AMBER) GLASS (8270)	500 ML - 6 OZ (WM)				Remarks	Total
MW	L	10/6/01		2	2						4
MW-07-01	L	10/6/01		2	2						4
										Total No. of Bottles/ Containers	8

Sample Matrix: L = Liquid; S = Solid; A = Air

Relinquished by: Allison Jourdan	Organization: EARTH GEM	Date 10/6/01	Time 17:00	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A	

Special Instructions/Remarks: REPORT TO DAVID STERN

Delivery Method: ☐ In Person ☒ Common Carrier FED EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001321.0001.00002

Project Location BETHPAGE NY

Laboratory TL, CT

Project Manager DAVID STERN

Sampler(s)/Affiliation MS, KS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml VIAL VOC (UNP)						Remarks	Total
FB050401	L	05/04/01		2							2
TP050401				2							2
HN-40S				2							2
HN-40I				2							2
HN-41S				2							2
HN-41I	↓	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 12

Relinquished by: Myron J. Jamieson	Organization: ARCADIS G+M	Date 05/04/01	Time 17:00	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A

Special Instructions/Remarks: COPIES TO DAVID STERN

Delivery Method: ☐ In Person ☒ Common Carrier FED EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page _____ of _____

Project Number/Name M00321.0001.00002

Project Location Rumpus, NY

Laboratory STL

Project Manager David Stelz

Sampler(s)/Affiliation SH/MS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ML VOA VIAL VOC						Remarks	Total
29D	L	7/3/01		2							2
30D				2							2
34D2				2							2
FB 7/3/01				2							2
TB 7/3/01				2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 10

Relinquished by: [illegible]	Organization: Arcadis G&M	Date 7/5/01	Time 1700	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date __/__/__	Time _____	
Relinquished by: _____	Organization: _____	Date __/__/__	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date __/__/__	Time _____	

Special Instructions/Remarks: _____

Delivery Method: ☐ In Person ☒ Common Carrier FED EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name 30013121.0001.00001

Project Location Bellevue, NE

Laboratory STL-CT

Project Manager Paul Stein

Sampler(s)/Affiliation KC/CL

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40ml VOA Vial (HCl)						Remarks	Total
TB070201	L	7/13/01		2							2
EB070201	L			2							2
15	L			2							2
16B	L			2							2
16I	L			2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 10

Relinquished by: [signature]	Organization: ARCADIS G&M	Date 07/01/01	Time 1700	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: Report to David Stein

Delivery Method: ☐ In Person ☒ Common Carrier FedEx (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name: NY003601.0001.00009

Project Location: CLIFTON PARK NY

Laboratory: SEVERN TRENT LABS, CT

Project Manager: DAVID STERN

Sampler(s)/Affiliation: MS, KS

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml VOA (HCl)						Remarks	Total
TB050101	L	05/01/01		2							2
FB050101	L	05/01/01		2							2
MW-1	L	05/01/01		2							2
MW-2	L	05/01/01		2							2
MW-3D	L	05/01/01		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 10

Relinquished by: Michael J. Sullivan	Organization: ARCADIS G & M	Date: 5/1/01	Time: 5:00	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date: / /	Time: _____	
Relinquished by: _____	Organization: _____	Date: / /	Time: _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date: / /	Time: _____	

Special Instructions/Remarks: FAX COPY TO DAVID STERN

Delivery Method: ☐ In Person ☒ Common Carrier FED EX (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name [illegible]

Project Location [illegible]

Laboratory [illegible]

Project Manager [illegible]

Sampler(s)/Affiliation [illegible]

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE						Remarks	Total

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers

Relinquished by: [illegible]	Organization: ARCADIS G+M	Date 04/30/01	Time 5:00	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: REPORT TO DAVID STERN

Delivery Method: ☐ In Person ☑ Common Carrier FED EX ☐ Lab Courier ☐ Other _____

SPECIFY SPECIFY

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001321.0001.00002 / Hammond

Project Location Bethpage, NY

Laboratory H2M (KS)

Project Manager Carlo San Giovani

Sampler(s)/Affiliation KS / AGM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	40 ml VOC (502.2) (HCl preserved)	ANALYSIS / METHOD / SIZE					Remarks	Total
36D	L	6/7/01		2							2
36D2	L	↓		2							2
35D2	L	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers: 6

					Seal Intact?
Relinquished by: [signature]	Organization: ARCADIS G&M	Date 6/7/01	Time _____		
Received by: [signature]	Organization: H2M (KS)	Date / /	Time _____		Yes No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____		Seal Intact?
Received by: _____	Organization: _____	Date / /	Time _____		Yes No N/A

Special Instructions/Remarks: * Report to Dave Stern

Delivery Method: ☒ In Person ☐ Common Carrier _____ (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NYo0337.0001.00002 / Human

Project Location Bethpage, NY

Laboratory STL-CT

Project Manager Carlo San Giovanni

Sampler(s)/Affiliation KS / AGM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: 40 ml VOA's VOC (UNPRESERVED)						Remarks	Total
TB060701	L	6/7/01		2							2
36D	L	↓		5 6*							6 5 (C)
36D2	L			2							2
3ED2	L	↓		2							2
Rep 4	L	6/7/01		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 15 (12)

Relinquished by: [signature]	Organization: ARCADIS G&M	Date 6/7/01	Time 4:00 pm	Seal Intact? (Yes) No N/A	
Received by: _____	Organization: _____	Date / /	Time _____		
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A	
Received by: _____	Organization: _____	Date / /	Time _____		

Special Instructions/Remarks: * please use Dample for MS/MSD

(Report To Dave Stern)

Delivery Method: ☐ In Person ☒ Common Carrier Fed-Ex (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name A1Y001321.0001.00002 / Kummin

Project Location Bellpage, NY

Laboratory STL-CT

Project Manager G. San Giovani

Sampler(s)/Affiliation KS / AEM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: # of VOA VOC (UNPRES'D)						Remarks	Total
FB060601	L	6/6/01		2							2
TB060601	L			2							2
13D	L			2							2
N-1062+	L			2							2
7=D2	L			2							2
33D2	L			2							2
20D	L			2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 14

Relinquished by: [signature]	Organization: ARCADIS FTM	Date 6/6/01	Time 1630	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: * Report to Dave Steen

Delivery Method: ☐ In Person ☒ Common Carrier Fed-Ex (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NY001371.0001.00002 / Kummitt

Project Location Pathogen, NY

Laboratory STL CT

Project Manager Carlo San Giovani

Sampler(s)/Affiliation LS/AEM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: Total VOCs (UNPRSRV)						Remarks	Total
TB060501	L	6/5/01		2							2
EB060501	L			2							2
74I	L			6*							6
74D	L			2							2
74D2	L			2							2
73D2	L			2							2
KGP3	L			2							2
20I	L			2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 20

Relinquished by: [signature]	Organization: ARCADIS G&M	Date 6/5/01	Time 05:30pm	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	

Special Instructions/Remarks: * Use this Sample for MS/MSD

(Weight to Dave Skov)

Delivery Method: ☐ In Person ☐ Common Carrier Fed Ex ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name NYON1221.0001.00002 / Remedial

Project Location Lehigh, NY

Laboratory STL-CT

Project Manager Carl Stivanini

Sampler(s)/Affiliation KS/MEM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOC (CT List) (VOA)	Co/Cr (Metals) (Total/Diss)					Remarks	Total
TB060401				2							2
FB060401				2							2
18I				2							2
18D				2							2
73S				2	1						3 (KS)
73I				2	1						3 (KS)
Rep2M					1						1
FBM060401					1						1

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers 16 (KS)

Relinquished by: K Schmidt	Organization: ARCADIS G&M	Date 06/01/01	Time 0530	Seal Intact?
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?
Received by: _____	Organization: _____	Date / /	Time _____	Yes No N/A

Special Instructions/Remarks: Report to Dave Stivanini

Delivery Method: ☐ In Person ☒ Common Carrier Fed-Ex ☐ Lab Courier ☐ Other _____

SPECIFY SPECIFY

AC 05 0507

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name Mobil.0001.00002 / Brannan

Project Location Bethpage, NY

Laboratory H2M Group

Project Manager Carlo San Giuliano

Sampler(s)/Affiliation LS/AGM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	8021 Volatiles + MTBE						Remarks	Total
				ANALYSIS / METHOD / SIZE							
37D	L	6/1/01		2							2
37D2	L	"		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 4

Relinquished by: Lou Lebed	Organization: ARCADIS G+M	Date 6/1/01	Time 14:45	Seal Intact?	
Received by: _____	Organization: H2M	Date / /	Time	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A

Special Instructions/Remarks:

4 Report to Dave Stern

Delivery Method: ☒ In Person ☐ Common Carrier _____ SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-0597

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number/Name AY001321.0001.00002 / Remedial

Project Location Bethpage, NY

Laboratory STL-CT

Project Manager Carlo Sangiovanni

Sampler(s)/Affiliation KS/AGM

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: VOC (40 ml Vial)						Remarks	Total
TB060101	L	6/1/01		2							2
37D	L	↓		2							2
37D2	L	↓		2							2

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 6

Relinquished by: [signature]	Organization: ARCADIS G&M	Date 6/01/01	Time 1455	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time _____	Yes	No N/A

Special Instructions/Remarks: Report to Dave Olsen

Delivery Method: ☐ In Person ☒ Common Carrier FED. EX SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-0597

ARCADIS

Appendix D

Data Validation Memoranda

MEMO

ARCADIS G & M, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249-7600
Fax 631 249-7610

ENVIRONMENTAL

To:
David Stern

Copies:

From:
Donna M. Brown and Danielle Petkus

Date:
30 July 2001

Subject:
Data Validation of Volatile Organic Compound Groundwater Samples Collected for the Second Quarter 2001 Monitoring Program, Northrop Grumman, Bethpage, New York (Project No. NY001321.00001.00004).

DATA VALIDATION

Sixty groundwater samples, five field replicates, twelve field blanks, and seventeen trip blanks were collected from April 30 through June 21, 2001 in the vicinity of the Northrop Grumman site, Bethpage, New York. The samples were sent to Severn Trent Laboratories (STL) in Shelton, Connecticut for the analysis of volatile organic compounds (VOCs) following purge and trap GC/MS using New York State Department of Environmental Conservation (NYSDEC) 10/95 Method NYDEC 95-1 except for sample 14 which was done according to United States Environmenal Protection Agency method 624.

Validation of the data was performed following the quality assurance/quality control (QA/QC) criteria set forth in the method, and the document "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" dated October 1999. Sample identification, collection dates, and laboratory-received dates are listed in Table 1. The quality of the data was acceptable with the appropriate qualifications described in this memorandum. Metals data and semi-volatile data were discussed in a separate memo.

The laboratory provided seven data packages. The analytical data for samples were provided by the laboratory in sample delivery groups SDG 7001-1058A, 7001-1058B, 7001-

1058C, 7001-1345A, 7001-1345B, 7001-1345C, and 7001-1612A . The data validation results for these SDGs are discussed separately below.

SDG 7001-1058A

I. HOLDING TIMES

All samples were analyzed within holding time requirements.

II. GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

III. INITIAL CALIBRATION

One initial calibration was performed on May 6, 2001. The form VI photocopy was of poor quality and a faxed copy was inserted into the sample package. All compound relative response factors (RRFs) found to be >0.05. The following compound percent relative standard deviation (%RSD) was found to be >30%:

Calibration date:05/06/01

Compound	%RSD
Acetone	35.0

Associated samples: All samples.

Based on the initial calibration data, acetone sample data was qualified as estimated (J) if detected in all samples.

IV. CONTINUING CALIBRATION

Three continuing calibrations were performed on May 6 and 7, 2001. The compounds had RRFs >0.05 and percent differences (%Ds) <25% except chloromethane and chloroethane. Chloromethane was qualified as estimated (J) if detected and estimated (UJ) if not detected in samples FB043001, TB043001, TB050101, FB050101, 15D, 15D2, 16I, 15I, 17D, 15S, 17SR, 17I, 79D, 34D, and 34D2. Chloroethane was qualified as estimated (J) if detected and estimated (UJ) if not detected in samples FB043001, TB043001, TB050101, FB050101, 15D, 15D2, 16I, 15I, 17D, 15S, 17SR, 17I, 79D, 34D, 34D2, FB050201, and FB050301.

V. BLANKS

Three method blanks (VBLKLL, VBLKLH, and VBLKLI) were analyzed with this SDG. The following compounds and/or tentatively identified compound (TIC) were detected in the method blanks:

Method Blank VBLKLL

Compound	Concentration in micrograms per liter (ug/L)
Methylene chloride	1 J
Acetone	10
Tetrachloroethene	0.4 J

TIC	Retention Time (RT)
Butylated hydroxytoluene	18.73

Associated samples: TB050201 and TB050301.

Method Blank VBLKLH

Compound	Concentration in ug/L
Methylene chloride	0.7 J
Acetone	5 J

TIC	RT
Butylated hydroxytoluene	18.89

Associated samples: FB043001, TB043001, 15D, 15D2, TB050101, FB050101, 16I, 15I, 17D, 15S, 17SR, 17I, 79D, 34D, and 34D2.

Method Blank VBLKLI

Compound	Concentration in ug/L
Methylene chloride	0.6 J

TIC	RT
Butylated hydroxytoluene	17.92

Associated samples: FB050201 and FB050301.

Four trip blanks were analyzed with this SDG. The following target compounds were detected in the trip blanks:

Trip Blank TB043001

Compound	Concentration in ug/L
Methylene chloride	2 JB
Acetone	4 JB
2-Butanone	2 J

Associated samples: FB043001, 15D, and 15D2.

Trip Blank TB050101

Compound	Concentration in ug/L
Methylene chloride	1 JB

Associated samples: 16I, 15I, 17D and FB050101.

Trip Blank TB050201

Compound	Concentration in ug/L
Methylene chloride	2 JB
2-Butanone	2 J

Associated samples: 15S, 17SR, 17I, and FB050201.

Trip Blank TB050301

Compound	Concentration in ug/L
Methylene chloride	2 JB
2-Butanone	2 J

Associated samples: 79D, 34D, 34D2 and FB050301.

Four field blanks were analyzed with this SDG. The following target compounds and/or TIC were detected in the field blanks:

Field Blank FB043001

Compound	Concentration in ug/L
Methylene chloride	2 JB
Acetone	5 JB
2-Butanone	2 J

Associated samples: TB043001, 15D, and 15D2.

Field Blank FB050101

Compound	Concentration in ug/L
Methylene chloride	2 JB

Associated samples: 16I, 15I, 17D and TB050101.

Field Blank FB050201

Compound	Concentration in ug/L
Methylene chloride	2 JB
Acetone	9 J
Chloroform	0.4 J

TIC	RT
Butylated hydroxytoluene	17.97

Associated samples: 15S, 17SR, 17I, and TB050201.

Field Blank FB050301

Compound	Concentration in ug/L
Methylene chloride	2 JB
Acetone	2 J

Associated samples: 79D, 34D, 34D2 and TB050301.

Based on the blank results, the following sample results were qualified as non-detect (U) at the method detection limits or non-detect (U), if above the detection limits:

Compound	Samples
Methylene chloride	15D, 15D2, 16I, 15I, 17D, 15S, 17SR, 17I, 34D, and 34D2
Acetone	17D, 17SR, and 34D2
2-Butanone	17SR, 15S, 17I, 79D, 34D, and 34D2

VI. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

VII. MATRIX SPIKES/MATRIX SPIKE DUPLICATES

A batch specific spike was used for the matrix spike/matrix spike duplicate (MS/MSD) analyses and matrix spike blank (MSB). Spike recoveries and relative percent difference (RPD) values were within control limits for the MS/MSD and MSB.

VIII. INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

IX. TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly.

X. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

XI. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

Tentatively identified compounds (TICs) were detected in this sample set and were reported correctly.

XII. OVERALL ASSESSMENT OF DATA

The quality of the data presented in this SDG package is acceptable with the appropriate qualifications described above.

SDG 7001-1058B

I. HOLDING TIMES

All samples were analyzed within holding time requirements.

II. GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

III. INITIAL CALIBRATION

Three initial calibrations were performed on May 6, 10, and 11, 2001. All compound relative response factors (RRFs) were found to be >0.05. The following compound relative standard deviations (%RSDs) were found to be >30%:

Calibration date:05/06/01

Compound	%RSD
Acetone	35.0

Associated samples: HN-42S, HN-42I, HN40S, HN-40I, 79I, N-10634, FB050701, TB050701, FB050401 and TB050401.

Calibration date:05/10/01

Compound	%RSD
Bromomethane	31.0
Chloromethane	32.7

Associated sample: 14.

The above compounds were qualified as estimated (J) if detected in the associated samples.

IV. CONTINUING CALIBRATION

Four continuing calibrations were performed on May 4, 7, 8, and 10, 2001. The compounds had RRFs >0.05. The following percent differences (%Ds) were >25%:

Calibration date:05/04/01

Compound	%RSD
Vinyl acetate	-32.1

Associated samples: TB050801, TB051001, FB050801, MW-3R, N-10631, GM-16SR, REP-1, 70D2, and 71D2.

Calibration date:05/07/01

Compound	%RSD
Chloroethane	26.5

Associated samples: FB050401 and TB050401.

Calibration date:05/08/01

Compound	%RSD
Chloromethane	38.8
Vinyl chloride	28.3
Chloroethane	32.9
Carbon tetrachloride	26.8

Associated samples: HN-42S, HN-42I, HN-40S, HN-40I, 79I, N-10634, FB050701, and TB050701.

The above compounds were qualified as estimated (J) if detected and estimated (UJ) if not detected in the associated samples.

V. BLANKS

Four method blanks (VBLKLI, VBLKLV, VBLKLJ, and VBLKOX) were analyzed with the samples in this SDG. The following compounds and TIC were detected in the method blanks:

Method Blank VBLKLI

Compound	Concentration in ug/L
Methylene chloride	0.6 J

TIC	RT
Butylated hydroxytoluene	17.92

Associated samples: FB050401 and FB050401.

Method Blank VBLKLJ

Compound	Concentration in ug/L
Methylene chloride	2 J
Acetone	6 J
2-Butanone	2 J

TIC	RT
Butylated hydroxytoluene	18.82

Associated samples: HN-42S, HN-42I, HN-40S, HN-40I, 79I, N-10634, and FB050701, TB050701.

Method Blank VBLKLV

Compound	Concentration in ug/L
Methylene chloride	3 J
Acetone	3 J
2-Butanone	2 J

TIC	RT
Butylated hydroxytoluene	18.61

Associated samples: TB050801, TB051001, FB050801, MW-3R, N-10631, GM-16SR, REP-1, 70D2, and 71D2.

Method Blank VBLKOX

Compound	Concentration in ug/L
Methylene chloride	1.2

TIC	RT
Butylated hydroxytoluene	23.60

Associated sample: 14.

Four trip blanks were analyzed with this SDG. The following target compounds and TICs were detected in the trip blanks:

Trip Blank TB050401

Compound	Concentration in ug/L
Methylene chloride	1 JB

Associated samples: HN-42S, HN-42I, HN-40S, and HN-40I.

Trip Blank TB050701

Compound	Concentration in ug/L
Methylene chloride	1 JB
Acetone	2 JB

Associated samples: N-10634, 79I, and 14.

Trip Blank TB050801

Compound	Concentration in ug/L
Methylene chloride	1 JB
Acetone	2 JB
2-Butanone	2 JB

TIC	RT
Butylated hydroxytoluene	18.39

Associated samples: MW-3R, N-10631, GM-16SR, and REP-1.

Trip Blank TB051001

Compound	Concentration in ug/L
Methylene chloride	2 JB
2-Butanone	1 JB

TIC	RT
Butylated hydroxytoluene	17.86

Associated samples: 71D2 and 70D2.

Three field blanks were analyzed with this SDG. The following target compounds were detected in the field blanks:

Field Blank FB050401

Compound	Concentration in ug/L
Methylene chloride	1 JB
Acetone	2 J

Associated samples: HN-42S, HN-42I, HN-40S, and HN-40I.

Field Blank FB050701

Compound	Concentration in ug/L
Methylene chloride	1 JB
Acetone	3 JB
2-Butanone	2 JB

Associated samples: N-10634, 79I, and 14.

Field Blank FB050801

Compound	Concentration in ug/L
Bromomethane	0.5 J
Methylene chloride	1 JB
Acetone	2 JB
2-Butanone	2 JB

Associated samples: MW-3R, N-10631, GM-16SR, and REP-1.

Based on the blank results, the following sample results were qualified as non-detect (U) at the method detection limits or non-detect (U), if above the detection limits:

Compound	Samples
Methylene chloride	HN-42S, HN-42I, HN-40S, HN-40I, 79I, N-10634, MW-3R, N-10631, GM-16SR, REP-1, 71D2, and 14.
Acetone	HN-42I, 79I, MW-3R, N-10631, GM-16SR, REP-1, 71D2, and 70D2.
2-Butanone	HN-42S, N-10634, 79I, MW-3R, N-10631, GM-16SR, REP-1, 71D2, and 70D2.

VI. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks. Sample 14, done by method 624, had transcription errors on the Form II. Corrections were made on the Form II and no qualifications were necessary.

VII. MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample 71D2 was used for the MS/MSD analyses and MSB. Spike recoveries and RPD values were within control limits for the MS/MSD and MSB.

The laboratory also provided two QCS spike summaries. The percent recoveries (%R) for four compounds were outside QC limits. No qualifications were necessary.

VIII. INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

IX. TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly except for field blank FB050801. 4-Methyl-2-pentanone and toluene were reported on the Form I as detected target compounds. After reviewing the quantitation report, which they

were not listed on, and chromatogram, it has been determined that 4-methyl-2-pentanone and toluene were not detected in the field blank. 4-Methyl-2-pentanone and toluene were qualified as non-detect (U) in field blank FB050801.

X. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

XI. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

Tentatively identified compounds (TICs) were detected in this sample set and were reported correctly.

XII. OVERALL ASSESSMENT OF DATA

Sample MW-3R was replicated and labeled REP-1. The duplicate results were acceptable. The quality of the data presented in this SDG package is acceptable with the appropriate qualifications described above.

SDG 7001-1058C

I. HOLDING TIMES

All samples were analyzed within holding time requirements.

II. GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

III. INITIAL CALIBRATION

One initial calibration was performed on May 11, 2001. All compound RRFs were found to be >0.05 and all compound %RSDs were found to be <30%. No qualification of the data was necessary based on the initial calibration results.

IV. CONTINUING CALIBRATION

One continuing calibration was performed on May 15, 2001. The compounds had RRFs >0.05 and %Ds <25% except chloroethane, which had a percent difference of

25.7%. Chloroethane was qualified as estimated (J) if detected, and estimated (UJ) if not detected in all samples.

V. BLANKS

One method blank (VBLKLW) was analyzed with the samples in this SDG. The following compounds and TIC were detected in the method blank:

Method Blank VBLKLW	
Compound	Concentration in ug/L
Methylene chloride	2 J
Acetone	3 J
2-Butanone	2 J
TIC	RT
Butylated hydroxytoluene	18.68

Associated samples: All samples.

One trip blank was analyzed with this SDG. The following target compounds were detected in the trip blank:

Trip Blank TB051101	
Compound	Concentration in ug/L
Methylene chloride	1 JB
Acetone	2 JB
2-Butanone	1 JB
Trichloroethene	0.5 J

Associated samples: All samples.

Based on the blank results, methylene chloride, acetone, and 2-butanone were qualified as non-detect (U) at the method detection limits or non-detect (U), if above the detection limits in 38D, 38D2, and REP051101.

VI. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

VII. MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample 38D2 was used for the MS/MSD analyses and MSB. Two spike recoveries and a RPD values were outside control limits for the MS/MSD and MSB. No qualification of the data was necessary.

The laboratory also provided a QCS spike summary. The percent recoveries (%R) for four compounds were outside QC limits. No qualifications were necessary.

VIII. INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

IX. TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly.

X. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

XI. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

TICs were detected in this sample set and were reported correctly.

XII. OVERALL ASSESSMENT OF DATA

Sample 38D was replicated and labeled REP051101. The duplicate results were acceptable. The quality of the data presented in this SDG package is acceptable with the appropriate qualifications described above.

SDG 7001-1345A

I. HOLDING TIMES

All samples were analyzed within holding time requirements.

II. GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

III. INITIAL CALIBRATION

One initial calibration was performed on May 23, 2001. All compound RRFs found to be >0.05 and all compound %RSDs were found to be < 30%.

IV. CONTINUING CALIBRATION

Three continuing calibrations were performed on June 2, 6, and 7, 2001. The compounds had RRFs > 0.05 and %Ds <25% except for the following:

Calibration Date: 06/02/01

Compound	%D
Chloromethane	-25.8
Acetone	-50.1
2-Butanone	-27.5

Associated Samples: All except 18I, 18D, TB060401, and FB060401.

The above compounds were qualified as estimated (J) if detected and estimated (UJ) if not detected in the associated samples.

V. BLANKS

Two method blanks (VBLKM3 and VBLKM8) were analyzed with this SDG. The following compounds and TIC were detected in the method blanks:

Method Blank: VBLKM3

Compound	Concentration in ug/L
Methylene Chloride	0.4 J
Acetone	3 J

TIC	RT
Butylated hydroxytoluene	22.29

Associated Samples: All except 18I and 18D.

Method Blank: VBLKM8

Compound	Concentration in ug/L
Methylene Chloride	0.4 J
Acetone	16

TIC	RT
Butylated hydroxytoluene	22.19

Associated Samples: 18I and 18D.

Four trip blanks (TB053001, TB053101, TB060101, and TB060401) were collected along with this sample set. The following compounds were detected in the trip blanks:

Trip Blank: TB053001

Compound	Concentration in ug/L
Methylene Chloride	2 JB

Associated Samples: 21I, 21S, and 18S.

Trip Blank: TB053101

Compound	Concentration in ug/L
Methylene Chloride	2 JB

Associated Samples: HN-24I, HN-29I, HN-29D, and FW-03.

Trip Blank: TB060101

Compound	Concentration in ug/L
Methylene Chloride	2 JB
Acetone	2 JB

Associated Samples: 37D and 37D2.

Trip Blank: TB060401

Compound	Concentration in ug/L
Methylene Chloride	2 JB

Associated Samples: 18I and 18D.

Three field blanks (FB053001, FB053101, and FB060401) were also collected with this sample set. The following compounds and TIC were detected in the field blanks:

Field Blank: FB053001

Compound	Concentration in ug/L
Methylene Chloride	2 JB
1,1-Dichloroethene	0.7 J
Trichloroethene	0.3 J
Benzene	0.2 J

Compound	Concentration in ug/L
Tetrachloroethene	0.1 J
Toluene	0.4 J
Chlorobenzene	0.2 J
1,1,2-Trichlorotrifluoroethane	0.3 J

Associated Samples: 21I, 21S, and 18S.

Field Blank: FB053101

Compound	Concentration in ug/L
Methylene Chloride	3 JB
1,1-Dichloroethene	0.6 J
Trichloroethene	0.5 J
Benzene	0.4 J
Acetone	3 JB
Toluene	0.5 J
Chlorobenzene	0.3 J

TIC	RT
Unknown siloxane	23.03

Associated Samples: HN-24I, HN-29I, HN-29D, and FW-03.

Field Blank: FB060401

Compound	Concentration in ug/L
Methylene Chloride	1 JB

Associated Samples: 18I and 18D.

The following compounds were qualified as non-detect (U) based on the blank results:

Compound	Sample ID
Methylene Chloride	All samples.
Acetone	18S and 37D
1,1-Dichloroethene	HN-29I
Trichloroethene	21I, HN-29I and HN-29D
Toluene	HN-29I and FW-03
1,1,2-Trichlorotrifluoroethane	18S

VI. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

VII. MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample 18I was used for the MS/MSD analyses and MSB. Spike recoveries and RPD values were within control limits for the MS/MSD and MSB.

A QCS spike summary was also provided with this SDG. Eight compounds were not within QC limits. No qualification of the data was necessary based on the spike results.

VIII. INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

IX. TARGET COMPOUND IDENTIFICATION

Methyl acetate was detected in sample 37D and reported incorrectly on the quantitation report as a target compound. Methyl acetate is not a target compound, therefore, it was placed on the TIC report.

X. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

XI. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

The TICs detected in the blanks were reported correctly.

XII. OVERALL ASSESSMENT OF DATA

The data is acceptable with the qualifications listed above.

SDG 7001-1345B

I. HOLDING TIMES

All samples were analyzed within holding time requirements.

II. GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

III. INITIAL CALIBRATION

Two initial calibrations were performed on March 15 and May 23, 2001. All compound relative response factors (RRFs) found to be >0.05. The following compound relative standard deviations (%RSDs) was found to be >30%:

Calibration Date: 03/15/01

Compound	%RSD
2-Hexanone	51.0%

Associated Samples: TB060601, FB060601, 13D, N-10627, 33D2, 20D, 36D, TB060701, 75D2, and 36D2.

2-Hexanone was qualified as estimated (J) if detected in the associated samples.

IV. CONTINUING CALIBRATION

Three continuing calibrations were performed on June 8,13, and 14, 2001. The compounds had RRFs > 0.05 and percent differences (%Ds) <25% except for the following:

Calibration Date: 06/08/01

Compound	%D
Chloromethane	-27.4
Acetone	-52.1
2-Butanone	-30.4

Associated Samples: TB060501, 78S, 74D, 74I, 74D2, FB060501, 78I, 20I, 73D2, and REP3.

Calibration Date: 06/13/01

Compound	%D
2-Butanone	-26.5
2-Hexanone	50.7

Associated Samples: TB060601, TB060701, FB060601, 13D, N-10627, 33D2, 20D, 36D, and 75D2.

Calibration Date: 06/14/01

Compound	%D
Tetrachloroethene	-25.1

Associated Sample: 36D2.

The above compounds were qualified as estimated (J) if detected, and estimated (UJ) if not detected in the associated samples.

V. BLANKS

Three method blanks (VBLKMA, VBLKKH, and VBLKKI) were analyzed with this SDG. The following compound and/or TIC were detected in the method blanks:

Method Blank: VBLKMA

TIC	Retention Time
Butylated hydroxytoluene	22:40

Associated Samples: 78S, 78I, 74I, 74D, 74D2, 73D2, REP3, and 20I.

Method Blank: VBLKKH

Compound	Concentration in ug/L
Methylene Chloride	2 J

Associated Samples: 13D, N-10627, 75D2, 33D2, 20D, and 36D.

Method Blank: VBLKKI

TIC	Retention Time
Butylated hydroxytoluene	22.37

Associated Sample: 36D2.

Three trip blanks (TB060501, TB060601, and TB060701) were collected along with this sample set. The following compound was detected in the trip blanks:

Trip Blank: TB060501

Compound	Concentration in ug/L
Methylene Chloride	2 J

Associated Samples: 74I, 74D, 74D2, 73D2, REP3, and 20I.

Trip Blank: TB060601

Compound	Concentration in ug/L
Methylene Chloride	2 JB

Associated Samples: 13D, N-10627, 75D2, 33D2, and 20D.

Trip Blank: TB060701

Compound	Concentration in ug/L
Methylene Chloride	2 JB

Associated Samples: 36D and 36D2.

One trip blank associated with samples in this SDG was analyzed in another SDG, 7001-1345A, and is summarized here. The following compound was detected in the trip blank:

Trip Blank: TB060401

Compound	Concentration in ug/L
Methylene Chloride	2 JB

Associated Samples: 78S and 78I.

Two field blanks (FB060501, and FB060601) were also collected with this sample set. The following compound was detected in the field blanks:

Field Blank: FB060501

Compound	Concentration in ug/L
Methylene Chloride	2 J

Associated Samples: 74I, 74D, 74D2, 73D2, REP3, and 20I.

Field Blank: FB060601

Compound	Concentration in ug/L
Methylene Chloride	1 JB

Associated Samples: 13D, N-10627, 75D2, 33D2, and 20D.

One field blank associated with samples in this SDG was analyzed in another SDG, 7001-1345A, and is summarized here. The following compound was detected in the field blank:

Field Blank: FB060401

Compound	Concentration in ug/L
Methylene Chloride	1 JB

Associated Samples: 78S and 78I.

Methylene chloride was qualified as non-detect (U) based on the blank results in samples 78S, 78I, 74I, 74D, REP3, 13D, 74D2, 73D2, N-10627, 20D, 36D2, 20I, 75D2, and 33D2.

VI. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

VII. MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample 74I and 36D were used for the MS/MSD analyses and MSB. Spike recoveries and RPD values were within control limits for the MS/MSDand MSB.

Two QCS spike summaries were also provided with this SDG. Twenty-seven compounds were not within QC limits. No qualification of the data was necessary based on the spike results.

VIII. INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

IX. TARGET COMPOUND IDENTIFICATION

All compounds were identified correctly.

X. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

XI. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

The TICs detected in the blanks were reported correctly.

XII. OVERALL ASSESSMENT OF DATA

Sample 73D2 was replicated and labeled REP3. Based on field logs and historical data, it appears that the bottle ware for REP3 and 20I were switched. The results for 73D2 and 20I, which is actually REP3, were acceptable.

The data is acceptable with the qualifications listed above.

SDG 7001-1345C

I. HOLDING TIMES

All samples were analyzed within holding time requirements.

II. GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

III. INITIAL CALIBRATION

One initial calibration was performed on March 15, 2001. All compound RRFs found to be >0.05. The following compound %RSD was found to be > 30%:

Calibration Date: 03/15/01

Compound	%RSD
2-Hexanone	51.0%

Associated Samples: REP4 and 35D2.

2-Hexanone was qualified as estimated (J) if detected in the associated samples.

IV. CONTINUING CALIBRATION

Two continuing calibrations were performed on June 13 and 14, 2001. The compounds had RRFs > 0.05 and percent differences (%Ds) <25% except for the following:

Calibration Date: 06/13/01

Compound	%D
2-Butanone	-26.5
2-Hexanone	50.7

Associated Sample: REP4.

Calibration Date: 06/14/01

Compound	%D
Tetrachloroethene	-25.1

Associated Sample: 35D2.

The above compounds were qualified as estimated (J) if detected, and estimated (UJ) if not detected in the associated samples.

V. BLANKS

Two method blanks (VBLKKH and VBLKKI) were analyzed with this SDG. The following compound or TIC was detected in the method blanks:

Method Blank: VBLKKH	
Compound	Concentration in ug/L
Methylene Chloride	2 J

Associated Sample: REP4.

Method Blank: VBLKKI	
TIC	RT
Butylated hydroxytoluene	22.37

Associated Sample: 35D2.

One trip blank (TB060701) associated with samples in this SDG was analyzed in another SDG 7001-1345B and is summarized here. The following compound was detected in the trip blank:

Trip Blank: TB060701	
Compound	Concentration in ug/L
Methylene Chloride	2 JB

Associated Samples: REP4 and 35D2.

Methylene chloride was qualified as non-detect (U) based on the blank results in sample REP4 and 35D2.

VI. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

VII. MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample 36D from SDG 7001-1345B was used for the MS/MSD analyses and MSB. Spike recoveries and RPD values were within control limits for the MS/MSD and MSB.

VIII. INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

IX. TARGET COMPOUND IDENTIFICATION

All compounds were identified correctly.

X. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

XI. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

The TIC detected in the blanks was reported correctly.

XII. OVERALL ASSESSMENT OF DATA

Sample 35D-2 was replicated and labeled REP4. The results were acceptable.

The data is acceptable with the qualifications listed above.

SDG 7001-1612A

I. HOLDING TIMES

All samples were analyzed within holding time requirements.

II. GC/MS INSTRUMENT PERFORMANCE CHECK

All GC/MS instrument tunes were within criteria.

III. INITIAL CALIBRATION

One initial calibration was performed on June 18, 2001. All compound RRFs were found to be >0.05 and all compound %RSDs were found to be <30%. No qualification of the data was necessary based on the initial calibration results.

IV. CONTINUING CALIBRATION

Two continuing calibrations were performed on June 26 and 27, 2001. The compounds had RRFs >0.05. The following percent differences (%Ds) were >25%:

Calibration Date: 06/27/01

Compound	%D
Acetone	-45.2
2-Butanone	-46.8
4-Methyl-2-pentanone	-35.5
2-Hexanone	-35.3
2-Chloroethylvinylether	-31.5

Associated samples: ONCT INF and REP-1.

V. BLANKS

Two method blanks (VBLKMG and VBLKMH) were analyzed with the samples in this SDG. The following compound or TIC were detected in the method blanks:

Method Blank VBLKMG

Compound	Concentration in ug/L
Acetone	11

Associated samples: ONCT-1, ONCT-2, ONCT-3, ONCT EFF, GP-1, GP-3, GP 1/3 INF, and GP 1/3 EFF.

Method Blank VBLKMH

TIC	Retention Time (RT)
Butylated hydroxytoluene	22.62

Associated samples: ONCT INF and REP-1.

One trip blank was analyzed with this SDG. The following target compounds were detected in the trip blank:

Trip Blank TB062101

Compound	Concentration in ug/L
Methylene chloride	2 J

Associated samples: All samples.

Based on the blank results methylene chloride was qualified as non-detect (U) at the method detection limits or non-detect (U), if above the detection limits in all samples. Acetone was qualified as non-detect (U) at the method detection limits

or non-detect (U), if above the detection limits in ONCT-1, GP-1, GP-3, and GP 1/3 INF.

VI. SYSTEM MONITORING COMPOUNDS (SURROGATE SPIKES)

All surrogate spike recoveries were within control limits for all samples and blanks.

VII. MATRIX SPIKES/MATRIX SPIKE DUPLICATES

Sample GP 1/3 INF was used for the MS/MSD analyses and MSB. The spike recoveries were within QC limits. One RPD value was outside control limits for the MS/MSD. No qualification of the data was necessary.

The laboratory also provided a QCS spike summary. The percent recoveries (%R) for seventeen compounds were outside QC limits. No qualifications were necessary.

VIII. INTERNAL STANDARDS

All internal standard area counts and retention times were within control limits for all samples and blanks.

IX. TARGET COMPOUND IDENTIFICATION

Target compounds detected in the samples were reported correctly.

X. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

All compound detection limits were met.

XI. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

Tentatively identified compounds (TICs) were detected in this sample set and were reported correctly. The Form I TIC data sheets were not included in the sample data package for samples ONCT INF and REP-1. Photocopies were made from the data summary package and inserted in the sample data package.

XII. OVERALL ASSESSMENT OF DATA

Sample ONCT INF was replicated and labeled REP-1. The results were acceptable with no qualification of the data.

The data is acceptable with the qualifications listed above.

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers 7001-1058A, 7001-1058B, 7001-1058C, 7001-1345A, 7001-1345A, 7001-1345B, 7001-1345C and 7001-1612A.

ARCADIS G&M, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG 7001-1058A			
FB043001	011058A-01	04/30/01	05/01/01
TB043001	011058A-02	04/30/01	05/01/01
15D	011058A-03	04/30/01	05/01/01
15D2	011058A-04	04/30/01	05/01/01
TB050101	011058A-05	05/01/01	05/02/01
FB050101	011058A-06	05/01/01	05/02/01
16I	011058A-07	05/01/01	05/02/01
15I	011058A-08	05/01/01	05/02/01
17D	011058A-09	05/01/01	05/02/01
TB050201	011058A-10	05/02/01	05/03/01
FB050201	011058A-11	05/02/01	05/03/01
15S	011058A-12	05/02/01	05/03/01
17SR	011058A-13	05/02/01	05/03/01
17I	011058A-14	05/02/01	05/03/01
79D	011058A-15	05/03/01	05/04/01
34D	011058A-16	05/03/01	05/04/01
34D2	011058A-17	05/03/01	05/04/01
FB050301	011058A-18	05/03/01	05/04/01
TB050301	011058A-19	05/03/01	05/04/01

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers 7001-1058A, 7001-1058B, 7001-1058C, 7001-1345A, 7001-1345A, 7001-1345B, 7001-1345C and 7001-1612A.

ARCADIS G&M, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG 7001-1058B			
FB050401	011058B-01	05/04/01	05/05/01
TB050401	011058B-02	05/04/01	05/05/01
HN-42S	011058B-03	05/04/01	05/05/01
HN-42I	011058B-04	05/04/01	05/05/01
HN-40S	011058B-05	05/04/01	05/05/01
HN-40I	011058B-06	05/04/01	05/05/01
TB050701	011058B-07	05/07/01	05/08/01
FB050701	011058B-08	05/07/01	05/08/01
N-10634	011058B-09	05/07/01	05/08/01
79I	011058B-10	05/07/01	05/08/01
14	011058B-11	05/07/01	05/08/01
MW-3R	011058B-12	05/08/01	05/09/01
N-10631	011058B-13	05/08/01	05/09/01
GM-16SR	011058B-14	05/08/01	05/09/01
FB050801	011058B-15	05/08/01	05/09/01
TB050801	011058B-16	05/08/01	05/09/01
REP-1	011058B-17	05/08/01	05/09/01
TB051001	011058B-18	05/10/01	05/11/01
71D2	011058B-19	05/10/01	05/11/01
70D2	011058B-20	05/10/01	05/11/01

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers 7001-1058A, 7001-1058B, 7001-1058C, 7001-1345A, 7001-1345A, 7001-1345B, 7001-1345C and 7001-1612A.

ARCADIS G&M, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG 7001-1058C			
TB051101	011058C-01	05/11/01	05/14/01
38D	011058C-02	05/11/01	05/14/01
38D2	011058C-03	05/11/01	05/14/01
REP051101	011058C-04	05/11/01	05/14/01
SDG 7001-1345A			
TB053001	011345A-01	05/30/01	05/31/01
FB053001	011345A-02	05/30/01	05/31/01
21I	011345A-03	05/30/01	05/31/01
21S	011345A-04	05/30/01	05/31/01
18S	011345A-05	05/30/01	05/31/01
TB053101	011345A-06	05/31/01	06/01/01
FB053101	011345A-07	05/31/01	06/01/01
HN-24I	011345A-08	05/31/01	06/01/01
HN-29I	011345A-09	05/31/01	06/01/01
HN-29D	011345A-10	05/31/01	06/01/01
FW-03	011345A-11	05/31/01	06/01/01
TB060101	011345A-12	06/01/01	06/02/01
37D	011345A-13	06/01/01	06/02/01
37D2	011345A-14	06/01/01	06/02/01
TB060401	011345A-15	06/04/01	06/05/01
FB060401	011345A-16	06/04/01	06/05/01
18I	011345A-17	06/04/01	06/05/01
18D	011345A-18	06/04/01	06/05/01

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers 7001-1058A, 7001-1058B, 7001-1058C, 7001-1345A, 7001-1345A, 7001-1345B, 7001-1345C and 7001-1612A.

ARCADIS G&M, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG 7001-1345B			
78S	011345B-01	06/04/01	06/05/01
78I	011345B-02	06/04/01	06/05/01
TB060501	011345B-03	06/05/01	06/06/01
FB060501	011345B-04	06/05/01	06/06/01
74I	011345B-05	06/05/01	06/06/01
74D	011345B-06	06/05/01	06/06/01
74D2	011345B-07	06/05/01	06/06/01
73D2	011345B-08	06/05/01	06/06/01
REP3	011345B-09	06/05/01	06/06/01
20I	011345B-10	06/05/01	06/06/01
FB060601	011345B-11	06/06/01	06/07/01
TB060601	011345B-12	06/06/01	06/07/01
13D	011345B-13	06/06/01	06/07/01
N-10627	011345B-14	06/06/01	06/07/01
75D2	011345B-15	06/06/01	06/07/01
33D2	011345B-16	06/06/01	06/07/01
20D	011345B-17	06/06/01	06/07/01
TB060701	011345B-18	06/07/01	06/08/01
36D	011345B-19	06/07/01	06/08/01
36D2	011345B-20	06/07/01	06/08/01
SDG 7001-1345C			
35D2	011345C-01	06/07/01	06/08/01
REP4	011345C-02	06/07/01	06/08/01

Table 1. Sample Identification, Collection Dates, and Laboratory Received Dates for Samples Analyzed Under STL Sample Delivery Group Numbers 7001-1058A, 7001-1058B, 7001-1058C, 7001-1345A, 7001-1345A, 7001-1345B, 7001-1345C and 7001-1612A.

ARCADIS G&M, Inc. ID	Laboratory ID	Date Collected	Date Received
SDG 7001-1612A			
ONCT-1	011612A-01	06/21/01	06/22/01
ONCT-2	011612A-02	06/21/01	06/22/01
ONCT-3	011612A-03	06/21/01	06/22/01
ONCT INF	011612A-04	06/21/01	06/22/01
ONCT EFF	011612A-05	06/21/01	06/22/01
GP-1	011612A-06	06/21/01	06/22/01
GP-3	011612A-07	06/21/01	06/22/01
GP 1/3 INF	011612A-08	06/21/01	06/22/01
GP 1/3 EFF	011612A-09	06/21/01	06/22/01
REP-1	011612A-10	06/21/01	06/22/01
TB062101	011612A-11	06/21/01	06/22/01

ARCADIS Geraghty & Miller, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249-7600
Fax 631 249-7610

MEMO

To:
David Stern

Copies:

ENVIRONMENTAL

From:
Donna M. Brown and Danielle Petkus

Date:
31 July 2001

Subject:
Data Validation of Cadmium, Chromium, and Semi-Volatile Organic Compounds for Groundwater Samples Collected from the Second Quarter 2001, Off-Site Monitoring Program, Northrop Grumman, Bethpage, New York (Project No. NY1321.1 Task 0004).

Five groundwater samples, two replicates, and one field blank were collected on May 8 and June 4, 2001 in the vicinity of the Northrop Grumman site, Bethpage, New York. The samples were sent to Severn Trent Laboratories (STL) in Shelton, Connecticut for the analysis of cadmium and chromium using SW846 methods ICAP 3010A/6010B.

A groundwater sample and field blank were collected on May 7, 2001 in the vicinity of the Northrop Grumman site, Bethpage, New York. The samples were sent to Severn Trent Laboratories (STL) in Shelton, Connecticut for the analysis of semi-volatile organic compounds (SVOCs) following GC/MS using New York State Department of Environmental Conservation (NYSDEC) 10/95 Method NYDEC 95-1.

The samples were analyzed for cadmium, chromium, and SVOCs, and are included in sample delivery groups (SDG) 7001-1058B, 1345A, and 1345B. The VOC results in were fully validated and are discussed in a separate memorandum. The metal and SVOC results were reviewed for the following:

- Chain-of-custody form,
- holding times,
- method and field blanks,
- spike sample recovery,
- and field duplicates.

Our ref.:
F:\Chemical\Data-val\GRUMMAN\BETHPAGE\GRU0701MSV.doc

The data were complete and acceptable. All qualifiers added to the results are discussed below by analysis.

Metals

One field replicate was collected in with samples analyzed in SDG 7001-1058B. Sample MW-3R was replicated and labeled REP-1. The duplicate results were acceptable.

Sample 78I was replicated and labeled REP2M. Sample 78I was analyzed in SDG 7001-1345B. REP2M was analyzed in SDG 7001-1345A. The duplicate results were acceptable.

SVOCs

One method blank was analyzed with this set. The following tentatively identified compounds (TICs) were detected in the method blank:

Method Blank SBLKOS

TIC	RT
Unknown alkane	27.28
Unknown alkane	26.62

Associated samples: All samples.

One field blank was analyzed with this sample set. The following TICs were detected in the field blank.

Field Blank FB050701

TIC	RT
Unknown alkane	28.01
Unknown	28.84
Unknown alkane	26.61
Unknown alkane	27.27
Unknown	29.80

Associated samples: All samples.

Based on the blank results, the following TICs were qualified as unusable (R) in sample 14.

TIC	RT
Unknown alkane	27.28
Unknown alkane	28.01
Unknown alkane	28.84
Unknown alkane	26.61