Quarterly Operations Report
Second Quarter 2013

Groundwater Treatment Plant
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant
Bethpage, New York

Contract No. N40085-10-D-9409
Contract Task Order No. 0002

December 2013

Prepared for:

Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, VA 23511

Prepared by:

H&S Environmental, Inc.
160 East Main Street, Suite 2F
Westborough, Massachusetts 01581
(508) 366-7442

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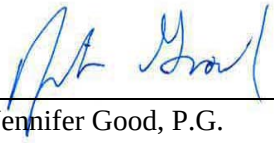
Patrick Schauble, P.E. — Date
Program Manager



12/13/13

Jennifer Good, P.G. — Date
Project Manager

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APPENDICES

Acronyms and Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirement
AS	air stripper
ASE	air stripper effluent
BFE	bag filter effluent
bgs	below ground surface
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
DAR	Division of Air Resources
DCA	dichloroethane
DCE	dichloroethene
DMR	Discharge Monitoring Report
DO	dissolved oxygen
DoD	Department of Defense
DTW	depth to water
ECL	Environmental Conservation Law
EB	equipment rinsate blank
ELAP	Environmental Laboratory Accreditation Program
GOCO	Government Owned Contractor Operated
gpm	gallon per minute
GWTP	groundwater treatment plant
H&S	H&S Environmental, Inc.
HMI	human-machine interface
IRP	Installation Restoration Program
LGAC	liquid-phase granular activated carbon
MS/MSD	matrix spike/matrix spike duplicate
NAVFAC	Naval Facilities Engineering Command Mid-Atlantic
NELAC	National Environmental Accreditation Conference
NG	Northrop Grumman
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
ORP	oxidation reduction potential
OU	operable unit
PCE	tetrachloroethene

PLC	programmable logic controller
QA/QC	quality assurance / quality control
ROD	Record of Decision
RPD	relative percent difference
SC	standard conductivity
scfm	standard cubic feet per minute
SPDES	Storm Pollution Discharge Elimination System
TB	trip blank
TCE	trichloroethene
TE	treated effluent
TSS	total suspended solids
TtEC	Tetra Tech EC, Inc.
USEPA	U.S. Environmental Protection Agency
VC	vinyl chloride
VGAC	vapor–phase granular activated carbon
VOC	volatile organic compound

1.0 INTRODUCTION

H&S Environmental, Inc. (H&S) has prepared this Quarterly Operations Report for the GM-38 Area Groundwater Treatment Plant (GWTP) at the Naval Weapons Industrial Reserve Plant (NWIRP) in Bethpage, New York. This report has been prepared for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic, under Contract No. N40085-10-D-9409, Contract Task Order No. 0002. This Second Quarter 2013 Operations Report details activities that occurred from April 2013 to June 2013. Data was collected and operational activities were performed by H&S in accordance with the following documents:

- *Final Operation, Maintenance & Monitoring Plan for Groundwater Treatment Plant GM-38 Area Groundwater Remediation, Naval Weapons Industrial Reserve Plant, Bethpage, New York* prepared by Tetra Tech EC, Inc. (TtEC) in 2010, hereafter referred to as the "O&M Manual."
- *Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), UFP-SAP for Operations, Maintenance, and Monitoring of the Groundwater Treatment Plant, GM-38 Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York* prepared by TtEC in 2010.

1.1 Background

NWIRP Bethpage is located in east central Nassau County, Long Island, New York, approximately 30 miles east of New York City (**Figure 1**) and is currently listed by New York State Department of Environmental Conservation (NYSDEC) as an "inactive hazardous waste site" (#1-30-003B). Historically, the Navy's property totaled approximately 109.5 acres and was a Government Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until September 1998. NWIRP Bethpage is bordered on the north, west, and south by property owned, or formerly owned, by NG that covered approximately 605 acres, and on the east by a residential neighborhood.

The GM-38 Area refers to a cluster of monitoring wells installed in the 1990s by NG. The GM-38 Area is approximately 8,500 feet south, southeast and hydraulically downgradient of NWIRP Bethpage. The GWTP is located within a utility easement with a street address of 100 Broadway, Bethpage, NY.

The "hot spot" cleanup remedy for the GM-38 Area groundwater was originally set forth in Record of Decision (ROD) documents for Operable Unit 2 (OU 2) Groundwater for the NGC and NWIRP Sites (New York State Registry Site Numbers 1-30-003A & 1-30-003B, respectively) issued by NYSDEC Division of Environmental Remediation in March 2001 and for the NWIRP Bethpage Site by NAVFAC in April 2003 (Revision 1). The selected remedy was chosen in accordance with the New York State Environmental Conservation Law (ECL) and the Navy's Installation Restoration Program (IRP). It is also consistent with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended, 42 U.S.C. §§ 9601-9675.

1.2 GWTP Overview

Groundwater is extracted from recovery wells RW-1 and RW-3 and treated in the GWTP. The treatment process consists of flow equalization, air stripping and vapor-phase carbon treatment, bag filtration, and liquid-phase carbon treatment. Though the GWTP was originally equipped with a pH adjustment system utilizing sodium hydroxide, it has since been determined that pH adjustment is not necessary and the equipment has been taken off-line and sodium hydroxide sent off site for beneficial reuse. A process flow diagram is presented as **Figure 2**. The treated water is either re-injected into injection well IW-1 or discharged into the Nassau County Recharge Basin #495. Under CERCLA, the Navy is required to meet the effluent requirement in the NYSDEC's Storm Pollution Discharge Elimination System (SPDES) Permit Application as an Applicable or Relevant and Appropriate Requirements (ARAR).

The GWTP was designed to operate at an average flow rate of 1,100 gallons per minute (gpm) (800 gpm from RW-1 and 300 gpm from RW-3), as measured by the average discharge flow rate. It was determined that this flow rate would be necessary to effectively contain the higher concentration of contaminated groundwater in the GM-38 Area. Volatile Organic Compounds (VOCs) in the influent groundwater consist of trichloroethene (TCE), tetrachloroethene (PCE), vinyl chloride (VC), cis-1,2-dichloroethene (cis-1,2-DCE), 1,2-dichloroethane (1,2-DCA), benzene, toluene, and total xylenes.

The air stripper (AS) is a structural aluminum tower that is packed with 3.5-inch diameter polypropylene Jaeger Tripack. Groundwater is pumped to the air stripper distribution port and sprayed over the column of Jaeger Tripack at a flow rate of approximately 1,100 gpm. Previously, 100 gpm of recirculated water was also rerouted through the AS, but as of October 2010, recirculation was no longer deemed necessary to the operation of the system. An induced draft countercurrent flow of air enters the air stripper below the base of the packing material at a rate of 8,000 standard cubic feet per minute (scfm). The large surface area of the packing material allows for a mass transfer of the VOCs from the groundwater into the air stream. The VOCs in the off-gas, except for vinyl chloride, are removed via two 20,000-lb vapor phase granular activated carbon (VGAC) units (VGAC-1 and VGAC-2). Vinyl chloride is oxidized by a 20,000-lb vessel containing zeolite impregnated with potassium permanganate (VGAC-3) into potassium chloride and carbon dioxide. The potassium chloride remains in the pore structure of the zeolite substrate. The treated off-gas is discharged from the stack.

Water treated by the air stripper is processed through three 8,000-lb liquid phase granular activated carbon (LGAC) units in parallel prior to discharge in the recovery basin (or injection well, if necessary).

The GWTP is controlled by a programmable logic controller (PLC)-based digital and analog control system, with instrumentation that monitors pH, pressure, tank level, flow transmitters, differential pressure transmitters, water level in recovery wells, and motor operational status. The information in the PLC is made available to an operator via a human-machine interface (HMI) program. By using this program, the status of the GWTP can be displayed in real time and adjusted, if necessary, by the operator.

2.0 GWTP OPERATIONS AND MAINTENANCE

While designed to run completely automated, the GWTP requires regular weekly visits by an operator to record and adjust operational parameters and to perform scheduled maintenance. The GWTP is equipped with telemetry that will alert an on-call operator in the event of a plant shutdown.

2.1 Routine Maintenance Activities

Routine maintenance activities at the GWTP were performed during the operator's weekly visits. These activities include general site inspections, collection of operational data (water and vapor flowrates, differential pressures across the AS, carbon units, bag filter units and blower discharge pressures, tank levels and totalizer readings), measurement of water levels in the recovery wells, adjustment of pump signal settings, collection of vapor and process water samples, changing out of bag filters, switching of lead/lag pump assignments, and preventive maintenance of system equipment. In addition, the following maintenance tasks were also performed during this reporting period:

- On 24 April, the GWTP intake air filters were replaced.
- On 8 May, the system was shut down in order to backwash the three LGAC units.
- On 5 June, the system was shut down in order to clean the bag filter housing unit and change out the bag filters.

2.2 Non-routine Maintenance / Site Activities

The following non-routine activities were performed during the Second Quarter:

- On 29 March, the system was manually shut down for implementation of a pumping test for the GM-38 Area. Recovery wells RW-1 and RW-3 were operated at various flow rates during the pumping test. The pumping test was completed and the system resumed normal operation on 15 April. Results of the pumping test are provided under separate cover by others.
- On 9 April, Verizon was on site to repair two downed phone lines.
- On 25 May, 8 June, and 10 June, the system went down due to a high rain gauge alarm. On each occasion, the system was restarted once heavy rainfall subsided.

3.0 GWTP MONITORING

The intent of the GWTP is to remove contaminant mass and reduce elevated VOC levels to levels similar to those in the surrounding aquifer. It is anticipated that GWTP operation will minimize contaminant impacts on water supply wells and currently unaffected portions of the groundwater aquifer. The GWTP is not intended to remediate groundwater contamination in the local aquifer to non-detectable levels (TtEC 2010). Various process samples (water and vapor) are collected on a monthly basis to monitor GWTP efficiency and to ensure compliance with Federal and State effluent discharge and air emission requirements. In addition, groundwater samples are collected quarterly to monitor water quality and determine the effectiveness of the remediation activities and monitor the hydraulic containment and capture of impacted groundwater by the recovery wells.

3.1 Process Water Quality Monitoring

Processed groundwater is analyzed to comply with calculations submitted by the Navy and approved by NYSDEC Water Division for the effluent limitations and monitoring requirements. These results are also submitted to the NYSDEC on a monthly basis in the form of a Discharge Monitoring Report (DMR). A copy of the approved NYSDEC effluent limitation and monitoring constituents and the reporting forms are included in **Appendix A**.

Monthly aqueous samples are collected from each recovery well (RW-1 and RW-3), as well as the treated effluent (TE) discharge line. In addition, various intermediary process system samples are collected monthly, consisting of air stripper effluent (ASE), bag filter effluent (BFE), and effluent of each of the three LGAC units (LC1, LC2, and LC3). The analytical results of monthly process water samples collected during the Second Quarter are presented in **Table 1**. The data demonstrates that all permitted constituents were in compliance with regulatory requirements during the Second Quarter. **Table 1** also summarizes the average monthly flowrates in gallons per minute along with the total volume of water processed during each month of the Second Quarter.

Monthly DMRs for the Second Quarter (April – June 2013) are included in **Appendix A**.

3.2 Air Quality Monitoring

Treated off-gas discharged at the stack of the GWTP is subject to emissions limitations as described by the calculations submitted by the Navy and approved by the NYSDEC Division of Air Resources (DAR) in July 2009. A copy of the NYSDEC approved calculations is included as **Appendix B**.

While only sampling of the stack emissions is required for NYSDEC compliance, process vapor samples are also collected using 6-L summa canisters at various locations to monitor for breakthrough of the VGAC units. The analytical results of monthly influent and effluent vapor samples as well as midfluent samples (VC12 and VC13) collected during the Second Quarter are presented in **Table 2**. Air emissions calculations using the stack vapor concentrations along with discharge flowrates are presented in **Table 3**. The calculations demonstrate that all constituents were within the regulatory requirements during the Second Quarter based on the emission rates in pounds per hour (lb/hr).

3.3 Groundwater Quality Monitoring

The groundwater monitoring well system at the GM-38 Groundwater Remediation Area consists of fourteen monitoring wells (as summarized in **Table 4**), three recovery wells (RW-1, RW-2, RW-3) and one injection well (IW-1). Though RW-2 was installed in 2005, a pump was never installed in this well and the well is not operated as a recovery well due to concerns expressed by the Bethpage Water District. Well locations are depicted on **Figure 3**.

Depth to water (DTW) measurements are collected from twelve of the monitoring wells and water quality samples are collected from eight of the monitoring wells on a quarterly basis. The monitoring network includes well clusters located near the recovery and injection wells as described below and as shown on **Figure 3**. In addition, two wells, GM-38D and GM-38D2, located at the corner of Arthur Avenue and Broadway, are monitored by others.

Quarterly groundwater samples were collected from eight monitoring wells (RW1-MW1, RW1-MW3, RW2-MW1, RW3-MW1, RW3-MW2, RW3-MW3, RW3-MW4, and TP-01). Samples were collected using bladder pumps in accordance with the U.S. Environmental Protection Agency (USEPA) low-flow sampling methodologies. Results of the groundwater sampling for the Second Quarter are presented in Section 3.3.1 below, and descriptions of monitoring well locations are as follows:

Recovery Well 1 (RW-1) Monitoring Wells
The RW-1 cluster consists of three monitoring wells screened between 395 and 435 feet below ground surface (bgs). RW1-MW1 is located approximately 140 feet northwest of RW-1 and RW1-MW2 is located approximately 50 feet north of RW-1. RW1-MW3 is located approximately 400 feet northeast of RW-1, on the eastern side of Seaford Oyster Bay Expressway. All three wells are hydraulically monitored while only RW1-MW1 and RW1-MW3 are also monitored for water quality on a quarterly basis.

Recovery Well 2 (RW-2) Monitoring Wells
The RW-2 cluster consists of three monitoring wells screened between 470 and 510 feet bgs. RW-2 MW-1 is located approximately 60 feet northwest of RW-2, RW2-MW2 is located approximately 20 feet west of RW-2, and RW2-MW3 is located approximately 100 feet west of RW-2. All three wells are hydraulically monitored while only RW-2 MW1 is monitored for water quality on a quarterly basis.

Recovery Well 3 (RW-3) Monitoring Wells
The RW-3 cluster consists of four monitoring wells. RW3-MW1 and RW3-MW4 are screened between 475 and 495 feet bgs. RW3-MW2 and RW3-MW3 are screened between 330 and 350 ft bgs and 320 and 340 ft bgs, respectively. RW3-MW1 and RW3-MW2 are located approximately 500 feet west of the GM-38 cluster, at the intersection of Arthur Avenue and Leroy Avenue. RW3-MW3 and RW3-MW4 are located approximately 400 feet north of the intersection of Arthur Avenue and Broadway. All four wells are both hydraulically monitored and monitored for water quality on a quarterly basis.

TP-01
TP-01 is screened between 450 and 470 feet bgs and is located approximately 25 feet north of the GWTP building, inside the fenced area. It is hydraulically monitored to observe the change in water levels due to the influence from the pumping rates at the neighboring public water supply well field near the hot spot area and is also monitored for water quality on a quarterly basis.

Injection Well 1 (IW-1) Monitoring Well
There is one monitoring well associated with injection well IW-1. IW1-MW1 is screened between 130 and 150 feet bgs, is located approximately 20 feet south of IW-1, and is only hydraulically monitored on a quarterly basis.

3.3.1 Groundwater Quality Results

H&S collected groundwater samples for the Second Quarter from 17-21 June 2013. Field parameters measured during well purging, consisting of pH, specific conductance (SC), temperature, oxidation-reduction potential (ORP) and dissolved oxygen (DO), are summarized in **Table 5**. Following stabilization of field parameters, groundwater samples were collected. Copies of the field logs and chain of custody documentation are presented in **Appendix C**.

Groundwater samples were submitted to a National Environmental Laboratory Accreditation Conference (NELAC), Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) certified, laboratory, Analytical Laboratories Services, located in Middletown, PA. The samples were analyzed for VOCs via USEPA Method 524.2, mercury via USEPA Method 245.1, and total suspended solids (TSS) via USEPA Method SM20 2540D. Validated analytical results of samples collected during the June 2013 monitoring event are summarized in **Table 6.** Data validation reports are presented in **Appendix D**. Raw analytical data is provided under separate cover.

3.3.2 Quality Assurance/Quality Control Sampling

Quality assurance/quality control (QA/QC) samples were collected during the quarterly groundwater monitoring event in accordance with the *Final Sampling and Analysis Plan* (TtEC 2010a). These samples consisted of blind field duplicates (collected from RW3-MW1 during the Second Quarter), matrix spike/matrix spike duplicate (MS/MSD) samples, equipment rinsate blanks (EB) collected at a rate of one per sampling event, and trip blanks (TB) submitted at a rate of one per sample cooler. Low estimated levels of acetone and methylene chloride were detected in the equipment blank for this event, while no contaminants were detected in the trip blanks. These detected analytes are common laboratory contaminants and are considered as such. The overall lack of contamination in the blanks indicates that quality control requirements were achieved.

For field duplicate samples, the precision between the original sample and its duplicate is evaluated by calculating the relative percent difference (RPD). RPDs for the Second Quarter sampling event are presented in the data validation report in **Appendix D**. As indicated, RPDs for all analytes, when calculated, were below the guideline of 50%. This overall consistency between the samples and its duplicate verifies that proper sample collection methods were followed.

3.3.3 Groundwater Concentration Trends

Historical groundwater analytical results through the Second Quarter are presented in **Table 7**. Groundwater analytical results of select VOCs (cis-1,2-DCE, PCE, TCE, and VC) for the Second Quarter monitoring events are presented graphically as **Figure 4**. Additionally, concentration trends of select VOCs (cis-1,2-DCE, TCE, and PCE, as well as VC for RW-1) over time for each recovery well (RW-1 and RW-3 sampled monthly) and the eight monitoring wells sampled during the Second Quarter monitoring event are presented in **Figures 5 through 14** and discussed below.

Figure 5 presents concentrations detected at recovery well RW-1. Concentrations of TCE have decreased from initial concentrations in early 2010 (maximum value of 710 µg/L detected in February 2010), remaining around or below 300 µg/L since the latter half of 2012. During the Second Quarter 2013, concentrations ranged from 209-248 µg/L. Concentrations of cis-1,2-DCE have followed a similar trend, decreasing from a high of 160 µg/L in February 2010 to a low of 20.5 µg/L in November 2012. PCE concentrations have also exhibited decreasing trends over time, with concentrations decreasing from 180 µg/L in February 2010 to a low of 41.2 µg/L in April 2012. Concentrations of VC have decreased below initial concentrations in 2010. After reaching a maximum concentration of 61 µg/L in February 2010, VC concentrations have remained below 5.0 µg/L since the final quarter of 2011, decreasing to non-detectable levels during two out of three months in the Second Quarter 2013.

Figure 6 presents concentrations detected at recovery well RW-3. Concentrations of TCE have decreased from initial concentrations in February 2010 (660 µg/L). During the Second Quarter 2013, concentrations ranged from 190-211 µg/L. Concentrations of cis-1,2-DCE have remained consistently below 4.0 µg/L. PCE has been detected at low levels during only a few sampling event, including a detection of 0.38 µg/L in April 2013.

Figure 7 presents concentrations detected at RW1-MW1. The concentration of TCE in the Second Quarter 2013 (78 µg/L) was higher than initial concentrations observed in May 2005 (53.6 µg/L). However, TCE remains below the maximum concentration observed in May 2009 (140 µg/L). The concentration of cis-1,2-DCE in the Second Quarter 2013 (64 µg/L) was below both the initial concentration observed in May 2005 (78.6 µg/L) and maximum concentration observed in May 2009 (180 µg/L). Concentrations of PCE have remained consistently below 1.0 µg/L.

Figure 8 presents concentrations detected at RW1-MW3. Concentrations of cis-1,2-DCE and PCE have consistently remained below 1.0 µg/L and concentrations of TCE have remained near or below 2.0 µg/L.

Figure 9 presents concentrations detected at RW2-MW1. Concentrations of TCE have decreased substantially from original concentrations observed in May 2005 (37.6 µg/L), with a concentration of 12 µg/L observed in the Second Quarter 2013. Concentrations of cis-1,2-DCE have remained consistently low, with a maximum concentration of 4.6 µg/L detected in the Second Quarter 2013. PCE has not been detected during any sampling event.

Figure 10 presents concentrations detected at RW3-MW1. Concentrations of TCE in the Second Quarter 2013 (49 µg/L) were higher than initial concentrations observed in January 2010 (35.0 µg/L), though

remain less than maximum TCE concentrations observed in November 2010 (77.6 µg/L). No overall trend is discernible. Concentrations of cis-1,2-DCE and PCE have exhibited similar trends, increasing slightly from initial concentrations, but remaining consistently below 2.0 µg/L.

Figure 11 presents concentrations detected at RW3-MW2. TCE concentrations observed in the Second Quarter 2013 (140 µg/L) were slightly less than initial concentrations observed in January 2010 (160 µg/L), and less than the maximum concentration observed in April 2010 (211 µg/L). No overall trend is discernible. Concentrations of cis-1,2-DCE at this location have consistently remained between 1.0 – 2.0 µg/L, though falling to non-detectable levels in the Second Quarter 2013. PCE has not been detected during any sampling event with the exception of August 2012, when a concentration of 0.28 J µg/L was observed.

Figure 12 presents concentrations detected at RW3-MW3. A maximum concentration of TCE was detected at this location in the Second Quarter 2013 (410 µg/L), with a concentration somewhat higher than the initial concentration observed in January 2010 (350 µg/L). No overall trend is discernible. Concentrations of cis-1,2-DCE have remained near or below 2.0 µg/L and PCE has remained below 1.0 µg/L, with concentrations of both analytes falling to non-detectable levels in the Second Quarter 2013.

Figure 13 presents concentrations detected at RW3-MW4. TCE concentrations have decreased since the initial sampling event in January 2010 (21 µg/L) with the lowest concentration observed to date in the Second Quarter 2013 (1.8 µg/L). PCE had not been detected during any sampling event, and cis-1,2-DCE has not been detected since its detection during the initial sampling event in January 2010 (0.46 µg/L).

Figure 14 presents concentrations detected at TP-01. TCE concentrations have decreased since the initial sampling event in January 2010 (65 µg/L), with a concentration of 25 µg/L observed in the Second Quarter 2013. A similar trend exists for concentrations of cis-1,2-DCE. Concentrations have decreased from an initial value of 190 µg/L to 8.7 µg/L in the Second Quarter 2013, with concentrations fluctuating over time. PCE concentrations have remained fairly consistent over time, ranging from 3.3 µg/L in June 2011 to 6.0 µg/L in June 2012.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The intent of the groundwater treatment system at GM-38 is to remove mass and reduce elevated VOC concentrations to levels similar to those in the surrounding aquifer, and in doing so minimize the impacts on downgradient water supply wells and currently unaffected portions of the aquifer. Based on the removal of VOCs by the GWTP and decreasing contaminant concentration trends observed in the recovery wells and several of the monitoring wells, progress toward these goals is apparent. The GWTP should continue to be operated and monitored on a quarterly basis using the 14 monitoring wells. In addition, an evaluation was conducted to better determine the capture zone. The results of this evaluation will be addressed by others.

5.0 REFERENCES

Tetra Tech EC, Inc. (TtEC). 2010. *Final Operation, Maintenance & Monitoring Plan for Groundwater Treatment Plant GM-38 Area Groundwater Remediation, Naval Weapons Industrial Reserve Plant, Bethpage, New York.* April.

Tetra Tech EC, Inc. (TtEC). 2010a. *Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), UFP-SAP for Operations, Maintenance, and Monitoring of the Groundwater Treatment Plant, GM-38 Area, Naval Weapons Industrial Reserve Plant, Bethpage, New York.* September.

TABLES

Table 1
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Results
Second Quarter 2013

SPDES Parameters	Daily Maximum Goal	Units	April 2013									
Process Stream			RW-1	RW-3	Combined Influent [(1)] (RW-1 + RW-3)	Air Stripper Effluent (ASE)	Bag Filter Effluent (BFE)	Liquid Carbon 1 Effluent (LC1)	Liquid Carbon 2 Effluent (LC2)	Liquid Carbon 3 Effluent (LC3)	Treated Effluent (TE)	Treated Effluent (TE) Duplicate
Well Depth		ft	445	530	NA	NA	NA	NA	NA	NA	NA	NA
Screened Interval		ft	335-395 410-430	392-412 442-504	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Date			4/8/13									
Average Flowrate	1100	GPM	497	126	623	NR	622	NR	NR	NR	647	NR
Total Flow		gallons	21,454,800	5,454,100	26,908,900	NR	26,858,300	NR	NR	NR	27,932,000	NR
pH	5.5 - 8.5	SU	4.72	4.66	4.71	6.16	6.20	6.22	6.24	6.21	6.01	6.01
Carbon Tetrachloride	NA	µg/L	0.34 J	ND	0.27 J	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	2.7	2.6	2.7	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	µg/L	0.45 J	ND	0.36 J	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	3.7	1.9	3.3	ND	ND	ND	ND	ND	ND	ND
cis 1,2-Dichloroethene	5	µg/L	30.4	1.8	24.6	0.34 J	0.51 J	ND	ND	ND	ND	ND
trans 1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	63.0	0.38 J	50.2 J	0.53 J	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethene	5	µg/L	3.5	1.1	2.8	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	µg/L	212	211	212	2.7	2.2	ND	ND	ND	ND	ND
Vinyl Chloride	2	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercruy	0.25	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Suspended Solids (TSS)	NA	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 1
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Results
Second Quarter 2013

SPDES Parameters	Daily Maximum Goal	Units	May 2013									
Process Stream			RW-1	RW-3	Combined Influent [1] (RW-1 + RW-3)	Air Stripper Effluent (ASE)	Bag Filter Effluent (BFE)	Liquid Carbon 1 Effluent (LC1)	Liquid Carbon 2 Effluent (LC2)	Liquid Carbon 3 Effluent (LC3)	Treated Effluent (TE)	Treated Effluent (TE) Duplicate
Well Depth		ft	445	530	NA	NA	NA	NA	NA	NA	NA	NA
Screened Interval		ft	335-395 410-430	392-412 442-504	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Date			5/15/13									
Average Flowrate	1100	GPM	736	193	929	NR	927	NR	NR	NR	970	NR
Total Flow		gallons	32,849,233	8,599,067	41,448,300	NR	41,359,033	NR	NR	NR	43,299,167	NR
pH	5.5 - 8.5	SU	4.56	4.74	4.60	5.39	5.58	6.00	6.01	5.98	5.94	5.94
Carbon Tetrachloride	NA	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	2.8 J	2.4 J	2.7 J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	4.6 J	2.0 J	4.1 J	ND	ND	ND	ND	ND	ND	ND
cis 1,2-Dichloroethene	5	µg/L	25.5	1.9 J	20.6 J	0.45 J	0.31 J	0.28 J	0.29 J	0.31 J	0.31 J	0.34 J
trans 1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	60.2	ND	47.7	0.39 J	0.45 J	ND	ND	ND	ND	ND
1,1,1-Trichloroethene	5	µg/L	3.2 J	ND	2.5 J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	µg/L	239	241	239	2.1	2.2	0.43 J	ND	ND	ND	ND
Vinyl Chloride	2	µg/L	1.5 J	ND	1.2 J	ND	ND	ND	ND	ND	ND	ND
Mercruy	0.25	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Suspended Solids (TSS)	NA	mg/L	ND	7	1	ND	ND	ND	ND	ND	ND	ND

Table 1
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Results
Second Quarter 2013

SPDES Parameters	Daily Maximum Goal	Units	June 2013 [2]									
Process Stream			RW-1	RW-3	Combined Influent [1] (RW-1 + RW-3)	Air Stripper Effluent (ASE)	Bag Filter Effluent (BFE)	Liquid Carbon 1 Effluent (LC1)	Liquid Carbon 2 Effluent (LC2)	Liquid Carbon 3 Effluent (LC3)	Treated Effluent (TE)	Treated Effluent (TE) Duplicate
Well Depth		ft	445	530	NA	NA	NA	NA	NA	NA	NA	NA
Screened Interval		ft	335-395 410-430	392-412 442-504	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Date			6/20/13									
Average Flowrate	1100	GPM	789	205	994	NR	991	NR	NR	NR	1,007	NR
Total Flow		gallons	34,070,267	8,855,933	42,926,200	NR	42,801,567	NR	NR	NR	43,484,433	NR
pH	5.5 - 8.5	SU	4.47	4.15	4.40	6.32	6.33	6.24	6.22	6.21	5.94	5.94
Carbon Tetrachloride	NA	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis 1,2-Dichloroethene	5	µg/L	22	ND	17	0.42 J	0.41 J	0.39 J	ND	ND	ND	ND
trans 1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	43	ND	34	0.40 J	0.37 J	ND	ND	ND	ND	ND
1,1,1-Trichloroethene	5	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	µg/L	190	190	190	2.3	2.2	0.52	0.39 J	ND	ND	ND
Vinyl Chloride	2	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercruy	0.25	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Suspended Solids (TSS)	NA	mg/L	ND	ND	ND	ND	ND	7	ND	ND	ND	ND

Notes:
J - Estimated result between laboratory method detection limit and reporting limit
NA - Not Applicable
ND - Not detected above laboratory method detection limit
NR - Not Recorded
gpm - gallons per minute

(1) Influent concentrations presented are the weighted average concentrations of RW-1 and RW-3.
(2) VOCs were analyzed by USEPA Method 524.2 (as opposed to Method 624) to correlate with samples collected under the Bethpage Regional Plume Comprehensive Groundwater Sampling Plan conducted in June 2013.

Table 2
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Air Sampling Results
Second Quarter 2013

DAR Parameters	SGC	Units	April 2013					May 2013				
Process Stream			Influent (VCI1)	VC12	VC23	Effluent	Effluent Duplicate	Influent (VCI1)	VC12	VC23	Effluent	Effluent Duplicate
Sampling Date			4/18/13					5/15/13				
Average Flowrate		CFM	NR	NR	NR	8,029	NR	NR	NR	NR	7,826	NR
Total Flow [(1)]		ft^3	NR	NR	NR	346,842,000	NR	NR	NR	NR	338,083,200	NR
Total Flow [(2)]		m^3	NR	NR	NR	9,821,472	NR	NR	NR	NR	9,573,450	NR
1,2-Dichloroethane	-	$\mu g/m^3$	3.4 J	ND	1.2 J	1.2 J	1.1 J	3.9 J	ND	1.1 J	0.99 J	1.1 J
cis 1,2-Dichloroethene	-	$\mu g/m^3$	260	18	290	18	17	220	4.9	270	17	22
trans 1,2-Dichloroethene	-	$\mu g/m^3$	4.0 J	ND	4.7	ND	ND	4.8 J	ND	4.1	ND	ND
1,2-Dichloroethene (total)	-	$\mu g/m^3$	260	18	290	18	17	220	4.8	270	17	22
Toluene	37000	$\mu g/m^3$	2.6 J	13	14	0.48 J	ND	1.7 J	4.6	1.3 J	4.3	ND
Xylene	4300	$\mu g/m^3$	1.5 J	12	0.96 J	ND	ND	ND	3.3 J	2.1 J	ND	ND
1,1,2-Trichloroethane	-	$\mu g/m^3$	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	14000	$\mu g/m^3$	2700	230	96	15	12	2800	72	120	17	17
Vinyl Chloride	180000	$\mu g/m^3$	9.5	2.0	8.7	0.26 J	0.34 J	9.2	0.66 J	8.4	ND	ND
Tetrachloroethene	1000	$\mu g/m^3$	580	69	26	1.4 J	ND	710	23	ND	ND	ND

Table 2
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Air Sampling Results
Second Quarter 2013

DAR Parameters	SGC	Units	June 2013				
Process Stream			Influent (VCI1)	VC12	VC23	Effluent	Effluent Duplicate
Sampling Date			6/19/13				
Average Flowrate		CFM	NR	NR	NR	7,807	NR
Total Flow [(1)]		ft^3	NR	NR	NR	348,515,640	NR
Total Flow [(2)]		m^3	NR	NR	NR	9,868,864	NR
1,2-Dichloroethane	-	$\mu g/m^3$	3.4 J	ND	1.9 J	1.5 J	2.1 J
cis 1,2-Dichloroethene	-	$\mu g/m^3$	200	11	280	26	22
trans 1,2-Dichloroethene	-	$\mu g/m^3$	3.9 J	ND	4.1	ND	ND
1,2-Dichloroethene (total)	-	$\mu g/m^3$	210	11	280	28	22
Toluene	37000	$\mu g/m^3$	4.5 J	14	0.38 J	0.26 J	0.79 J
Xylene	4300	$\mu g/m^3$	1.9 J	11	ND	ND	ND
1,1,2-Trichloroethane	-	$\mu g/m^3$	2.6 J	ND	ND	ND	ND
Trichloroethene	14000	$\mu g/m^3$	2200	170	150	26	29
Vinyl Chloride	180000	$\mu g/m^3$	7.7	1.7 J	9.1	ND	0.65 J
Tetrachloroethene	1000	$\mu g/m^3$	530	56	1.6 J	1.2 J	ND

Notes:
ND - Not detected
NR - Not recorded
SGC - Short-term Guideline Concentration
$\mu g/m^3$ - micrograms per cubic meter
CFM - cubic feet per minute
DAR - Division of Air Rescources
[(1)] Total Flow (ft^3) = average flowrate (cfm) * operational time (minutes)
[(2)] Total Flow (m^3) = total flow (ft^3) * (0.3048^3)m^3/ft^3

Table 3
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Stack Emissions
Second Quarter 2013

DAR Parameters	Discharge Goal	Units	April 2013	May 2013	June 2013
Sampling Date			4/18/13	5/15/13	6/19/13
Average Flowrate		CFM	8,029	7,826	7,807
Total Flow		ft^3	346,842,000	338,083,200	348,515,640
Total Flow		m^3	9,821,472	9,573,450	9,868,864
Trichloroethene	0.09	lb/hr	0.00045	0.00050	0.00079
Vinyl Chloride	0.01	lb/hr	0.00001	0.00000	0.00000
1,2 Dichloroethene	0.03	lb/hr	0.00054	0.00050	0.00085
1,2-Dichloroethane	BRT	lb/hr	0.00004	0.00003	0.00005
Toluene	BRT	lb/hr	0.00001	0.00013	0.00001
Xylene	BRT	lb/hr	0.00000	0.00000	0.00000
1,1,2-Trichloroethane	BRT	lb/hr	0.00000	0.00000	0.00000
Tetrachloroethene	--	lb/hr	0.00004	0.00000	0.00004

Notes:
BRT - Below reporting thresholds
lb/hr - pounds per hour
DAR - Divison of Air Resources
CFM - Cubic feet per minute
Stack Emissions (lb/hr) = average flowrate (cfm) * $(0.3048^{\wedge 3})m^3/ft^3$ * conc.(ug/m^3) * 1 lb/453592370 ug *
60 min/hr

Table 4
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Level Measurements
Second Quarter 2013

Monitoring Well ID	Date	Well Elevation (ft amsl)	Total Depth (ft)	Screen Interval (ft)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
RW1-MW1	06/17/13	85.86	435	395-435	34.26	51.60
RW1-MW2	06/17/13	87.35	435	395-435	36.85	50.50
RW1-MW3	06/17/13	80.34	435	395-435	27.40	52.94
RW2-MW1	06/17/13	90.75	510	470-510	38.90	51.85
RW2-MW2	06/17/13	90.15	510	470-510	38.88	51.27
RW2-MW3	06/17/13	89.75	510	470-510	38.46	51.29
RW3-MW1	06/17/13	92.22	495	475-495	36.51	55.71
RW3-MW2	06/17/13	91.98	350	330-350	38.86	53.12
RW3-MW3	06/17/13	92.98	340	320-340	37.66	55.32
RW3-MW4	06/17/13	92.92	495	475-495	40.06	52.86
TP-01	06/17/13	85.91	470	450-470	34.06	51.85
IW1-MW1	06/17/13	89.41	150	130-150	34.68	54.73
GM38D	NA	91.37	340	320-340	NA	NA
GM382D	NA	91.57	495	475-495	NA	NA

Notes:
amsl - above mean sea level
ft - feet
NA - Not Available

Table 5
Summary of Final Groundwater Chemistry Data
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Groundwater Chemistry Results
Second Quarter 2013

Location	Temp (ºC)	pH (SU)	S.C. (uS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Color (Visual)
RW1-MW1	22.47	4.58	205	0.50	136.2	2.07	clear
RW1-MW3	14.86	5.11	197	0.25	113.0	3.68	clear
RW2-MW1	15.59	6.20	227	0.17	-34.6	11.8	clear
RW3-MW1	14.63	4.63	143	0.74	206.5	3.90	clear
RW3-MW2	16.58	4.57	91	0.17	206.3	3.21	clear
RW3-MW3	16.47	5.19	159	0.18	138.9	6.13	clear
RW3-MW4	15.15	4.33	184	0.37	226.8	1.70	clear
TP-01	14.93	5.43	190	6.68	113.7	7.58	clear

Notes:
S.C. = Specific Conductance
mS/cm = milliSiemens per centimeter
NTU = nephelometric turbidity units
mg/L = milligrams per liter
ºC = degrees celsius
mV = millivolts
SU = standard units
ORP = oxidation/reduction potential

Table 6
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Detected Groundwater Analytical Results
Second Quarter 2013

Sample ID	RW1-MW1	RW1-MW3	RW2-MW1	RW3-MW1		RW3-MW2	RW3-MW3	RW3-MW4	TP-01
Sample Date	6/19/2013	6/19/2013	6/17/2013	6/20/2013	6/20/2013	6/20/2013	6/21/2013	6/21/2013	6/17/2013
Comments					Duplicate				
VOCS (EPA 524.2) ug/L [(1)]									
1,1,1-trichloroethane	ND	1.8	0.84	ND	ND	ND	ND	0.29 J	0.62
1,1,2,2-tetrachloroethane	ND	0.20 J	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloroethane	ND	0.46 J	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	4.8 J	10	7.0	ND	ND	ND	ND	4.6	3.2
1,1-dichloroethene	ND	1.8	1.9	ND	ND	ND	ND	0.42 J	0.77
1,2-dichloroethane	ND	0.18 J	1.3	ND	ND	ND	ND	0.23 J	0.30 J
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	0.34 J
Chloroform	ND	0.82	2.9	ND	ND	ND	ND	1.2	11
cis-1,2-dichloroethene	64	0.46 J	7.7	ND	ND	ND	ND	ND	8.7
Tetrachloroethene	ND	ND	ND	1.8 J	1.7 J	ND	ND	ND	1.6
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	78	1.7	14	49	48	140	410	1.8	25
Trichlorotrifluoroethane	ND	ND	ND	0.80 J	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury (EPA 245.1) ug/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	ND	ND	13	ND	9.5 J	ND	ND	ND	ND

Notes:

J = estimated value
ND - Not detected above laboratory method detection limit
mg/L = milligrams per liter
µg/L = micrograms per liter

(1) VOCs were analyzed by USEPA Method 524.2 (as opposed to Method 624) in June 2013 to correlate with samples collected under the Bethpage Regional Plume Comprehensive Groundwater Sampling Plan conducted in June 2013.

Samples were analyzed for TCL VOCs. Only those VOCs detected are presented above.

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

Sample ID	RW1-MW1																		
Sample Date	5/4/2005	7/22/2005	5/27/2009	1/21/2010	4/21/2010	7/28/2010	11/10/2010	3/25/2011	6/14/2011[1]	6/14/2011	9/28/2011	11/30/2011	3/8/2012	6/6/2012	6/6/2012	8/21/2012	12/4/2012	3/13/2013	6/19/2013[2]
Comments										Duplicate					Duplicate				
Well Depth (Ft)	435																		
Screened Interval (Ft)	395-435																		
VOCS (EPA 624) ug/L																			
1,1,1-trichloroethane	ND	ND	0.71J	ND	0.52J	0.43J	0.53J	0.79J	ND	0.63 J	1.1 J	0.66 J	0.96 J	0.98 J	0.89 J	0.99 J	0.88 J	1.1	ND
1,1,2,2-tetrachloroethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2-trichloroethane	ND	ND	0.58J	NR	ND	ND	ND	ND	NR	NR	ND	0.33 J	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	0.74J	0.79J	3.3	2.9J	2.8	2.8	3.0	3.6	1.6 J	4.2 J	4.0 J	4.1	5.2	4.8	4.3	5.3	4.9	5.3	4.8 J
1,1-dichloroethene	1.3	2.8	3.1	1.7J	1.9	1.7	1.7	1.9	0.85 J	2.1 J	2.3 J	2.1	2.7	2.5	2.3	2.8	2.0	2.8	ND
1,2,4-trichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromomethane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,2-dichloroethane	ND	ND	0.29J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloropropane	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,4-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,4-dioxane	1.75J	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-butanone	R	R	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
2-hexanone	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
4-methyl-2-pentanone	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Acetone	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	30 R	ND	ND	NR
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	ND	0.32J	ND	ND	ND	0.17J	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	0.7J	1.1	ND	0.70J	0.65J	0.56J	0.55J	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	78.6	80.4	180D	130	121	118	108	121	55.8 J	145 J	164	132	179	165	145	167	108	91.7	64
cis-1,3-dichloropropene	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	NR	NR	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
dichlorodifluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-xylene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
methyl acetate	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methylcyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene chloride	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
methyl-tert-butyl-ether	NR	NR	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
styrene	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Tetrachloroethene	ND	ND	0.72J	ND	0.42J	ND	ND	ND	ND	ND	0.36 J	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	0.33J	0.68	ND	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-dichloroethene	2.0	1.3J	2.8	4J	2.9	2.1	1.3	4.2	0.71 J	2.0 J	2.0 J	1.7	3.0	3.7	2.6	2.4	1.8	1.7	ND
trans-1,3-dichloropropene	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	53.6	52.7	140.0	79.0	116	95.4	84.2	97.6	26.6 J	73.8 J	129	84.5	115	107	102	126	85	101	78
Trichlorofluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
Trichlorotrifluoroethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Vinyl chloride	ND	ND	1.6	ND	ND	ND	0.17J	ND	ND	0.38 J	0.29 J	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mercury (EPA 245.1) ug/L	NR	NR	ND	0.20	<0.20	<0.20	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	NR	NR	2.8	2.8	6.0	4.0	4.0	4.0	ND	6	ND	11	16	9	5	6	ND	ND	ND

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

Sample ID	RW1-MW2				RW1-MW3													
Sample Date	5/4/2005	7/22/2005	5/28/2009	6/18/2013[2]	1/20/2010	4/21/2010	7/29/2010	11/10/2010	3/25/2011	6/14/2011	9/28/2011	11/30/2011	3/8/2012	6/7/2012	8/22/2012	12/7/2012	3/14/2013	6/19/2013[2]
Comments																		
Well Depth (Ft)	435				435													
Screened Interval (Ft)	395-435				395-435													
VOCS (EPA 624) ug/L																		
1,1,1-trichloroethane	1.3	1.0	ND	ND	0.41J	0.98J	ND	0.26J	0.33J	1.6	2.7 J	ND	ND	1.1 J	1.9	1.7	1.4	1.8
1,1,2,2-tetrachloroethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	0.23 J	ND	ND	ND	0.20 J
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2-trichloroethane	ND	0.65J	ND	ND	0.62J	0.60J	0.36J	0.55J	0.41J	NR	0.57 J	0.63 J	0.70 J	0.61 J	0.56 J	0.54 J	0.61 J	0.46 J
1,1-dichloroethane	4.6	5.5	3.4	3.9	2.4	4.6	1.5	2.3	2.4	9.3	10.1 J	2.1	8.4	5.7	9.4	9.3	8.5	10
1,1-dichloroethene	3.2	12.3	ND	ND	0.42J	1.10	ND	0.28J	ND	1.8	2.2 J	ND	1.8	0.86 J	2.4	2.2	1.7	1.8
1,2,4-trichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromomethane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.18 J
1,2-dichloropropane	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dioxane	4.01	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-butanone	R	R	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
2-hexanone	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND
4-methyl-2-pentanone	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Acetone	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	30 R	ND	ND	ND
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	ND	ND	ND	NR	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	1.4	ND	ND	0.67J	0.80J	0.47J	0.69J	0.73J	NR	0.97 J	ND	0.73 J	0.64 J	ND	1.2 J	ND	0.82
Chloromethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	181.0	47.6	160.0	120	0.54J	0.48J	0.36J	0.55J	0.58J	0.59 J	0.43 J	0.55 J	0.68 J	0.33 J	0.56 J	0.46 J	0.53 J	0.46 J
cis-1,3-dichloropropene	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	NR	NR	ND	ND	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
dichlorodifluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-xylene	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
methyl acetate	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methylcyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene chloride	1.0	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
methyl-tert-butyl-ether	NR	NR	ND	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
styrene	ND	ND	ND	NR	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	ND	134.0	19.0	5.9	ND	049J	ND	ND	ND	0.33 J	0.62 J	ND	0.65 J	0.30 J	0.97 J	0.40 J	ND	ND
Toluene	0.32J	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-dichloroethene	2.5	7.6	2.5	1.9 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	158.0	198.0	200.0	64	1.2	1.6	0.58J	0.91J	1.0	1.4	1.8 J	1.0 J	2.2	1.3	2.3	1.6	1.9	1.7
Trichlorofluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Vinyl chloride	12.9	187.0	4.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Mercury (EPA 245.1) ug/L	NR	NR	0.20	NR	NR	<0.20	<0.20	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	NR	NR	4.0	NR	NR	8.0	<4.0	<4.0	<4.0	ND	ND	ND	5	ND	ND	ND	ND	ND

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

Sample ID	RW2-MW1																	RW2-MW2		
Sample Date	5/4/2005	7/20/2005	5/27/2009	1/18/2010	4/21/2010	7/28/2010	11/3/2010	3/24/2011	6/14/2011	9/27/2011	11/29/2011	3/7/2012	6/6/2012	8/21/2012	12/7/2012	3/13/2013	6/17/2013[2]	5/4/2005	7/21/2005	6/17/2013[2]
Comments																				
Well Depth (Ft)	510																	510		
Screened Interval (Ft)	470-510																	470-510		
VOCS (EPA 624) ug/L																				
1,1,1-trichloroethane	ND	0.37J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33 J	ND	ND	0.84	ND	ND	0.34 J
1,1,2,2-tetrachloroethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2-trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	D	ND	ND
1,1-dichloroethane	0.53J	0.93J	1.2J	0.82J	0.60J	0.58J	0.42J	ND	0.61 J	0.64 J	ND	0.50 J	4.2	4.8	0.58 J	0.52 J	7.0	ND	0.78J	4.9
1,1-dichloroethene	ND	0.58J	0.55J	0.63J	ND	ND	ND	ND	ND	ND	ND	ND	0.55 J	0.95 J	0.19 J	ND	1.9	ND	0.41J	0.72
1,2,4-trichlorobenzene	NR	NR	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	NR
1,2-dibromomethane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	NR
1,2-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	0.32 J
1,2-dichloropropane	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
1,4-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
1,4-dioxane	5.34	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	7.45J	NR	NR
2-butanone	R	R	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND	R	R	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
2-hexanone	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND
4-methyl-2-pentanone	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND
Acetone	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	30 R	ND	ND	NR	NR	NR	NR
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
Benzene	ND	ND	ND	ND	0.15J	0.69J	0.58J	0.30J	NR	0.22 J	0.27 J	0.22 J	ND	ND	0.68 J	0.54 J	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	NR
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	0.38 J	ND	ND	ND	2.9	ND	ND	0.55
Chloromethane	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	0.55J	1.9	1.0	0.78J	0.80J	0.55J	0.43J	0.56 J	0.32 J	0.39 J	0.34 J	0.32 J	0.39 J	0.33 J	0.29 J	7.7	0.33J	0.41J	4.6
cis-1,3-dichloropropene	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	NR	NR	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	ND
dichlorodifluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	NR	ND
methyl acetate	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methylcyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene chloride	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
methyl-tert-butyl-ether	NR	NR	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	NR	ND
styrene	ND	ND	ND	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	NR
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	0.85J	1.0	ND	0.52J	0.49J	0.50J	ND	NR	0.24 J	0.29 J	0.19 J	ND	ND	0.27 J	ND	ND	0.33J	0.53J	ND
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	ND	ND	ND	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	37.6	34.6	12.0	15.0	0.42J	ND	ND	1.7	1.6	0.89 J	0.67 J	0.67 J	9.0	20.8	0.73 J	0.67 J	14	7.8	13.8	12
Trichlorofluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	NR	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	1.4J	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	NR
Mercury (EPA 245.1) ug/L	NR	NR	0.05J	NR	<0.20	<0.20	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR
TSS (SM20 2540D) mg/L	NR	NR	2260.0	NR	58.0	<4.0	<4.0	<4.0	181	5	36	6	25	12	10	ND	13	NR	NR	NR

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

Sample ID	RW2-MW3				RW3-MW1															
Sample Date	5/3/2005	7/20/2005	5/28/2009	6/18/2013[2]	1/19/2010	4/22/2010	7/29/2010	11/9/2010	3/25/2011	3/25/2011	6/14/2011	9/27/2011	11/30/2011	11/30/2011	3/7/2012	6/7/2012	8/22/2012	12/6/2012	3/14/2013	6/20/2013[2]	6/20/2013[2]
Comments										Duplicate				Duplicate							Duplicate
Well Depth (Ft)	510				495																
Screened Interval (Ft)	470-510				475-495																
VOCS (EPA 624) ug/L																					
1,1,1-trichloroethane	ND	ND	ND	ND	ND	0.98J	0.84J	1.2	1.1	1.1	0.78 J	1.0 J	0.59 J	0.63 J	0.58 J	0.54 J	0.42 J	0.34 J	0.49 J	ND	ND
1,1,2,2-tetrachloroethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2-trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	0.68J	0.31J	1.4	7.4	1.6	1.5	1.7	1.4	1.3	1.3	1.1	1.0 J	0.96 J	0.93 J	0.90 J	0.80 J	0.87 J	0.98 J	1.2	ND	ND
1,1-dichloroethene	ND	ND	0.42J	ND	1.2	1.3	1.2	1.2	1.2	1.1	0.85 J	0.65 J	0.64 J	0.66 J	0.47 J	0.19 J	0.54 J	0.65 J	0.68 J	ND	ND
1,2,4-trichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromomethane	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR
1,2-dichloroethane	ND	ND	ND	ND	0.27J	ND	ND	ND	ND	ND	ND	0.57 J	ND	ND	0.43 J	ND	ND	0.50 J	ND	ND	ND
1,2-dichloropropane	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR
1,4-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR
1,4-dioxane	7.42J	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-butanone	R	R	ND	ND	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR
2-hexanone	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND
4-methyl-2-pentanone	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND
Acetone	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	30 R	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	30 R	ND	ND	NR	NR
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	0.19J	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	0.20J	ND	ND	NR	ND	ND	ND	ND	ND	ND	0.63 J	ND	ND	ND
Chloromethane	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	0.40J	0.66J	2.3	ND	0.37J	ND	0.32J	0.45J	0.47J	0.45J	0.48 J	0.31 J	0.36 J	0.43 J	0.37 J	0.39 J	0.36 J	0.44 J	0.38 J	ND	ND
cis-1,3-dichloropropene	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	NR	NR	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
dichlorodifluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-xylene	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND
methyl acetate	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methylcyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene chloride	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
methyl-tert-butyl-ether	NR	NR	ND	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND
styrene	ND	ND	ND	NR	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	ND	ND	ND	ND	0.49J	0.81J	0.73J	1.5	1.4	1.6	1.2	1.3 J	1.0	1.1	1.0	0.33 J	ND	0.44 J	1.6	1.8 J	1.7 J
Toluene	ND	0.50J	0.39J	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	0.26 J	ND	ND	ND	ND	ND
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	16.2	20.6	18.0	60	35.0	53.2	52.3	77.6	76.2	77.9	63.1	72.4 J	51.0	55.2	59.0	42.5	37.7	42.8	46.6	49	48
Trichlorofluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR
Trichlorotrifluoroethane	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.80 J	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mercury (EPA 245.1) ug/L	NR	NR	ND	NR	NR	<0.20	<0.20	<0.20	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	NR	NR	14.8	NR	NR	<4.0	<4.0	<4.0	<4.0	<4.0	5160	ND	ND	ND	NR	17	ND	ND	16	ND	9.5 J

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

Sample ID	RW3-MW2																	
Sample Date	1/19/2010	1/19/2010	4/22/2010	7/29/2010	11/9/2010	11/9/2010	3/25/2011	6/14/2011	9/27/2011	11/30/2011	3/8/2012	6/7/2012	8/22/2012	8/22/2012	12/4/2012	12/4/2012	3/14/2013	6/20/2013[2]
Comments		Duplicate			Duplicate									Duplicate		Duplicate		
Well Depth (Ft)	350																	
Screened Interval (Ft)	330-350																	
VOCS (EPA 624) ug/L																		
1,1,1-trichloroethane	ND	ND	0.58J	ND	ND	ND	ND	0.39 J	0.43 J	ND	ND	0.54 J	0.52 J	0.49 J	0.42 J	0.43 J	0.41 J	ND
1,1,2,2-tetrachloroethane	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2-trichloroethane	ND	ND	ND	ND	0.25 J	0.27J	ND	NR	0.32 J	0.32 J	0.32 J	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	ND	ND	0.54J	ND	ND	ND	ND	0.52 J	0.37 J	ND	0.41 J	0.66 J	0.74 J	0.73 J	0.69 J	0.71 J	0.68 J	ND
1,1-dichloroethene	ND	ND	1.2	ND	ND	ND	ND	0.57 J	0.45 J	0.27 J	0.27 J	0.36 J	0.49 J	0.49 J	0.40 J	0.43 J	0.53 J	ND
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromomethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloropropane	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	0.69 J	ND	ND
1,3-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,4-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,4-dioxane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-butanone	NR	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
2-hexanone	NR	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
4-methyl-2-pentanone	NR	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Acetone	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	30 R	30 R	ND	ND	ND	NR
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Benzene	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	NR	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	0.23 J	ND	ND	0.62 J	0.64 J	ND	ND
Chloromethane	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	1.5J	1.6J	2.4	1.1	0.92J	0.92J	1.6	1.7	1.1	1.4	1.3	1.5	1.6	1.5	1.6	1.6	1.6	ND
cis-1,3-dichloropropene	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
dichlorodifluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene chloride	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
methyl-tert-butyl-ether	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
styrene	NR	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28 J	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-dichloroethene	ND	ND	0.43 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	160	170	211	73	58.2	60.9	110	135	151	71.9	96.5	209	198	192	173 J	171	155	140
Trichlorofluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mercury (EPA 245.1) ug/L	NR	NR	<0.20	<0.20	<0.20	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	NR	NR	5.0	6.0	ND	10.0	10.0	7	6	ND	8	ND	ND	ND	ND	ND	ND	ND

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

Sample ID	RW3-MW3															
Sample Date	1/20/2010	4/22/2010	4/22/2010	7/28/2010	11/3/2010 [1]	3/25/2011	6/15/2011	9/28/2011	11/29/2011	3/7/2012	3/7/2012	6/7/2012	8/22/2012	12/4/2012	3/14/2013	6/21/2013[2]
Comments			Duplicate								Duplicate					
Well Depth (Ft)	340															
Screened Interval (Ft)	320-340															
VOCS (EPA 624) ug/L																
1,1,1-trichloroethane	ND	0.95J	1.0J	0.72J	ND	0.62J	1.3	1.0 J	0.49 J	0.84 J	0.87 J	ND	ND	0.85 J	ND	ND
1,1,2,2-tetrachloroethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2-trichloroethane	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	ND	1.6	1.6	2.3	1.0	1.5	7.1	3.2 J	1.5	3.3	3.3	2.6 J	ND	4.2	4.5 J	ND
1,1-dichloroethene	ND	1.1	1.3	1.2	ND	0.96J	2.6	1.8 J	0.96 J	1.9	1.9	1.7 J	1.4 J	1.9	2.1 J	ND
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromomethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloroethane	ND	0.52J	0.54J	ND	ND	ND	0.37 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloropropane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dioxane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-butanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-hexanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
4-methyl-2-pentanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Acetone	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	150 R	ND	ND	ND
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	0.40J	0.46J	ND	0.33J	NR	0.48 J	ND	0.42 J	0.42 J	2.3 J	ND	0.88 J	ND	ND
Chloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	ND	2.1	2.1	1.7	ND	2.3	1.2	1.9	2.1	2.1	2.1	1.4 J	1.8 J	1.2	ND	ND
cis-1,3-dichloropropene	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
dichlorodifluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene chloride	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	3.2 J	ND
methyl-tert-butyl-ether	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
styrene	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	ND	0.45J	0.49J	ND	ND	ND	0.40 J	0.50 J	ND	0.72 J	0.69 J	ND	ND	0.43 J	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	350	397	382	297	8.5	288	331	215 J	250	312	325	285	248	291	347	410
Trichlorofluoromethane	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mercury (EPA 245.1) ug/L	NR	<0.20	<0.20	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	NR	4.0	5.0	<4.0	<4.0	<4.0	ND	ND	ND	ND	ND	13	10	5	ND	ND

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

Sample ID	RW3-MW4														
Sample Date	1/20/2010	4/22/2010	7/28/2010	7/28/2010	11/3/2010 (1)	3/24/2011	6/15/2011	9/28/2011	11/29/2011	3/7/2012	6/7/2012	8/22/2012	12/4/2012	3/14/2013	6/21/2013(2)
Comments				Duplicate											
Well Depth (Ft)	495														
Screened Interval (Ft)	475-495														
VOCS (EPA 624) ug/L															
1,1,1-trichloroethane	ND	ND	ND	ND	0.67J	ND	ND	0.66 J	ND	ND	ND	ND	ND	ND	0.29 J
1,1,2,2-tetrachloroethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2-trichloroethane	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	2.5	0.6	0.54J	0.50J	1.8	0.81	0.78 J	5.4 J	0.84 J	1.8	0.50 J	ND	1.2	3.8	4.6
1,1-dichloroethene	1.0	ND	ND	ND	0.86J	ND	0.20 J	0.53 J	ND	0.21 J	ND	ND	0.19 J	0.38 J	0.42 J
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dibromomethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.23 J
1,2-dichloropropane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR
1,4-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR
1,4-dioxane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-butanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR
2-hexanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND
4-methyl-2-pentanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	ND
Acetone	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	30 R	ND	ND	NR
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR
Benzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	0.32J	ND	NR	0.87 J	ND	0.38 J	ND	ND	0.71 J	ND	1.2
Chloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	0.46J	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-dichloropropene	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dibromochloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
dichlorodifluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene chloride	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
methyl-tert-butyl-ether	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
styrene	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	21	11	7.5	8.0	308	7.7	6.7	3.4 J	5.6	4.6	5.4	5.5	4.5	2.3	1.8
Trichlorofluoromethane	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mercury (EPA 245.1) ug/L	NR	<0.20	<0.20	<0.20	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	NR	16.0	<4.0	<4.0	<4.0	<4.0	ND	11	6	5	ND	ND	ND	22	ND

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through Second Quarter 2013

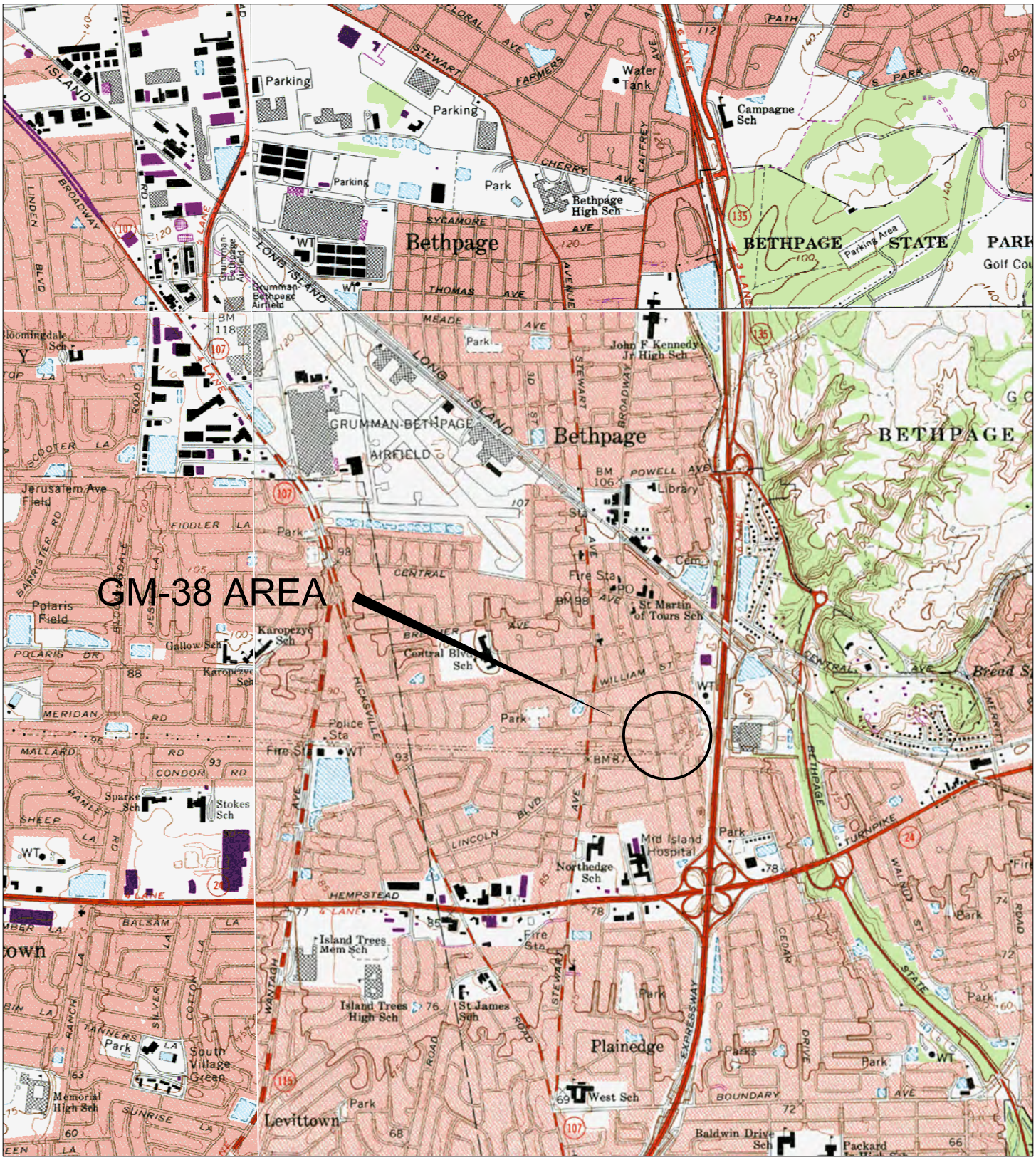
Sample ID	TP-01												IW-1 MW-1		IW-1
Sample Date	1/21/2010	6/15/2011	9/27/2011	9/27/2011	11/30/2011	3/8/2012	6/6/2012	8/22/2012	12/4/2012	3/13/2013	3/13/2013	6/17/2013[2]	5/3/2005	6/18/2013[2]	5/27/2009
Comments				Duplicate							Duplicate				
Well Depth (Ft)	470												150		230
Screened Interval (Ft)	470-510												130-150		200-230
VOCS (EPA 624) ug/L															
1,1,1-trichloroethane	ND	0.63 J	0.73 J	0.76 J	0.29 J	0.57 J	1.1 J	0.86 J	ND	0.35 J	0.35 J	0.62	0.47	0.92	0.49J
1,1,2,2-tetrachloroethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
1,1,2-trichloroethane	ND	NR	0.31 J	0.31 J	0.32 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethane	3.6J	5.0	3.7	3.7	2.9	3.7	3.7	3.4	1.1	1.5	1.4	3.2	0.39J	0.51	0.22J
1,1-dichloroethene	ND	1.7	1.1	1.0	1.0	1.2	1.4	1.1	0.23 J	0.44 J	0.42 J	0.77	ND	ND	ND
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
1,2-dibromo-3-chloro-propane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	ND
1,2-dibromomethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	ND
1,2-dichlorobenzene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	ND
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	0.35 J	0.36 J	0.37 J	0.30 J	ND	ND	ND
1,2-dichloropropane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	ND
1,4-dichlorobenzene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	ND
1,4-dioxane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
2-butanone	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	R	ND	ND
2-chloroethylvinyl ether	NR	NR	ND	ND	ND	ND	ND	ND	ND	2.0 R	2.0 R	NR	NR	NR	NR
2-hexanone	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND
4-methyl-2-pentanone	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND
Acetone	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	NR	NR	ND	ND	ND	ND	ND	30 R	ND	ND	ND	NR	NR	NR	NR
Acrylonitrile	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR
Benzene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34 J	ND	ND	ND
Bromoform	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	ND
Carbon tetrachloride	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	NR	0.68 J	0.74 J	ND	0.74 J	0.82 J	ND	2.5 J	1.2	1.1	11	0.94J	ND	0.98J
Chloromethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	190	43.4	40.4	40.2	74.9	53.3	29.9	16.1	4.2	5.8	5.8	8.7	ND	ND	ND
cis-1,3-dichloropropene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Dibromochloromethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND
dichlorodifluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Ethylbenzene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	ND	ND
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND
Methylene chloride	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
methyl-tert-butyl-ether	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.46J
o-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	ND	ND
styrene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	ND
Tetrachloroethene	3.4J	3.3	4.4	4.4	3.6	4.7	6.0	4.0	0.42 J	0.34 J	0.32 J	1.6	ND	0.55	ND
Toluene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19J
trans-1,2-dichloroethene	3.0J	1.1	1.0 J	0.92 J	1.1	0.87 J	0.79 J	0.35 J	ND	ND	ND	ND	ND	ND	ND
trans-1,3-dichloropropene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	65	35.3	41.0	39.6	38.0	38.1	40.4	27.9	22.0	25.9	25.4	25	ND	ND	0.17J
Trichlorofluoromethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	ND
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	NR	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	ND
Mercury (EPA 245.1) ug/L	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	0.20
TSS (SM20 2540D) mg/L	NR	63	18	NR	ND	7	6	ND	ND	ND	ND	ND	NR	NR	2.4

Note:
VOC analysis changed from SW846 8260B to EPA Method 624 in January 2010.
D = Dilution
J = estimated value
ND = not detected
NR = not reported / required
R = rejected
mg/L - milligrams per liter
µg/L - micrograms per liter

(1) Analytical results presented above for samples collected from RW3-MW3 and RW3-MW4 in November 2010 are not consistent with historical trends, indicating samples may have been switched. For trend analysis, concentrations for RW3-MW3 were used for RW3-MW4 for November 2010 and vise versa.
(2) VOCs were analyzed by USEPA Method 524.2 (as opposed to Method 624) in June 2013 to correlate with samples collected under the Bethpage Regional Plume Comprehensive Groundwater Sampling Plan conducted in June 2013.

Data prior to June 2011 were collected by others.

FIGURES



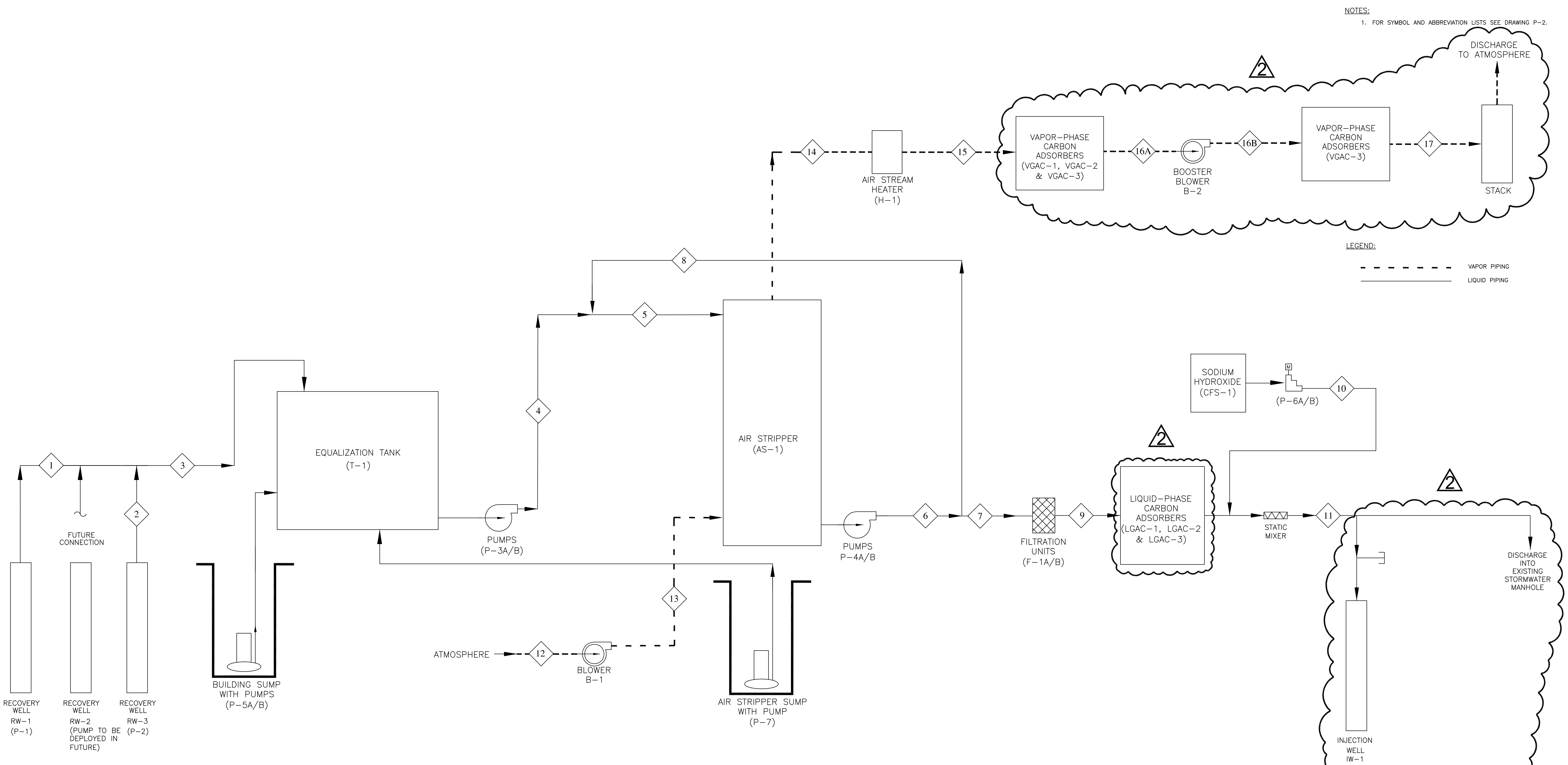
Source: U.S.G.S. Topographic Maps (7.5 Minute)
Amityville, Freeport, Hicksville, Huntington, NY Quadrangles

U.S. Navy RAC
Engineering Field Activity, Northeast

GM-38 Area (Offsite)
NWIRP Bethpage
Bethpage, NY

Figure 1
Site Location Map

P:\LantDiv\Bethpage\CAD - GIS\Dwg\O&M Manual\Site Location Map.dwg, 6/29/2009 3:33:52 PM



STREAM NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COMPOSITION (UG/L, UNLESS OTHERWISE NOTED)																
BENZENE	4	4	4	4	3	-	-	-	-		-					
TOLUENE	15	15	15	15	12	-	-	-	-		-					
XYLENES, TOTAL	16	16	16	16	12	-	-	-	-		-					
1,2-DICHLOROETHANE	3	3	3	3	2.8						2.7 E-07					
cis 1,2-DICHLOROETHENE	1100	1100	1100	1100	1008	0.10	0.10	0.10	0.10		1.0 E-04					
VINYL CHLORIDE	300	300	300	300	275	0.03	0.03	0.03	0.03		2.7 E-05					
TETRACHLOROETHENE (PCE)	900	900	900	900	825	0.08	0.08	0.08	0.08		8.2 E-05					
TRICHLOROETHENE (TCE)	3400	3400	3400	3400	3117	3.12	3.12	3.12	3.12		3.1 E-03					
WATER FLOW RATE (GPM)	800	300	1100	1100	1200	1200	1100	100	1100	1.1 gpd	1100					
TEMPERATURE (°F)	55	55	55	55	55	55	55	55	55	60	55					
PRESSURE (PSIG)												-0.27	1.50	1.36	1.18	0.53
DENSITY (lb/ft^3)										95.5		0.077	0.085	0.084	0.082	0.079
MASS FLOW RATE (lb/hr)	400364	150136	550500	550500	600545	600545	550500	50,045	550500	0.59	550500	36,960	40,800	40,320	39,360	37,920
RELATIVE HUMIDITY (%)												50	50	100	50	50
STATIC PRESSURE (PSIA)												0.214	0.214	0.214	0.275	0.275
pH (S.U.)	5.5	5.5	5.5	5.5	5.5	6.0	6.0	6.0	6.0	14	7.0					
VAPOR FLOW RATE (CFM)												8000	8000	8000	8000	8000
TOTAL VAPOR VOC (PPMV)												-	-	25.5	25.5	1.2
TOTAL VAPOR VOC (LBS/HR)												-	-	3.18	3.18	0.15

THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY

SAT TO DATE 05/05/06
CODE I.D. NO. 80091
SCALE : AS SHOWN
SPEC. NO.
CONSTRN. CONTR. NO. N62472-99-D-0032
NAVFAC DRAWING NO. Figure 2
SHEET OF
SIZE: D DIS. SH. NO. 1-4

Legend

- Monitoring Well (Monitored by Navy)
- Monitoring Well (Monitored by Northrop Grumman)
- Recovery Well
- Injection Well

SOPHIA STREET
NORTH WINDHORST
NORTH HERMAN AVENUE
LEROY AVENUE
ARTHUR AVENUE
MAIN STREET (BROADWAY)
SOUTH WINDHORST
SOUTH HERMAN AVENUE
WILSON LANE
(SEAFORD-OYSTER BAY EXPRESSWAY - RTE 135)
RECHARGE BASIN
GROUNDWATER TREATMENT PLANT

RW3-MW-4
RW3-MW-3
RW3-MW-1
RW3-MW-2
RW3-3
GM-38D
GM-38D-2
RW2-MW-1
RW2-MW-2
RW2-MW-3
RW-2
TP-1
RW1-MW-3
RW1-MW-2
RW1-MW-1
RW-1
IW-1
IW1-MW-1

0 160
APPROXIMATE SCALE IN FEET

SITE MAP

NWIRP BETHPAGE GM-38 AREA
BETHPAGE, NEW YORK

H&S Environmental, Inc.
160 East Main Street, Suite 2F, Westborough, MA 01581

SCALE	DATE	FIGURE
SEE BARSCALE	4/12/2012	3

X:\HS_Environmental\NWIRP-NY\As-Built 2008-PM.dwg 4/12/2012

RW3-MW4	6/21/2013
cis-1,2-DCE	ND
PCE	ND
TCE	1.8
VC	ND

RW3-MW3	6/21/2013
cis-1,2-DCE	ND
PCE	ND
TCE	410
VC	ND

RW3-MW1	6/20/2013	6/20/2013 - DUP
cis-1,2-DCE	ND	ND
PCE	1.8 J	1.7 J
TCE	49	48
VC	ND	ND

RW3-MW2	6/20/2013
cis-1,2-DCE	ND
PCE	ND
TCE	140
VC	ND

TP-01	6/17/2013
cis-1,2-DCE	8.7
PCE	1.6
TCE	25
VC	ND

RW1-MW3	6/19/2013
cis-1,2-DCE	0.46 J
PCE	ND
TCE	1.7
VC	ND

RW2-MW1	6/17/2013
cis-1,2-DCE	7.7
PCE	ND
TCE	14
VC	ND

RW-3	4/8/2013	5/15/2013	6/20/2013
cis-1,2-DCE	1.8	1.9 J	ND
PCE	0.38 J	ND	ND
TCE	211	241	190
VC	ND	ND	ND

RW1-MW1	6/19/2013
cis-1,2-DCE	64
PCE	ND
TCE	78
VC	ND

RW-1	4/8/2013	5/15/2013	6/20/2013
cis-1,2-DCE	30.4	25.5	22
PCE	63.0	60.2	43
TCE	212	239	190
VC	ND	1.5 J	ND

SOPHIA STREET
NORTH WINDHORST
NORTH HERMAN AVENUE
LEROY AVENUE
ARTHUR AVENUE
RECHARGE BASIN
SOUTH HERMAN AVENUE
SOUTH WINDHORST
MAIN STREET (BROADWAY)
WILSON LANE
(SEAFORD-OYSTER BAY EXPRESSWAY - RTE 135)
GROUNDWATER TREATMENT PLANT

RW3-MW4
RW3-MW3
RW3-MW1
RW3-MW2
RW2-MW1
RW2-MW2
RW2-MW3
RW-2
RW-3
GM-38D
GM-38D2
TP-1
RW1-MW3
RW1-MW2
RW1-MW1
RW-1
IW-1
IW1-MW1

Legend

- Monitoring Well (Monitored by Navy)
- Monitoring Well (Monitored by Northrop Grumman)
- Recovery Well
- Injection Well
- J Estimated value
- ND Not Detected above laboratory method detection limit
- DCE Dichloroethene
- PCE Tetrachloroethane
- TCE Trichloroethane
- VC Vinyl Chloride

Notes:
All concentrations reported in µg/L.

Monitoring wells were sampled on a quarterly basis. Recovery wells RW-1 and RW-3 were sampled on a monthly basis.

0 160
APPROXIMATE SCALE IN FEET

2nd QUARTER 2013
GROUNDWATER ANALYTICAL MAP
SELECT VOC CONCENTRATIONS

NWIRP BETHPAGE GM-38 AREA
BETHPAGE, NEW YORK

H&S Environmental, Inc.
160 East Main Street, Suite 2F, Westborough, MA 01581

SCALE	DATE	FIGURE
SEE BARSCALE	12/10/2013	4

APPENDIX A

NYSDEC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS AND MONTHLY DMRS

New York State Department of Environmental Conservation
Division of Water
Bureau of Water Permits, 4th Floor
625 Broadway, Albany, New York 12233-3505
Phone: (518) 402-8111 • **FAX:** (518) 402-9029
Website: www.dec.state.ny.us

Alexander B. Grannis
Commissioner

MEMORANDUM

TO: Steven Scharf, DER

FROM: Jean Occidental, DOW, Bureau of Water Permits JO

SUBJECT: Naval Weapons Industrial Reserve Plant (NWIRP); DER Site # 1-01-001

DRAINAGE BASIN: na

DATE: June 6, 2008

In response to your request and the permittee's SPDES Permit Equivalent Application dated April 27, 2008, attached is the effluent criteria for the above noted groundwater remediation discharge.

The Division of Water does not have any regulatory authority over a discharge from a State, PRP, or Federal Superfund Site. The Division of Environmental Remediation will be responsible for ensuring compliance with the attached effluent criteria and approval of all engineering submissions. Additional Condition (1) identifies the contact to send all effluent results, engineering submissions, and modification requests. The Regional Water Engineer should be kept appraised of the status of these discharges and, in accordance with the attached criteria, receive a copy of the effluent results for informational purposes.

If you have any questions, please call me at (518) 402-8116.

Attachment

cc: (w/att) RWE, Region 1
C. Webber
BWP Permit Coordinator

Naval Weapons Industrial Reserve Plant

DER site # 1-01-001
Page 1 of 2

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning: April 1, 2009

and lasting until: April 1, 2014

the discharges from the treatment facility to Groundwater shall be limited and monitored by the operator as specified below:

Outfall and Parameters	Limitations		Units	Minimum Monitoring Requirements	
	Daily Avg.	Daily Max.		Measurement Frequency	Sample Type
Treated Groundwater Remediation Discharge from: Recovery Wells 1, 2, and 3					
Flow	Monitor	1100	GPM	Continuous	Recorder
pH (range)	5.5 - 8.5		SU	Weekly	Grab
1,1-Dichloroethane	NA	5	µg/l	Monthly [1]	Grab
1,2-Dichloroethane	NA	0.6	µg/l	Monthly [1]	Grab
1,1-Dichloroethene	NA	5	µg/l	Monthly [1]	Grab
cis-1,2-Dichloroethene	NA	5	µg/l	Monthly [1]	Grab
trans-1,2-Dichloroethene	NA	5	µg/l	Monthly [1]	Grab
Tetrachloroethene	NA	5	µg/l	Monthly [1]	Grab
1,1,1-Trichloroethane	NA	5	µg/l	Monthly [1]	Grab
Trichloroethene	NA	5	µg/l	Monthly [1]	Grab
Vinyl chloride	NA	2	µg/l	Monthly [1]	Grab
Mercury	NA	0.25	µg/l	Monthly [1]	Grab

Footnotes:

(1) The minimum measurement frequency shall be monthly following a period of 24 consecutive weekly sampling events showing no exceedances of the stated discharge limitations.

Additional Conditions:

(1) Discharge is not authorized until such time as an engineering submission showing the method of treatment is approved by the Department. The discharge rate may not exceed the effective or design treatment system capacity. All monitoring data, engineering submissions and modification requests must be submitted to:

Steven Scharf
Division of Environmental Remediation
NYSDEC, 625 Broadway
Albany, NY 12233-7015
Phone: (518) 402-9620

With a copy sent to:

Regional Water Engineer
NYSDEC - Region 1
Building 40, SUNY Campus
Stony Brook, New York 11790-2356
Phone: (631) 444-0354

(2) Only site generated wastewater is authorized for treatment and discharge.

(3) Authorization to discharge is valid only for the period noted above but may be renewed if appropriate. A request for renewal must be received 6 months prior to the expiration date to allow for a review of monitoring data and reassessment of monitoring requirements.

(4) Any use of corrosion/scale inhibitors, biocidal-type compounds, or other water treatment chemicals used in the treatment process must be approved by the department prior to use.

(5) This discharge and administration of this discharge must comply with the substantive requirements of 6NYCRR Part 750.

APRIL 2013

H&S ENVIRONMENTAL
...an 8(a), SDB, woman-owned company

13 May 2013

Mr. Steven Scharf
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Action, Bureau A
625 Broadway
Albany, NY 12233-7015

Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2 APRIL 2013 REPORTING PERIOD

Dear Mr. Scharf:

H&S Environmental, Inc. (H&S) is submitting this monthly monitoring report of the groundwater discharge and air emission results for the Groundwater Treatment Plant (GWTP) located at the Former Naval Industrial Reserve Plant (NWIRP), Bethpage, NY, GM-38 Area. This report was prepared in accordance with GWTP operational requirements for DER Site # 1-30-003B-OU 2.

GWTP operational data from 1 April 2013 to 30 April 2013 are presented in Attachment A. During this reporting period, no unscheduled downtime occurred. Scheduled downtime and /or reduced overall influent flowrates occurred on 1-15 April 2013 for performance of pump test activities. This resulted in lower than average flowrates during the April 2013 reporting period.

As indicated in Attachment A, all permitted constituents were in compliance with regulatory guidelines during this reporting period.

Please contact me at 508-366-7442 with any questions or concerns you may have regarding this report.

Sincerely,
H&S Environmental, Inc.

Jennifer Good, P.G.
Project Manager

Attachment A: Groundwater and Air Sampling Results from April 2013

Cc: Jean Occidental - NYSDEC Division of Water
William Spitz - NYSDEC – Region 1 Water Engineer
Gerard Ennis - Nassau County Department of Public Works
Linda Bianculli - Town of Oyster Bay
Lora Fly - NAVFAC Mid-Atlantic RPM
Al Taormina – H&S
GM-38 Copy

ATTACHMENT A

GROUNDWATER AND AIR SAMPLING RESULTS

APRIL 2013

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
April 2013

SPDES Parameters	April 2013					
Process Stream	Daily Treated Effluent Maximum	Units	RW-1	RW-3	Combined Influent [(1)] (RW-1 + RW-3)	Treated Effluent
Well Depth	N/A	ft	445	530	N/A	N/A
Screened Interval	N/A	ft bgs	335-395 410-430	392-412 442-504	N/A	N/A
Sampling Date	N/A		4/18/13			
Average Flowrate	1100	GPM	497	126	623	647
Total Flow	N/A	gallons	21,454,800	5,454,100	26,908,900	27,932,000
pH	5.5 - 8.5	SU	4.72	4.66	4.71	6.01
Carbon Tetrachloride	NA	µg/L	0.34 J	ND	0.27 J	ND
1,1-Dichloroethane	5	µg/L	2.7	2.6	2.7	ND
1,2-Dichloroethane	0.6	µg/L	0.45 J	ND	0.36 J	ND
1,1-Dichloroethene	5	µg/L	3.7	1.9	3.3	ND
cis 1,2-Dichloroethene	5	µg/L	30.4	1.8	24.6	ND
trans 1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	63.0	0.38 J	50.2 J	ND
1,1,1-Trichloroethene	5	µg/L	3.5	1.1	2.8	ND
Trichloroethene	5	µg/L	212	211	212	ND
Vinyl Chloride	2	µg/L	ND	ND	ND	ND
Mercury	0.25	µg/L	ND	ND	ND	ND
Total Suspended Solids (TSS)	N/A	mg/L	ND	ND	ND	ND

Notes:
J - Estimated result between laboratory method detection limit and reporting limit
ND - Not detected above laboratory method detection limit
N/A - Not Applicable
(1) Influent concentrations presented are the weighted average concentrations of RW-1 and RW-3.

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
April 2013

DAR Parameters	Units	SGC	April 2013	
Process Stream			Influent	Effluent
Sampling Date	N/A	N/A	4/18/13	
Average Flowrate	CFM	N/A	NR	8,029
Total Flow	ft^3	N/A	NR	346,842,000
Total Flow	m^3	N/A	NR	9,821,472
1,2-Dichloroethane	$\mu g/m^3$	N/A	3.4 J	1.2 J
cis 1,2-Dichloroethene	$\mu g/m^3$	N/A	260	18
trans 1,2-Dichloroethene	$\mu g/m^3$	N/A	4.0 J	ND
1,2-Dichloroethene (total)	$\mu g/m^3$	N/A	260	18
Toluene	$\mu g/m^3$	37,000	2.6 J	0.48 J
Total Xylene	$\mu g/m^3$	4,300	1.5 J	ND
1,1,2-Trichloroethane	$\mu g/m^3$	N/A	ND	ND
Trichloroethene	$\mu g/m^3$	14,000	2700	15
Vinyl Chloride	$\mu g/m^3$	180,000	9.5	0.26 J
Tetrachloroethene	$\mu g/m^3$	1,300	580	1.4 J

Notes:
CFM - cubic feet per minute
DAR - Division of Air Resources
J - Estimated result between laboratory method detection limit and reporting limit
N/A - Not Applicable
NR - Not recorded
SGC - Short-term Guideline Concentration

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
April 2013

DAR Parameters	Units	Discharge Goal	April 2013
Sampling Date	N/A	N/A	4/18/13
Average Flowrate	CFM	N/A	8,029
Total Flow	ft^3	N/A	346,842,000
Total Flow	m^3	N/A	9,821,472
Trichloroethene	lb/hr	0.09	0.00045
Vinyl Chloride	lb/hr	0.01	0.00001
1,2 Dichloroethene	lb/hr	0.03	0.00054
1,2-Dichloroethane	lb/hr	BRT	0.00004
Toluene	lb/hr	BRT	0.00001
Total Xylene	lb/hr	BRT	0.00000
1,1,2-Trichloroethane	lb/hr	BRT	0.00000
Tetrachloroethene	lb/hr	0.02	0.00004

Notes:
BRT - below reporting thresholds
CFM - cubic feet per minute
DAR - Division of Air Resources
N/A - Not Applicable

MAY 2013

H&S ENVIRONMENTAL
...an 8(a), SDB, woman-owned company

12 June 2013

Mr. Steven Scharf
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Action, Bureau A
625 Broadway
Albany, NY 12233-7015

Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2 May 2013 REPORTING PERIOD

Dear Mr. Scharf:

H&S Environmental, Inc. (H&S) is submitting this monthly monitoring report of the groundwater discharge and air emission results for the Groundwater Treatment Plant (GWTP) located at the Former Naval Industrial Reserve Plant (NWIRP), Bethpage, NY, GM-38 Area. This report was prepared in accordance with GWTP operational requirements for DER Site # 1-30-003B-OU 2.

GWTP operational data from 1 May 2013 to 31 May 2013 are presented in Attachment A. During this reporting period, unscheduled downtime occurred on 25 May 2013 due to heavy rains in the area. Scheduled downtime occurred on 8 May 2013 for performance of maintenance on the liquid-phase granular activated carbon units. Both unscheduled and scheduled downtime affected the average flowrates during the May 2013 reporting period.

As indicated in Attachment A, all permitted constituents were in compliance with regulatory guidelines during this reporting period.

Please contact me at 508-366-7442 with any questions or concerns you may have regarding this report.

Sincerely,
H&S Environmental, Inc.

Jennifer Good, P.G.
Project Manager

Attachment A: Groundwater and Air Sampling Results from May 2013

Cc: Jean Occidental - NYSDEC Division of Water
William Spitz - NYSDEC – Region 1 Water Engineer
Gerard Ennis - Nassau County Department of Public Works
Linda Bianculli - Town of Oyster Bay
Lora Fly - NAVFAC Mid-Atlantic RPM
Al Taormina – H&S
GM-38 Copy

ATTACHMENT A

GROUNDWATER AND AIR SAMPLING RESULTS

MAY 2013

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
May 2013

SPDES Parameters	May 2013					
Process Stream	Daily Treated Effluent Maximum	Units	RW-1	RW-3	Combined Influent [(1)] (RW-1 + RW-3)	Treated Effluent
Well Depth	N/A	ft	445	530	N/A	N/A
Screened Interval	N/A	ft bgs	335-395 410-430	392-412 442-504	N/A	N/A
Sampling Date	N/A		5/15/13			
Average Flowrate	1100	GPM	736	193	929	970
Total Flow	N/A	gallons	32,849,233	8,599,067	41,448,300	43,299,167
pH	5.5 - 8.5	SU	4.56	4.74	4.60	5.94
Carbon Tetrachloride	NA	µg/L	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	2.8 J	2.4 J	2.7 J	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	4.6 J	2.0 J	4.1 J	ND
cis 1,2-Dichloroethene	5	µg/L	25.5	1.9 J	20.6 J	0.31 J
trans 1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	60.2	ND	47.7	ND
1,1,1-Trichloroethene	5	µg/L	3.2 J	ND	2.5 J	ND
Trichloroethene	5	µg/L	239	241	239	ND
Vinyl Chloride	2	µg/L	1.5 J	ND	1.2 J	ND
Mercury	0.25	µg/L	ND	ND	ND	ND
Total Suspended Solids (TSS)	N/A	mg/L	ND	7	1	ND

Notes:
J - Estimated result between laboratory method detection limit and reporting limit
ND - Not detected above laboratory method detection limit
N/A - Not Applicable
(1) Influent concentrations presented are the weighted average concentrations of RW-1 and RW-3.

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
May 2013

DAR Parameters	Units	SGC	May 2013	
Process Stream			**Influent**	**Effluent**
Sampling Date	N/A	N/A	5/15/13	
Average Flowrate	CFM	N/A	NR	7,826
Total Flow	ft^3	N/A	NR	338,083,200
Total Flow	m^3	N/A	NR	9,573,450
1,2-Dichloroethane	$\mu g/m^3$	N/A	3.9 J	0.99 J
cis 1,2-Dichloroethene	$\mu g/m^3$	N/A	220	17
trans 1,2-Dichloroethene	$\mu g/m^3$	N/A	4.8 J	ND
1,2-Dichloroethene (total)	$\mu g/m^3$	N/A	220	17
Toluene	$\mu g/m^3$	37,000	1.7 J	4.3
Total Xylene	$\mu g/m^3$	4,300	ND	ND
1,1,2-Trichloroethane	$\mu g/m^3$	N/A	ND	ND
Trichloroethene	$\mu g/m^3$	14,000	2800	17
Vinyl Chloride	$\mu g/m^3$	180,000	9.2	ND
Tetrachloroethene	$\mu g/m^3$	1,300	710	ND

Notes:
CFM - cubic feet per minute
DAR - Division of Air Resources
J - Estimated result between laboratory method detection limit and reporting limit
N/A - Not Applicable
NR - Not recorded
SGC - Short-term Guideline Concentration

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
May 2013

DAR Parameters	Units	Discharge Goal	May 2013
Sampling Date	N/A	N/A	5/15/13
Average Flowrate	CFM	N/A	7,826
Total Flow	ft^3	N/A	338,083,200
Total Flow	m^3	N/A	9,573,450
Trichloroethene	lb/hr	0.09	0.00050
Vinyl Chloride	lb/hr	0.01	0.00000
1,2 Dichloroethene	lb/hr	0.03	0.00050
1,2-Dichloroethane	lb/hr	BRT	0.00003
Toluene	lb/hr	BRT	0.00013
Total Xylene	lb/hr	BRT	0.00000
1,1,2-Trichloroethane	lb/hr	BRT	0.00000
Tetrachloroethene	lb/hr	0.02	0.00000

Notes:
BRT - below reporting thresholds
CFM - cubic feet per minute
DAR - Division of Air Resources
N/A - Not Applicable

JUNE 2013

H&S ENVIRONMENTAL
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23 July 2013

Mr. Steven Scharf
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Action, Bureau A
625 Broadway
Albany, NY 12233-7015

Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2 JUNE 2013 REPORTING PERIOD

Dear Mr. Scharf:

H&S Environmental, Inc. (H&S) is submitting this monthly monitoring report of the groundwater discharge and air emission results for the Groundwater Treatment Plant (GWTP) located at the Former Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY, GM-38 Area. This report was prepared in accordance with GWTP operational requirements for DER Site # 1-30-003B-OU 2.

GWTP operational data from 1 June 2013 to 30 June 2013 are presented in Attachment A. During this reporting period, unscheduled downtime occurred on 8 June 2013 and 10 June 2013 due to heavy rains in the area. Scheduled downtime occurred on 5 June 2013 for performance of maintenance on the bag filter units. Both unscheduled and scheduled downtime affected the average flowrates during the June 2013 reporting period.

As indicated in Attachment A, all permitted constituents were in compliance with regulatory guidelines during this reporting period.

Please contact me at 508-366-7442 with any questions or concerns you may have regarding this report.

Sincerely,
H&S Environmental, Inc.

Jennifer Good, P.G.
Project Manager

Attachment A: Groundwater and Air Sampling Results from June 2013

Cc: Jean Occidental - NYSDEC Division of Water
William Spitz - NYSDEC – Region 1 Water Engineer
Gerard Ennis - Nassau County Department of Public Works
Linda Bianculli - Town of Oyster Bay
Lora Fly - NAVFAC Mid-Atlantic RPM
Al Taormina – H&S
GM-38 Copy

ATTACHMENT A

GROUNDWATER AND AIR SAMPLING RESULTS

JUNE 2013

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
June 2013

SPDES Parameters	June 2013 [2]					
Process Stream	Daily Treated Effluent Maximum	Units	RW-1	RW-3	Combined Influent [1] (RW-1 + RW-3)	Treated Effluent
Well Depth	N/A	ft	445	530	N/A	N/A
Screened Interval	N/A	ft bgs	335-395 410-430	392-412 442-504	N/A	N/A
Sampling Date	N/A		6/20/13			
Average Flowrate	1100	GPM	789	205	994	1,007
Total Flow	N/A	gallons	34,070,267	8,855,933	42,926,200	43,484,433
pH	5.5 - 8.5	SU	4.47	4.15	4.40	5.94
Carbon Tetrachloride	NA	µg/L	ND	ND	ND	ND
1,1-Dichloroethane	5	µg/L	ND	ND	ND	ND
1,2-Dichloroethane	0.6	µg/L	ND	ND	ND	ND
1,1-Dichloroethene	5	µg/L	ND	ND	ND	ND
cis 1,2-Dichloroethene	5	µg/L	22	ND	17	ND
trans 1,2-Dichloroethene	5	µg/L	ND	ND	ND	ND
Tetrachloroethene	5	µg/L	43	ND	34	ND
1,1,1-Trichloroethene	5	µg/L	ND	ND	ND	ND
Trichloroethene	5	µg/L	190	190	190	ND
Vinyl Chloride	2	µg/L	ND	ND	ND	ND
Mercury	0.25	µg/L	ND	ND	ND	ND
Total Suspended Solids (TSS)	N/A	mg/L	ND	ND	ND	ND

Notes:
J - Estimated result between laboratory method detection limit and reporting limit
ND - Not detected above laboratory method detection limit
N/A - Not Applicable
(1) Influent concentrations presented are the weighted average concentrations of RW-1 and RW-3.
(2) VOCs were analyzed by USEPA Method 524.2 (as opposed to Method 624) to correlate with samples collected under the Bethpage Regional Plume Comprehensive Groundwater Sampling Plan conducted in June 2013.

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
June 2013

DAR Parameters	Units	SGC	June 2013	
Process Stream			**Influent**	**Effluent**
Sampling Date	N/A	N/A	6/19/13	
Average Flowrate	CFM	N/A	NR	7,807
Total Flow	ft^3	N/A	NR	348,515,640
Total Flow	m^3	N/A	NR	9,868,864
1,2-Dichloroethane	$\mu g/m^3$	N/A	3.4 J	1.5 J
cis 1,2-Dichloroethene	$\mu g/m^3$	N/A	200	26
trans 1,2-Dichloroethene	$\mu g/m^3$	N/A	3.9 J	ND
1,2-Dichloroethene (total)	$\mu g/m^3$	N/A	210	28
Toluene	$\mu g/m^3$	37,000	4.5 J	0.26 J
Total Xylene	$\mu g/m^3$	4,300	1.9 J	ND
1,1,2-Trichloroethane	$\mu g/m^3$	N/A	2.6 J	ND
Trichloroethene	$\mu g/m^3$	14,000	2200	26
Vinyl Chloride	$\mu g/m^3$	180,000	7.7	ND
Tetrachloroethene	$\mu g/m^3$	1,300	530	1.2 J

Notes:
CFM - cubic feet per minute
DAR - Division of Air Resources
J - Estimated result between laboratory method detection limit and reporting limit
N/A - Not Applicable
NR - Not recorded
SGC - Short-term Guideline Concentration

GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
June 2013

DAR Parameters	Units	Discharge Goal	June 2013
Sampling Date	N/A	N/A	6/19/13
Average Flowrate	CFM	N/A	7,807
Total Flow	ft^3	N/A	348,515,640
Total Flow	m^3	N/A	9,868,864
Trichloroethene	lb/hr	0.09	0.00079
Vinyl Chloride	lb/hr	0.01	0.00000
1,2 Dichloroethene	lb/hr	0.03	0.00085
1,2-Dichloroethane	lb/hr	BRT	0.00005
Toluene	lb/hr	BRT	0.00001
Total Xylene	lb/hr	BRT	0.00000
1,1,2-Trichloroethane	lb/hr	BRT	0.00000
Tetrachloroethene	lb/hr	0.02	0.00004

Notes:
BRT - below reporting thresholds
CFM - cubic feet per minute
DAR - Division of Air Resources
N/A - Not Applicable

APPENDIX B

NYSDEC AIR PERMIT EQUIVALENT APPROVAL

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Remedial Action A
625 Broadway, 11th Floor
Albany, New York 12233-7015
Phone: (518) 402-9625 • Fax: (518) 402-9022
Website: www.dec.state.ny.us

Alexander P. Grannis
Commissioner

July 24, 2009

Lora Fly, Project Manager
Naval Facilities Engineering Command-Midlant
9742 Maryland Avenue
Norfolk, VA 23511-3095

RE: Naval Weapons Industrial Research Plant(NWIRP)
Site-Bethpage, NYSDEC No. 1-30-003B.
Grumman Aerospace Site, NYSDEC Site No. 1-30-003A

Dear Ms. Fly:

Tetra Tech FW, on behalf of the Department of the Navy (Navy), has submitted the enclosed New York State Department of Environmental Conservation (NYSDEC) Division of Air Resources (DAR) Air Permit Application as a permit equivalent. This DAR Air permit equivalent is for the air stripper discharge at the GM 38 Area groundwater remediation system, Near Broadway and North Herman Avenue in Bethpage, NY. The NYSDEC Division of Environmental Remediation (DER) has reviewed the permit equivalent and, by means of this letter approves the GM 38 Area remedy air discharge for immediate operation.

The GM 38 Area remedial system utilizes the best available control technology (BACT) with activated carbon followed by potassium permanganate impregnated xeolite resin. The air discharge will be periodically monitored at start up and will be added for routine monitoring in the operation, maintenance and monitoring (OMM) plan, to be submitted shortly for Departmental review.

If you have any questions, please contact me at your earliest convenience at (518)402-9620.

Sincerely,

Steven M. Scharf, P.E.
Project Engineer
Division of Environmental Remediation
Bureau of Remedial Action A

Enclosure
ec/w/enc:
J. Swartwout/S. Scharf/File
W. Parish, Region 1 NYSDEC
A. J. Shah, region 1 NYSDEC
S. Patselos, Tetra Tech FW
J. Cofman, Northrop Grumman]
edocs: Region 1, Nassau, Oyster Bay (T): Grumman Aerospace 130003A-OU2-OMM and NWIRP Bethpage 130003B-OU2-OMM

New York State Department of Environmental Conservation
Air Permit Application

DEC ID	APPLICATION ID	OFFICE USE ONLY
- -	- /	/ /

Section I - Certification

Title V Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information [required pursuant to 6 NYCRR 201-6.3(d)] I believe the information is, true, accurate and complete I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations

Responsible Official	Title
Signature	Date / /

State Facility Certification

I certify that this facility will be operated in conformance with all provisions of existing regulations.

Responsible Official	Title
Signature	Date / /

Section II - Identification Information

Title V Facility Permit N/A	State Facility Permit N/A
❑ New ❑ Significant Modification ❑ Administrative Amendment	❑ New ❑ Modification
❑ Renewal ❑ Minor Modification General Permit Title:	General Permit Title:
☒ Application involves construction of new facility ❑ Application involves construction of new emission unit(s)	

Owner/Firm

Name	US Navy/NAVFAC Midlant			
Street Address	9742 Maryland Ave, Bldg Z-144			
City	Norfolk	State VA	Country US	Zip 23511-3095
Owner Classification	☒ Federal ❑ State ❑ Municipal ❑ Corporation/Partnership ❑ Individual			Taxpayer ID

Facility

❑ Confidential

Name	Naval Weapons Industrial Reserve Plant (NWIRP) GM-38 Area	
Location Address	Bethpage	
❑ City / ☒ Town / ❑ Village	Oyster Bay, New York	Zip 11714

Project Description

❑ Continuation Sheet(s)

Air stripping of groundwater to remove VOCs

Owner/Firm Contact Mailing Address

Name (Last, First, Middle Initial)	Fly, Lora		Phone No. (757) 444-0781
Affiliation	Department of the Navy	Title Remedial PM	Fax No. ( )
Street Address	9742 Maryland Ave. Bldg Z-144		
City	Norfolk	State VA	Country US	Zip 23511-3095

Facility Contact Mailing Address

Name (Last, First, Middle Initial)	Same		Phone No. ( )
Affiliation		Title	Fax No. ( )
Street Address			
City		State	Country	Zip

New York State Department of Environmental Conservation
Air Permit Application

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Section III - Facility Information

Classification

❑ Hospital ❑ Residential ❑ Educational/Institutional ❑ Commercial ☒ Industrial ❑ Utility

Affected States (Title V Only) N/A

❑ Vermont ❑ Massachusetts ❑ Rhode Island ❑ Pennsylvania Tribal Land:_____
❑ New Hampshire ❑ Connecticut ❑ New Jersey ❑ Ohio Tribal Land:_____

SIC Codes

9999												

Facility Description ❑ Continuation Sheet(s)

Groundwater Remediation by Air Stripping followed by Vapor-Phase GAC for emission control

Compliance Statements (Title V Only) N/A

I certify that as of the date of this application the facility is in compliance with all applicable requirements: ❑ YES ❑ NO

If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at this facility that are operating in compliance with all applicable requirements complete the following:

- ❑ This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those units referenced in the compliance plan portion of Section IV of this application.
- ❑ For all emission units, subject to any applicable requirements that will become effective during the term of the permit, this facility will meet all such requirements on a timely basis.
- ❑ Compliance certification reports will be submitted at least once a year. Each report will certify compliance status with respect to each requirement, and the method used to determine the status.

Facility Applicable Federal Requirements N/A ❑ Continuation Sheet(s)

Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause
	CERCLA	all substantive requirements							

Facility State Only Requirements ❑ Continuation Sheet(s)

Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause

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Section III - Facility Information (continued)

Facility Compliance Certification N/A ❑ Continuation Sheet(s)

Rule Citation

Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause

❑ Applicable Federal Requirement ❑ State Only Requirement	❑ Capping	CAS No.	Contaminant Name
		- -	

Monitoring Information

❑ Ambient Air Monitoring ❑ Work Practice Involving Specific Operations ❑ Record Keeping/Maintenance Procedures

Description

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description

Facility Emissions Summary ❑ Continuation Sheet(s)

CAS No.	Contaminant Name	PTE (lbs/yr)	PTE Range Code	Actual (lbs/yr)
NY075 - 00 - 5	PM-10			
NY075 - 00 - 0	PARTICULATES			
7446 - 09 - 5	SULFUR DIOXIDE			
NY210 - 00 - 0	OXIDES OF NITROGEN			
630 - 08 - 0	CARBON MONOXIDE			
7439 - 92 - 1	LEAD			
NY998 - 00 - 0	VOC	117		
NY100 - 00 - 0	HAP	110		
0079 - 01 - 6	Trichloroethylene	99		
00075 - 01 - 4	Vinyl Chloride	3.7		
00540 - 59 - 0	1,2-Dichloroethylene	7.3		
- -				
- -				

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Section IV - Emission Unit Information

Emission Unit Description

❑ Continuation Sheet(s)

EMISSION UNIT: 0-00EU1

Air Stripper AS-1 for groundwater remediation, provided with activated carbon for emission control. The emission point is stack 00ST-1. The 2-stage VGAC is followed by a 3rd vessel containing a potassium permanganate zeolite media for increased VC capacity.

Building

❑ Continuation Sheet(s)

Building	Building Name	Length (ft)	Width (ft)	Orientation
BLDG-1	Treatment Plant	75	75	0

Emission Point

❑ Continuation Sheet(s)

EMISSION PT.: 00ST1

Ground Elev. (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section	
					Length (in)	Width (in)
90	40	15	36	80		
Exit Velocity (FPS)	**Exit Flow (ACFM)**	**NYTM (E) (KM)**	**NYTM (N) (KM)**	**Building**	**Distance to Property Line (ft)**	**Date of Removal**
19	8020			BLDG-1	50	

EMISSION PT.:

Ground Elev. (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section	
					Length (in)	Width (in)
Exit Velocity (FPS)	**Exit Flow (ACFM)**	**NYTM (E) (KM)**	**NYTM (N) (KM)**	**Building**	**Distance to Property Line (ft)**	**Date of Removal**

Emission Source/Control

❑ Continuation Sheet(s)

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.
AS-1	I				048	Granular Act. Carbon	Air Stripping Column

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

Emission Source ID	Emission Source Type	Date of Construction	Date of Operation	Date of Removal	Control Type Code	Control Type Description	Manufacturer's Name/Model No.

Design Capacity	Design Capacity Units Code	Design Capacity Units Description	Waste Feed Code	Waste Feed Description	Waste Type Code	Waste Type Description

New York State Department of Environmental Conservation
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Section IV - Emission Unit Information (continued)

Process Information ❑ Continuation Sheet(s)

EMISSION UNIT 0-00EU1 PROCESS PR1

Description

The remedial system is air stripping, using a packed column at a groundwater flow rate of 1,100 gpm (plus 100 gpm recycle, for a total of 1,200 gpm). Vapor phase treatment includes the use of 3 vessels, a 2-stage GAC unit, followed by a 3rd vessel containing a potassium permanganate impregnated zeolite for increased VC capacity. Prior to entering the vapor-phase GAC adsorption system, the humidity of the air stripper exhaust is reduced to approximately 50 percent or less to optimize the efficiency of the vapor-phase GAC.

Air Stripper AS-1: Existing. Type: Vertical, Cylindrical Construction: Aluminum

Packing: 25-foot Jaeger Tripack. Dimensions: 10.0 ft. Dia x 47 ft. H

Source Classification Code (SCC)	Total Thruput		Thruput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

❑ Confidential ☒ Operating at Maximum Capacity ❑ Activity with Insignificant Emissions	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		
	24	365	BLDG-1	Main

Emission Source/Control Identifier(s)

AS-1							

EMISSION UNIT - PROCESS

Description

Source Classification Code (SCC)	Total Thruput		Thruput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description

❑ Confidential ❑ Operating at Maximum Capacity ❑ Activity with Insignificant Emissions	Operating Schedule		Building	Floor/Location
	Hrs/Day	Days/Yr		

Emission Source/Control Identifier(s)

New York State Department of Environmental Conservation
Air Permit Application

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Section IV - Emission Unit Information (continued)

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements ❑ Continuation Sheet(s)									
				Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause
-													
-													
-													
-													

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements ❑ Continuation Sheet(s)									
				Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause
-													
-													
-													
-													

Emission Unit Compliance Certification ❑ Continuation Sheet(s)

Rule Citation

Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause
6	NYCRR	212							

☒ Applicable Federal Requirement ❑ State Only Requirement ❑ Capping

Emission Unit	Emission Point	Process	Emission Source	CAS No.	Contaminant Name
0-00EU1	00ST1	PR1	AS-1	00079 - 01 - 6	Trichloroethylene

Monitoring Information

❑ Continuous Emission Monitoring
☒ Intermittent Emission Testing
❑ Ambient Air Monitoring
❑ Monitoring of Process or Control Device Parameters as Surrogate
❑ Work Practice Involving Specific Operations
❑ Record Keeping/Maintenance Procedures

Description

Monthly grab samples analyzed for VOCs from the vapor phase treatment system influent, effluent and two intermediate locations.

Work Practice Type	Process Material Code	Process Material Description	Reference Test Method

Parameter Code	Parameter Description	Manufacturer Name/Model No.
23	Concentration	

Limit Upper	Limit Lower	Limit Units Code	Limit Units Description
3,125		255	micrograms per cubic meter

Averaging Method Code	Averaging Method Description	Monitoring Frequency Code	Monitoring Frequency Description	Reporting Requirements Code	Reporting Requirements Description
01	Instantaneous	05	Monthly	10	Upon Request

DEC ID
- -

Section IV - Emission Unit Information (continued)

Determination of Non-Applicability (Title V Only) N/A ❑ Continuation Sheet(s)

Rule Citation

Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause

Emission Unit	Emission Point	Process	Emission Source	❑ Applicable Federal Requirement ❑ State Only Requirement
-				

Description

Rule Citation

Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause

Emission Unit	Emission Point	Process	Emission Source	❑ Applicable Federal Requirement ❑ State Only Requirement
-				

Description

Process Emissions Summary ❑ Continuation Sheet(s)

EMISSION UNIT	0-00EU1				PROCESS	P R 1
CAS No.	Contaminant Name	% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined
0079 - 01 - 6	Trichloroethylene			95	1.87	02

PTE (lbs/hr)	PTE (lbs/yr)	PTE (standard units)	Standard Units	PTE How Determined	Actual (lbs/hr)	Actual (lbs/yr)
0.09	99			02		

EMISSION UNIT	0-00EU1				PROCESS	P R 1
CAS No.	Contaminant Name	% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined
00075- 01 - 4	Vinyl Chloride			95	0.17	03

PTE (lbs/hr)	PTE (lbs/yr)	PTE (standard units)	Standard Units	PTE How Determined	Actual (lbs/hr)	Actual (lbs/yr)
0.01	3.7			02		

EMISSION UNIT	0-00EU1				PROCESS	P R 1
CAS No.	Contaminant Name	% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined
000540 - 59 - 0	1,2-Dichloroethylene			95	0.6	02

PTE (lbs/hr)	PTE (lbs/yr)	PTE (standard units)	Standard Units	PTE How Determined	Actual (lbs/hr)	Actual (lbs/yr)
0.03	7.3			02		

DEC ID
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Section IV - Emission Unit Information (continued)

EMISSION UNIT 0-00EU1	Emission Unit Emissions Summary			❑ Continuation Sheet(s)
CAS No.	Contaminant Name			
00107-06-2	1,2-Dichloroethane			
ERP (lbs/yr)	PTE Emissions		Actual	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
13.4	Below Reporting Threshold BRT			
CAS No.	Contaminant Name			
00108-88-3	Toluene			
ERP (lbs/yr)	PTE Emissions		Actual	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
72.7	BRT	BRT		
CAS No.	Contaminant Name			
01330-20-7	Xylene			
ERP (lbs/yr)	PTE Emissions		Actual	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
77.1	BRT	BRT		
CAS No.	Contaminant Name			
- -	1,1,2-Trichloroethane			
ERP (lbs/yr)	PTE Emissions		Actual	
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
	BRT	BRT		

Compliance Plan

❑ Continuation Sheet(s)

For any emission units which are not in compliance at the time of permit application, the applicant shall complete the following

Consent Order — Certified progress reports are to be submitted every 6 months beginning ____/____/____

Emission Unit	Process	Emission Source	Applicable Federal Requirement									
			Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause
-												

Remedial Measure / Intermediate Milestones	R/I	Date Scheduled

DEC ID

Section IV - Emission Unit Information (continued)

Request for Emission Reduction Credits

❑ Continuation Sheet(s)

EMISSION UNIT

Emission Reduction Description

Contaminant Emission Reduction Data

Baseline Period ____/____/____ to ____/____/____

Reduction Date	Reduction Method
/ /	

CAS No.	Contaminant Name	ERC (lbs/yr) Netting	ERC (lbs/yr) Offset
- -			
- -			
- -			

Facility to Use Future Reduction

Name

APPLICATION ID

Location Address

❑ City / ❑ Town / ❑ Village | State | Zip

Use of Emission Reduction Credits

❑ Continuation Sheet(s)

EMISSION UNIT

Proposed Project Description

Contaminant Emissions Increase Data

CAS No.	Contaminant Name	PEP (lbs/yr)
- -		

Statement of Compliance

❑ All facilities under the ownership of this "ownership/firm" are operating in compliance with all applicable requirements and state regulations including any compliance certification requirements under Section 114(a)(3) of the Clean Air Act Amendments of 1990, or are meeting the schedule of a consent order.

Source of Emission Reduction Credit - Facility

Name

PERMIT ID

Location Address

❑ City / ❑ Town / ❑ Village | State | Zip

Emission Unit	CAS No.	Contaminant Name	ERC (lbs/yr) Netting	ERC (lbs/yr) Offset
-	- -			
-	- -			
-	- -			

DEC ID
- -

Supporting Documentation

- ☒ P.E. Certification (form attached)
- ☐ List of Exempt Activities (form attached)
- ☒ Plot Plan
- ☐ Methods Used to Determine Compliance (form attached)
- ☒ Calculations
- ☐ Air Quality Model (_____ / _____ / _____)
- ☐ Confidentiality Justification
- ☐ Ambient Air Monitoring Plan (_____ / _____ / _____)
- ☐ Stack Test Protocols/Reports (_____ / _____ / _____)
- ☐ Continuous Emissions Monitoring Plans/QA/QC (_____ / _____ / _____)
- ☐ MACT Demonstration (_____ / _____ / _____)
- ☐ Operational Flexibility: Description of Alternative Operating Scenarios and Protocols
- ☐ Title IV: Application/Registration
- ☐ ERC Quantification (form attached)
- ☐ Use of ERC(s) (form attached)
- ☐ Baseline Period Demonstration
- ☐ Analysis of Contemporaneous Emission Increase/Decrease
- ☐ LAER Demonstration (_____ / _____ / _____)
- ☐ BACT Demonstration (_____ / _____ / _____)
- ☐ Other Document(s): _____ (/ /)

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ATTACHMENT 1
Emission Estimate

Feed Water Flow	1,100	gpm: max or normal
	250	m^3/hr
Water Flow Including Recycle	1,200	gpm: max or normal
	273	m^3/hr
Air Flow	8,000	cfm
	13,592	m^3/hr
A/W vol ratio	50	

EXAMPLE EMISSION CALC: Vinyl Chloride
4.8 ug/L x 1000 L/m^3 x 250 m^3 water/13,623 m^3 air = 88 ug/m^3

					GW Conc.[1]		Effluent Conc[1]		Uncontrolled Stripper Exhaust							
	CAS	Toxicity:			Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg
Name	Number	H/M/L[2]	VOC[3]	HAP[4]	ug/L	ug/L	ug/L	ug/L	lb/day	lb/day	lb/hr	lb/hr	gm/sec	gm/sec	ug/m^3	ug/m^3
1,1,1-Trichloroethane (Methyl Chloroform)	00071-55-6	L	**No**	Yes	3	3.0			0.04	0.04	0.00	0.00	2.08E-04	2.08E-04	55	55
1,1,2-Trichloroethane	00079-00-5	M	Yes	Yes	3.5	0.3			0.05	0.00	0.00	0.00	2.43E-04	2.08E-05	64	6
1,1-Dichloroethane	00075-34-3	L	Yes	Yes	4	0.7			0.05	0.01	0.00	0.00	2.77E-04	4.85E-05	74	13
1,2-Dichloroethane	00107-06-2	M	Yes	Yes	3	1.0	0.3	0.1	0.04	0.01	0.00	0.00	1.87E-04	6.24E-05	55	18
1,1-Dichloroethylene (Vinylidene Chloride)	00075-35-4	M	Yes	Yes	9	1.6			0.12	0.02	0.00	0.00	6.24E-04	1.11E-04	165	29
1,2-Dichloroethylene	00540-59-0	M	Yes	**No**	1,100	31.5	1.3	0.0	14.51	0.42	0.60	0.02	7.62E-02	2.18E-03	20,219	579
Benzene	00071-43-2	H	Yes	Yes	4	0.1			0.05	0.00	0.00	0.00	2.77E-04	6.94E-06	74	2
Carbon Tetrachloride	00056-23-5	H	Yes	Yes	4	0.1			0.05	0.00	0.00	0.00	2.77E-04	6.94E-06	74	2
Chlorobenzene (Monochlorobenzene)	00108-90-7	M	Yes	Yes	1	0.1			0.01	0.00	0.00	0.00	6.94E-05	6.94E-06	18	2
Chloroform	00067-66-3	M	Yes	Yes	2	0.8			0.03	0.01	0.00	0.00	1.39E-04	5.55E-05	37	15
Methyl Tert Butyl Ether	01634-04-4	M	Yes	Yes	2	0.1			0.03	0.00	0.00	0.00	1.39E-04	6.94E-06	37	2
Tetrachloroethylene	00127-18-4	M	Yes	Yes	900	33.8	0.9	0.0	11.88	0.45	0.49	0.02	6.24E-02	2.34E-03	16,543	621
Toluene	00108-88-3	L	Yes	Yes	15	0.7			0.20	0.01	0.01	0.00	1.04E-03	4.85E-05	276	13
Trichloroethylene	00079-01-6	M	Yes	Yes	3,400	411.5	4.5	0.5	44.86	5.43	1.87	0.23	2.35E-01	2.85E-02	62,494	7,564
Vinyl chloride	00075-01-4	H	Yes	Yes	300	4.8	0.0	0.0	3.96	0.06	0.17	0.00	2.08E-02	3.33E-04	5,514	88
Xylenes	01330-20-7	M	Yes	Yes	16	0.2			0.21	0.00	0.01	0.00	1.11E-03	1.39E-05	294	4
Total VOCs					5,764	487.3	7.0	0.6	76.05	6.43	3.17	0.27				
Total HAPs					4,667	458.8	5.7	0.6	61.57	6.05	2.57	0.25				

Total Uncontrolled VOC 2,347 lb/yr
Total Uncontrolled HAP 2,209 lb/yr

1. Source: "GM-38 Groundwater Remedy Analysis Report", February 2003
2. Source: DAR-1 AGC/SGC Tables, NYSDEC Division of Air Resources, Air Toxics Section, September 10, 2007.
3. Source: 6 NYCRR Part 200.1(cg)
4. Source: 6 NYCRR Part 200.1(ag)

ATTACHMENT 1
Emission Estimate

Feed Water Flow	1,100	gpm: max or normal
	250	m^3/hr
Water Flow Including Recycle	1,200	gpm: max or normal
	273	m^3/hr
Air Flow	8,000	cfm
	13,592	m^3/hr
A/W vol ratio	50	

								Controlled Stripper Exhaust	
Name	CAS Number	Toxicity: H/M/L[2]	VOC[3]	HAP[4]	Control by GAC	Max lb/day	Avg lb/day	Max gm/sec	Avg gm/sec
1,1,1-Trichloroethane (Methyl Chloroform)	00071-55-6	L	**No**	Yes	95%	0.00	0.00	1.04E-05	1.04E-05
1,1,2-Trichloroethane	00079-00-5	M	Yes	Yes	95%	0.00	0.00	1.21E-05	1.04E-06
1,1-Dichloroethane	00075-34-3	L	Yes	Yes	95%	0.00	0.00	1.39E-05	2.43E-06
1,2-Dichloroethane	00107-06-2	M	Yes	Yes	95%	0.00	0.00	9.36E-06	3.12E-06
1,1-Dichloroethylene (Vinylidene Chloride)	00075-35-4	M	Yes	Yes	95%	0.01	0.00	3.12E-05	5.55E-06
1,2-Dichloroethylene	00540-59-0	M	Yes	**No**	95%	0.73	0.02	3.81E-03	1.09E-04
Benzene	00071-43-2	H	Yes	Yes	95%	0.00	0.00	1.39E-05	3.47E-07
Carbon Tetrachloride	00056-23-5	H	Yes	Yes	95%	0.00	0.00	1.39E-05	3.47E-07
Chlorobenzene (Monochlorobenzene)	00108-90-7	M	Yes	Yes	95%	0.00	0.00	3.47E-06	3.47E-07
Chloroform	00067-66-3	M	Yes	Yes	95%	0.00	0.00	6.94E-06	2.77E-06
Methyl Tert Butyl Ether	01634-04-4	M	Yes	Yes	95%	0.00	0.00	6.94E-06	3.47E-07
Tetrachloroethylene	00127-18-4	M	Yes	Yes	95%	0.59	0.02	3.12E-03	1.17E-04
Toluene	00108-88-3	L	Yes	Yes	95%	0.01	0.00	5.20E-05	2.43E-06
Trichloroethylene	00079-01-6	M	Yes	Yes	95%	2.24	0.27	1.18E-02	1.43E-03
Vinyl chloride	00075-01-4	H	Yes	Yes	95%	0.20	0.00	1.04E-03	1.66E-05
Xylenes	01330-20-7	M	Yes	Yes	95%	0.01	0.00	5.55E-05	6.94E-07
Total VOCs						3.80	0.32		
Total HAPs						3.08	0.30		

Total Controlled VOC	117	lb/yr
Total Controlled HAP	110	lb/yr

1. Source: "GM-38 Groundwater Remedy Analysis Report", February 2003
2. Source: DAR-1 AGC/SGC Tables, NYSDEC Division of Air Resources, Air Tox
3. Source: 6 NYCRR Part 200.1(cg)
4. Source: 6 NYCRR Part 200.1(ag)

ATTACHMENT 2
AIR SCREENING ANALYSIS:
Annual

BETHPAGE SCREENING ANALYSIS					1-Hour Impact	405.7	(ug/m^3)	
ANNUAL IMPACTS COMPARED TO ANNUAL GUIDELINE CONCENTRATIONS (AGCs)					Annual Impact	32.456	(ug/m^3)	
		NYSDEC Guideline	Estimated Emissions		Predicted Annual Impact		Maximum Percent of AGC	
		AGC	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled
Pollutant	CAS Number	(ug/m^3)	(g/s)	(g/s)	(ug/m^3)	(ug/m^3)	Pct	Pct
1,1,1-Trichloroethane (Methyl Chloroform)	00071-55-6	1000.00	2.08E-04	1.04E-05	0.0068	0.0003	0.0%	0.0%
1,1,2-Trichloroethane	00079-00-5	1.40	2.08E-05	1.04E-06	0.0007	0.0000	0.0%	0.0%
1,1-Dichloroethane	00075-34-3	0.63	4.85E-05	2.43E-06	0.0016	0.0001	0.3%	0.0%
1,2-Dichloroethane	00107-06-2	0.04	6.24E-05	3.12E-06	0.0020	0.0001	5.3%	0.3%
1,1-Dichloroethylene (Vinylidene Chloride)	00075-35-4	70.00	1.11E-04	5.55E-06	0.0036	0.0002	0.0%	0.0%
1,2-Dichloroethylene	00540-59-0	63.00	2.18E-03	1.09E-04	0.0709	0.0035	0.1%	0.0%
Benzene	00071-43-2	0.13	6.94E-06	3.47E-07	0.0002	0.0000	0.2%	0.0%
Carbon Tetrachloride	00056-23-5	0.07	6.94E-06	3.47E-07	0.0002	0.0000	0.3%	0.0%
Chlorobenzene (Monochlorobenzene)	00108-90-7	110.00	6.94E-06	3.47E-07	0.0002	0.0000	0.0%	0.0%
Chloroform	00067-66-3	0.04	5.55E-05	2.77E-06	0.0018	0.0001	4.2%	0.2%
Methyl tert-Butyl Ether	01634-04-4	3000.00	6.94E-06	3.47E-07	0.0002	0.0000	0.0%	0.0%
Tetrachloroethylene	00127-18-4	1.00	2.34E-03	1.17E-04	0.0761	0.0038	7.6%	0.4%
Toluene	00108-88-3	5000.00	4.85E-05	2.43E-06	0.0016	0.0001	0.0%	0.0%
Trichloroethylene	00079-01-6	0.50	2.85E-02	1.43E-03	0.9252	0.0463	**185.0%**	9.3%
Vinyl Chloride	00075-01-4	0.11	3.33E-04	1.66E-05	0.0108	0.0005	9.8%	0.5%
Xylenes	01330-20-7	100.00	1.39E-05	6.94E-07	0.0005	0.0000	0.0%	0.0%

ATTACHMENT 2
AIR SCREENING ANALYSIS:
Short term

BETHPAGE SCREENING ANALYSIS					1-Hour Impact	405.7	(ug/m^3)
SHORT-TERM IMPACTS COMPARED TO SHORT-TERM GUIDELINE CONCENTRATIONS (SGCs)					Annual Impact	32.456	(ug/m^3)

		NYSDEC Guideline	Estimated Emissions		Predicted Short-term Impact		Maximum Percent of SGC	
		SGC	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled
Pollutant	CAS Number	(ug/m^3)	(g/s)	(g/s)	(ug/m^3)	(ug/m^3)	Pct	Pct
1,1,1-Trichloroethane (Methyl Chloroform)	00071-55-6	68000.00	2.08E-04	1.04E-05	0.084	0.004	0.0%	0.0%
1,1,2-Trichloroethane	00079-00-5	-	2.43E-04	1.21E-05	0.098	0.005	-	-
1,1-Dichloroethane	00075-34-3	-	2.77E-04	1.39E-05	0.113	0.006	-	-
1,2-Dichloroethane	00107-06-2	-	1.87E-04	9.36E-06	0.076	0.004	-	-
1,1-Dichloroethylene (Vinylidene Chloride)	00075-35-4	-	6.24E-04	3.12E-05	0.253	0.013	-	-
1,2-Dichloroethylene	00540-59-0	-	7.62E-02	3.81E-03	30.915	1.546	-	-
Benzene	00071-43-2	1300.00	2.77E-04	1.39E-05	0.113	0.006	0.0%	0.0%
Carbon Tetrachloride	00056-23-5	1900.00	2.77E-04	1.39E-05	0.113	0.006	0.0%	0.0%
Chlorobenzene (Monochlorobenzene)	00108-90-7	-	6.94E-05	3.47E-06	0.028	0.001	-	-
Chloroform	00067-66-3	150.00	1.39E-04	6.94E-06	0.056	0.003	0.0%	0.0%
Methyl tert-Butyl Ether	01634-04-4	-	1.39E-04	6.94E-06	0.056	0.003	-	-
Tetrachloroethylene	00127-18-4	1000.00	6.24E-02	3.12E-03	25.298	1.265	2.5%	0.1%
Toluene	00108-88-3	37000.00	1.04E-03	5.20E-05	0.422	0.021	0.0%	0.0%
Trichloroethylene	00079-01-6	14000.00	2.35E-01	1.18E-02	95.541	4.777	0.7%	0.0%
Vinyl Chloride	00075-01-4	180000.00	2.08E-02	1.04E-03	8.441	0.422	0.0%	0.0%
Xylenes	01330-20-7	4300.00	1.11E-03	5.55E-05	0.450	0.023	0.0%	0.0%

ATTACHMENT 2
AIR SCREENING ANALYSIS:
Short term

BETHPAGE SCREENING ANALYSIS					1-Hour Impact	405.7	(ug/m^3)	
SHORT-TERM IMPACTS COMPARED TO SHORT-TERM GUIDELINE CONCENTRATIONS (SGCs)					Annual Impact	32.456	(ug/m^3)	
		NYSDEC Guideline	Estimated Emissions		Predicted Short-term Impact		Maximum Percent of SGC	
		SGC	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled
Pollutant	CAS Number	(ug/m^3)	(g/s)	(g/s)	(ug/m^3)	(ug/m^3)	Pct	Pct
1,1,1-Trichloroethane (Methyl Chloroform)	00071-55-6	68000.00	2.08E-04	1.04E-05	0.084	0.004	0.0%	0.0%
1,1,2-Trichloroethane	00079-00-5	-	2.43E-04	1.21E-05	0.098	0.005	-	-
1,1-Dichloroethane	00075-34-3	-	2.77E-04	1.39E-05	0.113	0.006	-	-
1,2-Dichloroethane	00107-06-2	-	1.87E-04	9.36E-06	0.076	0.004	-	-
1,1-Dichloroethylene (Vinylidene Chloride)	00075-35-4	-	6.24E-04	3.12E-05	0.253	0.013	-	-
1,2-Dichloroethylene	00540-59-0	-	7.62E-02	3.81E-03	30.915	1.546	-	-
Benzene	00071-43-2	1300.00	2.77E-04	1.39E-05	0.113	0.006	0.0%	0.0%
Carbon Tetrachloride	00056-23-5	1900.00	2.77E-04	1.39E-05	0.113	0.006	0.0%	0.0%
Chlorobenzene (Monochlorobenzene)	00108-90-7	-	6.94E-05	3.47E-06	0.028	0.001	-	-
Chloroform	00067-66-3	150.00	1.39E-04	6.94E-06	0.056	0.003	0.0%	0.0%
Methyl tert-Butyl Ether	01634-04-4	-	1.39E-04	6.94E-06	0.056	0.003	-	-
Tetrachloroethylene	00127-18-4	1000.00	6.24E-02	3.12E-03	25.298	1.265	2.5%	0.1%
Toluene	00108-88-3	37000.00	1.04E-03	5.20E-05	0.422	0.021	0.0%	0.0%
Trichloroethylene	00079-01-6	14000.00	2.35E-01	1.18E-02	95.541	4.777	0.7%	0.0%
Vinyl Chloride	00075-01-4	180000.00	2.08E-02	1.04E-03	8.441	0.422	0.0%	0.0%
Xylenes	01330-20-7	4300.00	1.11E-03	5.55E-05	0.450	0.023	0.0%	0.0%

03/16/09
11:26:15

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Bethpage GM-38 Air Stripper Uncontrolled

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	12.2000
STK INSIDE DIAM (M)	=	.9100
STK EXIT VELOCITY (M/S)	=	5.7700
STK GAS EXIT TEMP (K)	=	294.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	7.6000
MIN HORIZ BLDG DIM (M)	=	22.9000
MAX HORIZ BLDG DIM (M)	=	22.9000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .040 M**4/S**3; MOM. FLUX = 6.869 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
10.	.1323E-07	1	1.5	1.5	480.0	22.39	3.65	2.99	NO
100.	278.3	3	1.0	1.0	320.0	27.34	22.00	20.46	NO
200.	339.9	6	1.0	1.1	10000.0	20.81	21.31	14.25	NO
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:									
201.	339.9	6	1.0	1.1	10000.0	20.81	21.51	14.37	NO

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 2. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
210.	405.7	6	1.0	1.1	10000.0	18.81	22.32	14.86	NO
300.	307.9	6	1.0	1.1	10000.0	18.81	31.28	20.08	NO
400.	219.2	6	1.0	1.1	10000.0	18.81	40.93	25.42	NO

500.	162.3	6	1.0	1.1	10000.0	18.81	50.27	30.34	NO
600.	125.2	6	1.0	1.1	10000.0	18.81	59.32	34.91	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 210. M:

210.	405.7	6	1.0	1.1	10000.0	18.81	22.32	14.86	NO

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 9. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
610.	133.2	6	1.0	1.1	10000.0	11.81	60.21	35.35	NO
700.	107.4	6	1.0	1.1	10000.0	11.81	68.10	39.19	NO
800.	87.22	6	1.0	1.1	10000.0	11.81	76.63	43.22	NO
900.	72.75	6	1.0	1.1	10000.0	11.81	84.93	47.03	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 610. M:

610.	133.2	6	1.0	1.1	10000.0	11.81	60.21	35.35	NO

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 11. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1000.	62.47	6	1.0	1.1	10000.0	9.81	93.00	50.66	NO
1100.	54.05	6	1.0	1.1	10000.0	9.81	100.86	54.11	NO
1200.	47.42	6	1.0	1.1	10000.0	9.81	108.53	57.42	NO
1300.	42.10	6	1.0	1.1	10000.0	9.81	116.01	60.60	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1000. M:

1000.	62.47	6	1.0	1.1	10000.0	9.81	93.00	50.66	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
* SUMMARY OF TERRAIN HEIGHTS ENTERED FOR *
* SIMPLE ELEVATED TERRAIN PROCEDURE *
****

TERRAIN HT (M)	DISTANCE RANGE (M) MINIMUM	MAXIMUM
0.	10.	200.
2.	210.	600.
9.	610.	920.

```
          11.         1000.       1300.

****************************************
     *** REGULATORY (Default) ***
    PERFORMING CAVITY CALCULATIONS
  WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
****************************************
```

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	.0000	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	99.99	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	99.99	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	99.99	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	7.84	CAVITY HT (M)	=	7.84
CAVITY LENGTH (M)	=	22.86	CAVITY LENGTH (M)	=	22.86
ALONGWIND DIM (M)	=	22.90			

APPENDIX C

FIELD DATA SHEETS AND CHAIN OF CUSTODY DOCUMENTATION

Date: 6/17/13

H&S

Groundwater Level Measurement Sheet

Project Site: NWIRP Bethpage – GM-38
Location: Bethpage, NY
Field Crew: RM, JG

Water Level Meter: Solinst
Weather: partly cloudy, hot, humid
Time of Low Tide: N/A
Time of High Tide: N/A

Well ID	Time	Depth to Water (ft.)	Total Depth of Well / Screed Interval (ft.)	PID (ppm)	Comments
RW1-MW1	1810	34.26	435 / 395-435		
RW1-MW2	0742	36.85	435 / 395-435		
RW1-MW3	2000	27.40	435 / 395-435		
RW2-MW1	0807	38.90	510 / 470-510		
RW2-MW2	0855	38.88	510 / 470-510		
RW2-MW3	0852	38.46	510 / 470-510		
RW3-MW1	0823	36.51	350 / 330-350		
RW3-MW2	0820	38.86	495 / 475-495		
RW3-MW3	0812	37.66	340 / 320-340		
RW3-MW4	0815	40.06	495 / 475-495		
TP1	0755	34.06	470 / 450-470		
IW1-MW1	0746	34.68	470 / 450-470		

Signature: [signature]

Date: 6/17/13

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 1 - MW 1

Date: 6/19/13
Sampler: JB, RM
PID: ------

Start Time: 1348 End Time: 1540
Well Construction: 4"
Depth to Water: 34.40
Well Depth: 435
Water Column: 400.6'
Total Volume Removed (L): ~24 L
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020e	ME 12295
QED	MP15	Rental
Marschalk Bladder Pump	24"	ID# 6884 / 711 - sample Tubing

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
1353	1.7	340	34.40	17.82	4.19	204	1.00	111.1	1.20	Clear
1358	~~1.7~~	340	34.36	17.99	4.22	205	0.80	115.8	2.82	Clear
1403	~~1.7~~	340	34.36	17.46	4.30	203	0.71	116.8	2.12	Clear
1408	~~1.7~~	340	34.30	17.49	4.28	204	0.72	120.6	2.33	Clear
1413	~~1.7~~	340	34.30	17.79	4.31	204	0.78	125.8	1.35	Clear
1418	~~1.7~~	340	34.30	17.94	4.33	205	0.84	130.4	1.04	Clear
~~1423~~	1.7	340								
~~1428~~	1.7	340								
1500	2.2	440	33.98	20.43	4.33	204	0.81	153.0	0.69	Clear
1505	2.2	440	33.95	20.12	4.43	204	0.67	148.6	0.09	"
1510	2.2	440	33.95	22.95	4.59	204	0.53	141.4	1.36	"
1515	1.5	300	33.94	22.42	4.61	206	0.56	133.5	1.42	clear
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

Restart pump @ 1455

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Flow dropping for recovery

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1540	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 1 -MW 1 -	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228
		+ all add'l parameters			

Comments

Pulled pump @ 1418 due to loss of flow, switch pumps & restart pump @ 1455

Signature

6/19/13
Date

Pg 1/2

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW | - MW | -

Date: 6/19/13
Sampler: RMastrocola / JHood
PID: ------

Start Time: 1348 End Time: 1540
Well Construction: 4"
Depth to Water: See Pg 1
Well Depth: See Pg 1
Water Column: See Pg 1
Total Volume Removed (L): _____
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	
LaMotte	2020e	
QED	MP15	
Marschalk Bladder Pump	24"	ID#

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
1520	1.5	300	33.74	20.89	4.50	203	0.55	141.5	1.96	Clear
1525	1.2	240	33.92	20.76	4.47	205	0.54	144.8	2.14	Clear
1530	1.25	250	33.92	21.42	4.52	203	0.51	144.0	2.31	Clear
1535	0.8	160	33.90	22.47	4.59	203	0.49	138.3	1.73	Clear
1540	0.85	170	33.90	22.47	4.58	205	0.50	136.2	2.07	Clear

Acceptance Criteria:	<0.3ft	3%	±0.1	3%	10%	± 10mv	10%

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1540	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW | -MW | -	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228

Comments

Begin sample collection @ 1540, finish @ 1700

BWD finishes @

Signature

6/19/13
Date

Pg 2/2

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 1 - MW 3

Date: 6/19/13
Sampler: JT, RM
PID: ------

Start Time: 0953 **End Time:** 10:58
Well Construction: 4"
Depth to Water: 27.50
Well Depth: 435'
Water Column: ~407.5'
Total Volume Removed (L): ~22L
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H10d928
LaMotte	2020	19984
QED	MP15	FOR
Marschalk Bladder Pump	24"	ID# 6884

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0958	1.7	340	27.54	15.15	4.80	192	1.02	128.2	2.04	clear
1003		340	27.57	15.03	4.81	193	0.69	129.8	2.78	"
1008		340	27.59	14.93	4.83	197	0.48	133.0	2.88	"
1013		340	27.59	14.95	4.91	198	0.43	130.4	2.42	"
1018		340	27.60	14.88	4.98	198	0.38	129.3	3.58	"
1023		340	27.60	14.86	5.02	198	0.37	125.5	1.71	"
1028		340	27.60	14.89	5.06	197	0.29	120.1	1.56	"
1033		340	27.60	14.96	5.09	197	0.29	118.4	1.62	"
1038		340	27.60	14.90	5.09	198	0.27	118.6	1.70	"
1043		340	27.60	14.88	5.10	199	0.26	115.8	2.09	"
1048		340	27.60	14.93	5.11	198	0.25	113.1	3.64	"
1053	↓	340	27.60	14.88	5.11	197	0.25	111.2	4.05	"
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
10:58	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 1 -MW 3-061913	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228
		+ all add'l parameters -			

Comments

1¼+3/8"
Begin sampling @ 1058

Signature

6/19/13
Date

1058 1.7 340 27.60 14.86 5.11 197 0.25 113.0 3.68 "

29 +3 +1 +1 /34

P1/1

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 2 - MW 1

Date: 6/17/13
Sampler: JT, RM
PID: ------

Start Time: 0902 End Time: 1017
Well Construction: 4"
Depth to Water: 39.41
Well Depth: 510'
Water Column: 470.6
Total Volume Removed (L): ~17.0
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020e	ME 12295
QED	MP15	015784
Marschalk Bladder Pump	24"	ID# 711

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0907	1.2	240	39.51	16.09	8.38	116	1.94	160.8	16.6	Clear
0912			39.54	15.94	8.84	116	0.69	120.4	13.2	"
0917			39.54	15.49	9.02	117	0.40	75.1	12.7	"
0922			39.54	15.63	9.29	118	0.28	51.0	10.3	"
0927			39.54	15.63	9.02	121	0.22	-3.0	26.5	Light brown clear
0932			39.54	15.50	7.83	145	0.19	-144.3	24.2	"
0937			39.52	15.27	6.59	200	0.16	-53.3	23.3	"
0942			39.52	15.36	6.29	223	0.16	-41.4	22.5	"
0947			39.50	15.57	6.24	230	0.17	-43.3	16.6	clear
0952			39.49	15.60	6.21	232	0.18	-35.7	15.8	"
0957			39.48	15.72	6.23	231	0.18	-35.5	15.2	"
1002			39.48	15.68	6.23	230	0.18	-36.8	13.9	"
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1017	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 2-MW 1 - 061713	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228

Comments

3/8 x 1/2" drop tube extension

Field Blank FB-1 collected for VOCs, Hg, Gross Alpha/Beta & Radium 226/228

Signature

6/17/13
Date

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 2-MW 1

Date: 6/17/13
Sampler: JR, RM
PID: ------

Start Time: 0952 End Time: 1017
Well Construction: 4"
Depth to Water: 39.41
Well Depth: 470.61'
Water Column: 512'
Total Volume Removed (L): 217.0
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10171029 28
LaMotte	2020e	ME12295
QED	MP15	015784
Marschalk Bladder Pump	24"	ID# 711

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
1007	1.2	240	39.46	15.78	6.23	229	0.17	-37.6	11.9	Clear
1012	↓	↓	39.46	15.64	6.22	228	0.17	-36.9	12.0	"
1017	↓	↓	39.46	15.59	6.20	227	0.17	-34.6	11.8	"
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1017	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 2-MW 1 - 061713	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228

Comments

Filled bottles by 1025 - BWD went back & set bottles, kept purging until they came back @ 1039, sample time 1040, finish sampling @ 1140

Signature

6/17/13
Date

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 3 - MW 1

Date: 6/20/13
Sampler: JB, RM
PID: ------

Start Time: 0716 **End Time:** 0836
Well Construction: 4"
Depth to Water: 36.45
Well Depth: 350'
Water Column: ~312.6'
Total Volume Removed (L): ~20.8
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020we	19964
QED	MP15	Rental
Marschalk Bladder Pump	24"	ID# 711

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0726	2.6	260	36.49	14.49	4.67	148	1.96	218.6	10.73	clear
0731	1.3	260	36.50	14.37	4.11	143	1.03	245.7	14.60	clear
0736		260	36.50	14.38	4.21	142	0.96	242.4	12.60	clear
0741		260	36.50	14.40	4.30	143	0.93	237.9	12.50	clear
0746		260	36.50	14.45	4.42	143	0.85	231.9	11.60	clear
0751		260	36.52	14.48	4.44	142	0.84	230.4	11.40	clear
0756		260	36.52	14.46	4.56	143	0.82	226.0	10.85	clear
0801		260	36.52	14.50	4.53	143	0.80	223.8	9.31	clear
0806		260	36.52	14.51	4.55	143	0.80	221.1	8.05	clear
0811		260	36.52	14.51	4.57	143	0.79	217.5	6.27	clear
0816		260	36.52	14.54	4.59	143	0.75	215.0	5.30	clear
0821		260	36.53	14.62	4.62	143	0.74	212.7	5.29	clear
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
0836	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 3-MW 1 - 062013	250 mL PL	1	HNO_3	~~Hg (245.1)~~ MS/MSD
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228
		+ All adt'l parameters			

DUP-01-063013 + MS/MSD collected for ALL Parameters

Comments

Begin sampling DUP-01 + routine sample @ 0836, complete these 2 sets @ 1135 - BWD jumps in to collect their samples, finish @ 1245
Begin sampling MS/MSD sets @ 1245, complete all sampling @ 1530

Signature

6/21/13
Date

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW3 - MW1

Date: 6/20/13
Sampler: JG/RM
PID: ------

Start Time: 0716 End Time: 0836
Well Construction: 4"
Depth to Water: 36.45'
Well Depth: 350'
Water Column: ~ 312.6'
Total Volume Removed (L): ~ 72.8
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020e	19964
QED	MP15	Rental
Marschalk Bladder Pump	24"	ID# 711

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0826	↓	260	36.54	14.60	4.61	143	0.74	211.8	3.01	clear
0831		260	36.54	14.61	4.62	143	0.74	208.9	3.74	clear
0836		260	36.53	14.63	4.63	143	0.74	206.5	3.90	clear

Acceptance Criteria:	<0.3ft	3%	±0.1	3%	10%	± 10mv	10%

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
0836	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW3 -MW 1 - 062013	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228

Comments

See notes pg 1

Signature

6/20/13
Date

P 2/2

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW3 - MW 2

Date: 6/20/13
Sampler: JT
PID: ------

Start Time: 0855 End Time: 1010
Well Construction: 4"
Depth to Water: 39.18
Well Depth: 495
Water Column: ~455.81
Total Volume Removed (L): ~18.8
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10A100928
LaMotte	2020we	19964
QED	MP15	ECOR
Marschalk Bladder Pump	24"	ID# 6844

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0900	1.25	250	39.20	16.65	4.15	91	0.37	229.4	1.71	Clear
0905			39.20	16.63	4.22	91	0.35	225.6	1.63	"
0910			39.20	16.61	4.29	91	0.34	222.2	1.55	"
0915			39.20	16.59	4.41	91	0.30	211.2	2.15	"
0920			39.20	16.63	4.44	91	0.27	208.6	2.03	"
0925			39.18	16.53	4.51	91	0.26	202.8	1.97	"
0930			39.17	16.77	4.47	91	0.21	205.1	1.68	"
0935			39.17	16.65	4.49	91	0.19	202.1	1.34	"
0940			39.17	16.60	4.51	91	0.17	202.0	1.59	"
0945			39.17	16.45	4.50	91	0.18	205.7	2.80	"
0950			39.17	16.44	4.54	91	0.17	205.7	4.10	"
0955			39.17	16.54	4.55	91	0.17	205.7	2.83	"
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1010	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 3 -MW2- 062013	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228
		* All addt'l parameters			

Comments

begin sampling @ 100, complete QAQC sampling @ 1135.
Blind begins sampling @ 1135, completed @ 1205

Signature

6/20/13
Date

1000	1.25	250	39.17	16.51	4.55	91	0.17	206.2	3.14	
1005	↓	↓	39.17	16.50	4.56	92	0.17	207.0	3.13	
1010			39.17	16.58	4.57	91	0.17	206.3	3.21	← collect sample

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 3 - MW 3

Date: 6/21/13
Sampler: JB, KM
PID: ------

Start Time: 0810 **End Time:** 0950
Well Construction: 4"
Depth to Water: 37.88
Well Depth: 340'
Water Column: ~302.1
Total Volume Removed (L): ~34.0
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020 we	19964
QED	MP15	Rental
Marschalk Bladder Pump	24"	ID# 711

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0820	3.4	340	37.94	15.45	5.17	158	0.38	164.7	6.62	Clear
0825	1.7	340	37.94	15.38	5.18	160	0.32	161.1	7.42	"
0830		340	37.94	15.43	5.18	158	0.30	157.7	6.51	"
0835		340	37.94	15.65	5.19	158	0.29	154.6	6.49	"
0840		340	37.94	15.82	5.21	159	0.27	153.1	6.55	"
0845		340	37.94	15.95	5.21	159	0.25	152.6	6.69	"
0850		340	37.94	16.13	5.21	159	0.24	151.3	7.13	"
0855		340	37.94	16.02	5.20	159	0.24	148.6	8.16	"
0900		340	37.94	15.98	5.19	159	0.23	147.0	8.11	"
0905		340	37.94	16.14	5.20	158	0.21	144.2	7.15	"
0910		340	37.94	16.26	5.19	159	0.23	146.3	10.66	"
0915	V	340	37.94	16.24	5.20	160	0.22	144.7	7.79	"
	Acceptance Criteria:		<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
0950	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 3-MW 3- 062113	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228
		plus all addtl parameters			

Comments

H&S begins sampling @ 0950, finishes @ 1045
BWD begins sampling @ 1050, finishes @ 1145

Signature

6/21/13
Date

p 1/2

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 3 - MW 3

Date: 6/21/13
Sampler: JG/RM
PID: ------

Start Time: 0810 End Time: 0950
Well Construction: 4"
Depth to Water: 37.88'
Well Depth: 340'
Water Column: ~302.1'
Total Volume Removed (L): ~340
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020e WE	19964
QED	MP15	Rental
Marschalk Bladder Pump	24"	ID# 711

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0920	1.7	340	37.94	16.32	5.20	159	0.21	142.6	6.06	clear
0925	↓	340	37.94	16.36	5.20	159	0.20	141.2	6.55	clear
0930		340	37.94	16.22	5.19	159	0.19	141.6	6.50	clear
0935		340	37.94	16.28	5.20	160	0.18	141.0	6.74	clear
0940		340	37.94	16.29	5.19	160	0.18	140.5	5.92	Clear
0945		340	37.94	16.37	5.19	159	0.18	139.7	5.67	clear
0950	↓	340	37.94	16.47	5.19	159	0.18	138.9	6.13	clear
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
0950	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 3 -MW 3 - 062113	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228
		plus all addl parameters			

Comments

Signature

6/21/13
Date

p 2/2

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: RW 3 - MW 4

Date: 6/21/13
Sampler: JR, RM
PID: ------

Start Time: 0715 End Time: 0815
Well Construction: 4"
Depth to Water: 39.50
Well Depth: 495'
Water Column: 455.5
Total Volume Removed (L): ~20.4
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020we	19964
QED	MP15	EOR
Marschalk Bladder Pump	24"	ID# 6884

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
0720	1.7	340	39.49	15.17	4.10	186	0.86	232.5	6.63	Clear
0725	|	340	39.50	15.05	4.33	158	0.36	237.1	2.17	"
0730	|	340	39.51	14.97	4.08	151	0.32	233.4	3.91	clear
0735	|	340	39.51	15.00	4.07	177	0.38	234.4	6.74	"
0740	|	340	39.51	14.96	4.13	186	0.40	232.7	8.78	"
0745	|	340	39.51	14.99	4.21	185	0.40	229.6	4.22	"
0750	|	340	39.52	15.03	4.24	184	0.39	228.3	3.55	"
0755	|	340	39.52	15.05	4.28	185	0.39	226.5	3.99	"
0800	|	340	39.54	15.06	4.29	185	0.38	226.4	3.61	"
0805	|	340	39.54	15.05	4.30	184	0.38	226.4	3.28	"
0810	|	340	39.54	15.16	4.33	184	0.38	226.7	1.70	"
0815	V	340	39.54	15.15	4.33	184	0.37	226.8	2.30	"
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
0815	NWIRP-GM-38-GW-	40 mL CG	3	HCl	Select VOCs (524.2)
	RW 3 -MW4- 062113	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228
	+ All add'l parameters				

Comments

began sampling @ 0815, finish @ 0910, BWD begins sampling @ 0920, finishes @ 1005

Signature

6/21/13
Date

Equipment/ Rinsate/ Field Blank NWIRP-Bethpage GM38-GW-FB-01-062113 collected @ 1230 after decon pump

H&S Environmental, Inc.

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM-38
Location: Bethpage, NY
Well ID: TP1

Date: 6/17/13
Sampler: JG, RM
PID: ------

Start Time: 1252 End Time: 1340
Well Construction: 4"
Depth to Water: 34.60
Well Depth: 470'
Water Column: 435.4'
Total Volume Removed (L): ~11.3
Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556	10H100928
LaMotte	2020e	12295
QED	MP15	Rental
Marschalk Bladder Pump	24" 1/4x3/8 ID#	6584

Time (hh:mm)	Volume Removed (L)	Flow Rate (mL/min)	Depth to Water (ft)	Temp (°C)	pH (STD)	SPC (µS/cm°)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Color
1300 ~~1300~~	1.25	250	34.60	16.31	5.42	205	9.31	99.1	3.38	Clear
1305		250	34.60	15.65	5.53	202	8.78	97.3	2.57	"
1310		250	34.58	15.37	5.62	197	8.31	96.6	7.89	"
1315		250	34.58	15.62	5.71	190	7.92	91.7	8.93	"
1320		250	34.58	15.38	5.65	188	7.89	94.2	7.76	"
1325		250	34.58	15.05	5.50	188	7.20	105.0	6.80	"
1330		250	34.56	14.92	5.45	189	6.71	108.9	8.03	"
1335		250	34.57	14.91	5.46	189	6.65	110.5	7.31	"
1340		250	34.56	14.93	5.43	190	6.68	113.7	7.58	"
Acceptance Criteria:			<0.3ft	3%	±0.1	3%	10%	± 10mv	10%	

2" Screen Volume = 0.16 gal/ft
4" Screen Volume = 0.64 gal/ft
6" Screen Volume = 1.46 gal/ft

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
	NWIRP-GM-38-GW-TP1-	40 mL CG	3	HCl	TCL VOCs (624)
13:40	061713	250 mL PL	1	HNO_3	Hg (245.1)
		500 mL PL	1	---	TSS (SM2540D)
		1000 mL PL	1	HNO_3	Gross Alpha/Beta
		2000 mL PL	1	HNO_3	Radium 226/228

Comments

1/4 x 3/8"

Signature

6/17/13
Date

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/17/13 **Weather:** Sl. cloudy

Calibrated By: RM / JG **Instrument:** YSI 556 **Serial Number:** 10H100928

Parameters	Morning Calibration Time: 0705	Cal. Temperature °C	Afternoon Cal. Check Time: 19:25	Comments
Conductivity 1413 (µS/cm°)	1442 / 1413	23.96	1322 / 1413 / 27.87°	
pH (7)	7.06 / 7.00	23.60	6.95 / 7.00 / 27.76	
pH (4)	3.90 / 4.00	23.66	4.05 / 4.00 / 27.80	
pH (10)	9.98 / 10.00	23.85	10.06 / 10.00 / 27.90	
ORP 240 (mv)	251.1 / 240.0	23.70	239.4 / 240.0 / 27.87	
Dissolved Oxygen (%)	100.8 / 100.3	23.00	101.6 / 100.0 / 27.06°	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	766.0	—	764.5	

pH Check (Every 3 hrs): (NJ only)

Time:	Time:	Time:
Standard: NA	Standard: NA	Standard: NA
Reading:	Reading:	Reading:

Signature: [signature] Date: 6-17-13

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/18/13 **Weather:** Clear

Calibrated By: RM/JA **Instrument:** YSI 556 **Serial Number:** 10H100928

Parameters	Morning Calibration Time: 0720	Cal. Temperature °C	Afternoon Cal. Check Time: 16:25	Comments
Conductivity 1413 (µS/cm°)	1429 / 1413	21.84	13368 / 1413 / 25.7°C	
pH (7)	7.03 / 7.00	21.67	6.95 / 7.00 / 25.48°C	
pH (4)	4.00 / 4.00	21.91	4.03 / 4.00 / 25.48°C	
pH (10)	9.95 / 10.00	21.93	10.06 / 10.00 / 25.09°C	
ORP 240 (mv)	244.7 / 240.0	22.8	238.0 / 240.0 / 25.19	
Dissolved Oxygen (%)	103.7 / 100.1	21.78	96.8 / 100.0 / 26.29	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	765.7	—	764.2	

pH Check (Every 3 hrs): (NJ only)

Time:	Time:	Time:
Standard: NA	Standard: NA	Standard: NA
Reading:	Reading:	Reading:

Signature: [redacted] Date: 6-18-2013

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/19/13 **Weather:** clear

Calibrated By: RM **Instrument:** YSI 556 **Serial Number:** 11K100355

Parameters	Morning Calibration Time: 0625	Cal. Temperature °C	Afternoon Cal. Check Time: 1845	Comments
Conductivity 1413 (µS/cm°)	1414 / 1413	18.08	1378 / 1413 / 19.06	
pH (7)	7.03 / 7.00	18.83	7.05 / 7.00 / 19.11	
pH (4)	3.95 / 4.00	18.94	3.98 / 4.00 / 19.39	
pH (10)	9.96 / 10.00	21.03	9.90 / 10.00 / 19.47	
ORP 240 (mv)	244.7 / 240.0	20.58	242.2 / 240.0 / 19.51	
Dissolved Oxygen (%)	105.4 / 99.9	20.92	106.2 / 100.0 / 20.01	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	758.2	—		

pH Check (Every 3 hrs): (NJ only)

Time:	Time:	Time:
Standard: NA	Standard: NA	Standard: NA
Reading:	Reading:	Reading:

Signature: [signature] Date: 6-19-13

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/19/13 **Weather:** _____

Calibrated By: _____ **Instrument:** YSI 556 **Serial Number:** 10H100928

Parameters	Morning Calibration Time: 0825	Cal. Temperature °C	Afternoon Cal. Check Time: 1845	Comments
Conductivity 1413 (µS/cm°)	1460 / 1413	17.96	1407 / 1413 / 19.49°C	
pH (7)	7.02 / 7.00	18.46	7.17 / 7.00 / 19.48°C	
pH (4)	3.97 / 4.00	18.44	3.91 / 4.00 / 19.73°C	
pH (10)	9.94 / 10.00	20.59	9.74 / 10.00 / 19.98°C	
ORP 240 (mv)	252.5 / 240.0	19.85	224.9 / 240.0 / 19.24	
Dissolved Oxygen (%)	108.4 / 100.1	22.01	100.0 / 100.0 / 18.73	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	767.4	—	755.5	

pH Check (Every 3 hrs): (NJ only)

Time: Standard: NA Reading:

Time: Standard: NA Reading:

Time: Standard: NA Reading:

Signature: _____ Date: 6-19-13

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/20/13 **Weather:** Clear 64°F

Calibrated By: RM **Instrument:** YSI 556 **Serial Number:** 11K100355

Parameters	Morning Calibration Time: 0630	Cal. Temperature °C	Afternoon Cal. Check Time: 1830	Comments
Conductivity 1413 (µS/cm°)	1378 / 1413	19.06	1481 / 1413 / 23.54	
pH (7)	7.05 / 7.00	19.11	7.04 / 7.00 / 23.47	
pH (4)	3.98 / 4.00	19.39	4.04 / 4.00 / 23.82	
pH (10)	9.90 / 10.00	19.47	10.00 / 10.00 / 23.45	
ORP 240 (mv)	239.1 / 240.0	18.63	240.9 / 240.0 / 23.28	
Dissolved Oxygen (%)	98.0 / 100.8	18.16	82.3 / 99.8 / 22.57	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	~~755.5~~ 764.0	—	764.5	

pH Check (Every 3 hrs): (NJ only)

Time:	Time:	Time:
Standard: NA	Standard: NA	Standard: NA
Reading:	Reading:	Reading:

Signature: [signature] Date: 6-20-13

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/20/13 **Weather:** Clear 64°F

Calibrated By: RM **Instrument:** YSI 556 **Serial Number:** 10H100928

Parameters	Morning Calibration Time: 0630	Cal. Temperature °C	Afternoon Cal. Check Time: 18:30	Comments
Conductivity 1413 (µS/cm°)	1407 / 1413	19.49	1357 / 1414 / 21.21°C	
pH (7)	7.17 / 7.00	19.48	7.01 / 7.00 / 21.41°C	
pH (4)	3.91 / 4.00	19.73	4.04 / 4.00 / 21.47°C	
pH (10)	9.74 / 10.00	19.98	9.97 / 10.00 / 21.31°C	
ORP 240 (mv)	~~223.9~~ 224.9 / 240.0	19.24	237.3 / 240.0 / 20.72°C	
Dissolved Oxygen (%)	100.0 / 100.0	18.73	104.2 / 101.2 / 20.31°C	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	755.5	—	746.0	

pH Check (Every 3 hrs): (NJ only)

Time:	Time:	Time:
Standard: NA	Standard: NA	Standard: NA
Reading:	Reading:	Reading:

Signature: [signature] Date: 6-20-13

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/21/13 **Weather:** Clear 63°F

Calibrated By: RM **Instrument:** YSI 556 **Serial Number:** 11K100355

Parameters	Morning Calibration Time: 0620	Cal. Temperature °C	Afternoon Cal. Check Time: ~~1425~~ 1420	Comments
Conductivity 1413 (µS/cm°)	1403	20.71	1331 / 1413 / 25.7	
pH (7)	7.03 / 7.00	20.67	7.02 / 7.00 / 25.54	
pH (4)	4.03 / 4.02	21.09	4.06 / 4.00 / 25.48	
pH (10)	9.97 / 10.0	20.72	10.03 / 10.00 / 25.09	
ORP 240 (mv)	236.7 / 240.0	20.67	241.9 / 240.0 / 25.19	
Dissolved Oxygen (%)	97.3 / 101.2	20.33	100.2 / 100.0 / 26.29	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	767.4	—	757.3	

pH Check (Every 3 hrs): (NJ only)

Time: Standard: NA Reading:

Time: Standard: NA Reading:

Time: Standard: NA Reading:

Signature: [signature]

Date: 6/21/13

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage – GM-38 **Date:** 6/21/13 **Weather:** Clear 63°F

Calibrated By: RM **Instrument:** YSI 556 **Serial Number:** 10H100928

Parameters	Morning Calibration Time: 0620	Cal. Temperature °C	Afternoon Cal. Check Time: 14:20	Comments
Conductivity 1413 (µS/cm°)	1357 / 1413	21.21	1506 / 1413 / 24.95	
pH (7)	7.01 / 7.00	21.41	6.95 / 7.00 / 25.05	
pH (4)	4.04 / 4.00	21.47	3.93 / 4.00 / 25.83	
pH (10)	9.97 / 10.00	21.31	9.88 / 10.00 / 26.79	
ORP 240 (mv)	237.3 / 240.0	20.72	239.3 / 240.0 / 27.85	
Dissolved Oxygen (%)	104.2 / 101.2	20.31	94.2 / 101.8 / 31.62	
Zero Dissolved Oxygen (mg/L)	—	—	—	
Barometric Pressure (mmHg)	776.6	—	773.4	

pH Check (Every 3 hrs): (NJ only)

Time:	Time:	Time:
Standard: NA	Standard: NA	Standard: NA
Reading:	Reading:	Reading:

Signature: [signature] Date: 6/21/13

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage GM-38 **Calibrated By**: R mastrocola

Instrument/Serial Number	Pre-Cal 1-AM (NTU)	Pre-Cal 1-PM (NTU)	Pre-Cal 10-AM (NTU)	Pre-Cal 10-PM (NTU)	Post-Cal 1-AM (NTU)	Post-Cal 1-PM (NTU)	Post-Cal 10-AM (NTU)	Post-Cal 10-PM (NTU)	Date
LaMotte 2020e / ME~~15044~~12295	0.83	0.95	11.0	10.86	1.00	1.00	10.0	10.00	6-17-13 Time: 0645 & 1910
	0.96	0.97	10.7	9.98	1.00	1.00	10.0	10.00	6-18-13 Time: 0730 & 1625
	1.50	1.36	7.98	10.12	1.00	1.00	10.00	10.00	6-19-13 Time: 0740 & 1845
low Quality									~~6-20-13~~ Time: ~~0645~~ &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &

Signature: _____ Date: 6-19-13

H&S

Instrument Calibration Log

Project/Site Name: NWIRP Bethpage GM-38 **Calibrated By**: RM

Instrument/Serial Number	Pre-Cal 1-AM (NTU)	Pre-Cal 1-PM (NTU)	Pre-Cal 10-AM (NTU)	Pre-Cal 10-PM (NTU)	Post-Cal 1-AM (NTU)	Post-Cal 1-PM (NTU)	Post-Cal 10-AM (NTU)	Post-Cal 10-PM (NTU)	Date
LaMotte 2020~~e~~ we ME~~15044~~ 16994	0.97	0.93	10.30	9.81	1.00	1.00	10.00	10.00	6-19-13 Time: 0740 & 1845
	1.00	1.30	9.96	9.94	1.00	1.00	10.00	10.00	6-20-13 Time: 0645 & 1830
	~~1.00~~	0.98	11.08	10.60	1.00	1.00	10.00	10.00	6-21-13 Time: 0640 & 1625
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &

Signature: [signature] Date: 6-21-13

>>> Select a Laboratory Here <<<

#N/A
#N/A
#N/A
#N/A

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jen Good	Site Contact: Jen Good	Date: 6/19/13	COC No:
H&S Environmental, Inc.	Tel/Fax: 508-366-7442	Lab Contact: Deb Harbuck	Carrier:	1 of 1 COCs
160 E. Main St., Suite 2F	Analysis Turnaround Time			Job No. 2031-
Westborough, MA 01581	Calendar (C) or Work Days (W) _____			
508-366-7442 Phone	TAT if different from Below ___Standard___X___			
508-366-7445 FAX	☐ 2 weeks			SDG No
Project Name: NWIRP Bethpage GM-38 - June 2013 LTM	☐ 1 week			
Site: NWIRP Bethpage GM-38	☐ 2 days			
P O # 2031-	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	VOCs (524.2) - LTM project list	TSS (2540D)	Hg only (245.1)	Project Metals (200.8, 200.7, 245.1)	314.0	548.1	300 (Cl, F,SO4), (NO3,NO2)	508	515.1	549.2	SM4500NH3G (Ammonia)	2320B, SM-2330B	2340C, SM2340B	2120B, SM2150B	2540C	5540C	335.4	525.2	Sample Specific Notes:
NWIRP-Bethpage-GM-38-GW- RW1-MW1- 061913	6/19/13	1540	N	GW	24		3	1		1	1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-GW- RW1-MW2- 061813	6/18/13	1300	N	GW	3		3																		
NWIRP-Bethpage-GM-38-GW- RW1-MW3- 061913	6/19/13	1058	N	GW	24		3	1		1	1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-GW- RW2-MW1- 061713	6/17/13	1017	N	GW	5		3	1		1															
NWIRP-Bethpage-GM-38-GW- RW2-MW1- 061913	6/19/13	0815	N	GW	19						1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-GW- RW2-MW2- 061713	6/17/13	1830	N	GW	3		3																		
NWIRP-Bethpage-GM-38-GW- RW2-MW3- 061813	6/18/13	1010	N	GW	3		3																		
NWIRP-Bethpage-GM-38-GW- TP1- 061713	6/17/13	1340	N	GW	5		3	1	1																
NWIRP-Bethpage-GM-38-GW- IW1-MW1- 061813	6/18/13	1540	N	GW	3		3																		
NWIRP-Bethpage-GM-38-GW- TB01-					3		3																		

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification

☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* X

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ *Return To Client* X *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	H&S	6/19/13 1900			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

>>> Select a Laboratory Here <<<

#N/A
#N/A
#N/A
#N/A

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jen Good	Site Contact: Jen Good	Date: 6/ 19 /13	COC No:
H&S Environmental, Inc.	Tel/Fax: 508-366-7442	Lab Contact: Deb Harbuck	Carrier:	2 of 2 COCs
160 E. Main St., Suite 2F	Analysis Turnaround Time			Job No. 2031-
Westborough, MA 01581	Calendar (C) or Work Days (W) _____			
508-366-7442 Phone	TAT if different from Below ___Standard___X___			
508-366-7445 FAX	☐ 2 weeks			SDG No.
Project Name: NWIRP Bethpage GM-38 - June 2013 LTM	☐ 1 week			
Site: NWIRP Bethpage GM-38	☐ 2 days			
P O # 2031-	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	504.1	547	531.1	150.1	1613B	SM2130B	Sample Specific Notes:
NWIRP-Bethpage-GM-38-GW- RW1-MW1- 061913	6/19/13	1540	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-GW- RW1-MW2- 061813	6/18/13	1300	N	GW	0								
NWIRP-Bethpage-GM-38-GW- RW1-MW3- 061913	6/19/13	1058	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-GW- RW2-MW1- 061713	6/17/13	1017	N	GW	0								
NWIRP-Bethpage-GM-38-GW- RW2-MW1- 061913	6/19/13	0815	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-GW- RW2-MW2- 061713	6/17/13	1830	N	GW	0								
NWIRP-Bethpage-GM-38-GW- RW2-MW3- 061813	6/18/13	1010	N	GW	0								
NWIRP-Bethpage-GM-38-GW- TP1- 061713	6/17/13	1340	N	GW	0								
NWIRP-Bethpage-GM-38-GW- IW1-MW1- 061813	6/18/13	1540	N	GW	0								
NWIRP-Bethpage-GM-38-GW- TB01-					0								

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification

☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* X

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ *Return To Client* X *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	H+S	6/19/13 1900			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax 912.352.0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	**Project Manager: Jen Good**	**Site Contact: Jen Good**	**Date: 6/20 /13**	COC No:
H&S Environmental, Inc.	**Tel/Fax: 508-366-7442**	**Lab Contact: Deb Harbuck**	**Carrier:**	1 of 2 COCs
160 E. Main St., Suite 2F	**Analysis Turnaround Time**			Job No 2031-
Westborough, MA 01581	Calendar (C) or Work Days (W) _____			
508-366-7442 Phone	TAT if different from Below __Standard___X___			SDG No. 2
508-366-7445 FAX	☐ 2 weeks			
Project Name: NWIRP Bethpage GM-38 - June 2013 LTM	☐ 1 week			
Site: NWIRP Bethpage GM-38	☐ 2 days			
P O # 2031-	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	VOCs (524.2) - LTM project list	TSS (2540D)	Hg only (245.1)	Project Metals (200.8, 200.7, 245.1)	314.0	548.1	300 (Cl, F,SO4), (NO3,NO2)	508	515.1	549.2	SM4500NH3G (Ammonia)	2320B, SM-2330B	2340C, SM2340B	2120B, SM2150B	2540C	5540C	335.4	525.2	Sample Specific Notes:
NWIRP-Bethpage-GM-38-GW- RW3-MW1-062013	6/20/13	0836	N	GW	72		9	3		3	3	6	3	6	6	3	3	3	3	6	3	3	3	6	MS/MSD collected
NWIRP-Bethpage-GM-38-GW- RW3-MW2-062013	6/20/13	1010	N	GW	24		3	1		1	1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-GW- DUP01-062013	6/20/13	0000	N	GW	24		3	1		1	1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-PS- RW1 - 062013	6/20/13	1450	N	GW	5		3	1	1																
NWIRP-Bethpage-GM-38-PS- RW3 - 062013	6/20/13	1509	N	GW	5		3	1	1																
NWIRP-Bethpage-GM-38-GW- TB02-					3		3																		

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* X

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* X *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	H+S	6/20/13 1900			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax 912 352.0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jen Good	Site Contact: Jen Good	Date: 6/20/13	COC No:
H&S Environmental, Inc.	Tel/Fax: 508-366-7442	Lab Contact: Deb Harbuck	Carrier:	2 of 2 COCs
160 E. Main St., Suite 2F	Analysis Turnaround Time			Job No 2031-
Westborough, MA 01581	Calendar (C) or Work Days (W)			
508-366-7442 Phone	TAT if different from Below __Standard__ _X__			SDG No. 2
508-366-7445 FAX	☐ 2 weeks			
Project Name: NWIRP Bethpage GM-38 - June 2013 LTM	☐ 1 week			
Site: NWIRP Bethpage GM-38	☐ 2 days			
P O # 2031-	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	504.1	547	531.1	150.1	1613B	SM2130B	Sample Specific Notes:
NWIRP-Bethpage-GM-38-GW- RW3-MW1-062013	6/20/13	0836	N	GW	30		9	6	6	3	6	X	MS/MSD collected
NWIRP-Bethpage-GM-38-GW- RW3-MW2-062013	6/20/13	1010	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-GW- DUP01-062013	6/20/13	0000	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-PS- RW1 - 062013	6/20/13	1450	N	GW	0								
NWIRP-Bethpage-GM-38-PS- RW3 - 062013	6/20/13	1509	N	GW	0								
NWIRP-Bethpage-GM-38-GW- TB02-					0								

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* X

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* X *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	H&S	6/20/13 1900			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax 912.352.0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jen Good	Site Contact: Jen Good	Date: 6/21/13	COC No:
H&S Environmental, Inc.	Tel/Fax: 508-366-7442	Lab Contact: Deb Harbuck	Carrier:	1 of 2 COCs
160 E. Main St., Suite 2F	Analysis Turnaround Time			Job No. 2031-
Westborough, MA 01581	Calendar (C) or Work Days (W)			
508-366-7442 Phone	TAT if different from Below ___Standard ___X___			SDG No
508-366-7445 FAX	☐ 2 weeks			
Project Name: NWIRP Bethpage GM-38 - June 2013 LTM	☐ 1 week			
Site: NWIRP Bethpage GM-38	☐ 2 days			
P O # 2031-	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	VOCs (524.2) - LTM project list	TSS (2540D)	Hg only (245.1)	Project Metals (200.8, 200.7, 245.1)	314.0	548.1	300 (Cl, F,SO4), (NO3,NO2)	508	515.1	549.2	SM4500NH3G (Ammonia)	2320B, SM-2330B	2340C, SM2340B	2120B, SM2150B	2540C	5540C	335.4	525.2	Sample Specific Notes:
NWIRP-Bethpage-GM-38-GW- RW3-MW3-062113	6/21/13	0950	N	GW	24		3	1		1	1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-GW- RW3-MW4-062113	6/21/13	0815	N	GW	24		3	1		1	1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-GW- FB01-062113	6/21/13	1230	N	GW	24		3	1		1	1	2	1	2	2	1	1	1	1	2	1	1	1	2	
NWIRP-Bethpage-GM-38-GW- TB03-					3		3																		

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* X

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* X *Disposal By Lab* ☐ *Archive For* _____ *Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	H+S	6/21/13 1600			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Savannah
5102 LaRoche Avenue

Savannah, GA 31404
phone 912.354.7858 fax 912.352.0165

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jen Good	Site Contact: Jen Good	Date: 6/21/13	COC No:
H&S Environmental, Inc.	Tel/Fax: 508-356-7442	Lab Contact: Deb Harbuck	Carrier:	2 of 2 COCs 2
160 E. Main St., Suite 2F	Analysis Turnaround Time			Job No. 2031-
Westborough, MA 01581	Calendar (C) or Work Days (W) _____			
508-366-7442 Phone	TAT if different from Below ___Standard___X___			SDG No.
508-366-7445 FAX	☐ 2 weeks			
Project Name: NWIRP Bethpage GM-38 - June 2013 LTM	☐ 1 week			
Site: NWIRP Bethpage GM-38	☐ 2 days			
P O # 2031-	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	504.1	547	531.1	150.1	1613B	SM2130B	Sample Specific Notes:
NWIRP-Bethpage-GM-38-GW- RW3-MW3-062113	6/21/13	0950	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-GW- RW3-MW4-062113	6/21/13	0815	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-GW- FB01-062113	6/21/13	1230	N	GW	10		3	2	2	1	2	X	
NWIRP-Bethpage-GM-38-GW- TB03-					0								

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* X

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* X *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	T+S	6/21/13 1600			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

APPENDIX D

DATA VALIDATION REPORTS

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

Memorandum

Date: 29 August 2013

To: Jen Good

From: Mary Tyler

CC: J. Caprio

Subject: Stage 2B Data Validation - Level IV Data Deliverable – Volatile Organic Compounds by EPA Method 524.2 - TestAmerica Job ID 680-91555-1

SITE: NWIRP Bethpage GM-38, June 2013 LTM

INTRODUCTION

This report summarizes the findings of the Stage 2B data validation of nine groundwater samples and one trip blank collected on June 17-19, 2013, as part of the NWIRP Bethpage GM-38, June 2013 LTM sampling event. The following analysis was performed at TestAmerica, Savannah, Georgia:

- Volatile Organic Compounds (VOCs) by EPA Method 524.2

EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Based on this Stage 2B data validation covering the quality control (QC) parameters listed below, the data are usable for meeting project objectives.

The organic data were reviewed based on the information and/or guidance provided in the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), UFP-SAP for Operations, Maintenance, and Monitoring of the Groundwater Treatment Plant GM-38 Area, Naval Weapons Industrial Reserve Plant Bethpage, New York, September 30, 2010 (here after referred to as the QAPP), Section 4.0 from the Final Operations, Maintenance and Monitoring (OM&M) Manual for Groundwater Treatment Plant (GWTP) GM-38 Area Groundwater Remediation at Former Naval Industrial Reserve Plant, Bethpage, NY (TtEC 2010), Contract Laboratory Program National Functional Guidelines for Superfund Organic

Methods Data Review, June 2008 (USEPA-540-R-08-01), USEPA Region 2 Validation Guidance, Standard Operating Procedure (SOP) HW-33, Revision 3, March 2013, as well as by the pertinent methods referenced by the data package and professional judgment.

The following samples were analyzed in the data set:

Laboratory ID	Client ID
680-91555-1	NWIRP-Bethpage-GM-38-GW-RW1-MW1-061913
680-91555-2	NWIRP-Bethpage-GM-38-GW-RW1-MW2-061813
680-91555-3	NWIRP-Bethpage-GM-38-GW-RW1-MW3-061913
680-91555-4	NWIRP-Bethpage-GM-38-GW-RW2-MW1-061713
680-91555-5	NWIRP-Bethpage-GM-38-GW-RW2-MW1-061913
680-91555-6	NWIRP-Bethpage-GM-38-GW-RW2-MW2-061713

Laboratory ID	Client ID
680-91555-7	NWIRP-Bethpage-GM-38-GW-RW2-MW3-061813
680-91555-8	NWIRP-Bethpage-GM-38-GW-TP1-061713
680-91555-9	NWIRP-Bethpage-GM-38-GW-IW1-MW1-061813
680-91555-10	NWIRP-Bethpage-GM-38-GW-TB01

The samples were received at the laboratory within the QAPP criteria of 2-6^{o}C.

The trip blank was listed on the COC, but the time and date of collection were not listed. The laboratory assigned date and time of collection of 6/19/13, 00:00.

1.0 VOLATILE ORGANIC COMPOUNDS

Eight groundwater samples and one trip blank were analyzed for VOCs per EPA Method 524.2.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Instrument Performance Check
- ✓ Initial Calibration
- ✓ Continuing Calibration Verification
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates

- ✓ Trip Blank
- ✓ Field Blank
- ✓ Field Duplicate
- ✓ Internal Standards
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The VOC data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

1.2 Holding Times

The holding time for a preserved water sample is 14 days from collection to analysis. The holding times were met for the sample analyses.

1.3 Instrument Performance Check

An instrument performance check sample (tune standard) was analyzed at the beginning of each 12-hour period during sample analysis. The samples were analyzed within the 12-hour period. The method ion abundance criteria were met for bromofluorobenzene (BFB).

1.4 Initial Calibration

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated percent relative standard deviation (%RSD) of the relative response factors (RRFs) or the coefficient of determination (r^2) for the curve fit calibrations. For the target analytes, the %RSDs were within the method and validation criteria for the target compounds or the coefficient of determination was greater than or equal to 0.990 for the curve fit calibrations. The target analyte RRFs were above the validation minimum RRF criteria.

1.5 Continuing Calibration Verification (CCV)

For the target analytes, the CCVs were performed at the required frequency. The percent differences (%Ds) between the RRFs in the initial and continuing calibration standards for the

target analytes were within the method and validation acceptance criteria. The target analyte RRFs were above the validation minimum RRF criteria.

1.6 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 282000 and 282457). VOCs were not detected in the method blanks above the detection limits (DLs).

1.7 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported.

1.8 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS/LCS duplicate (LCSD) pairs were analyzed. The results for the LCS/LCSD pairs were within the method specified acceptance criteria for recovery and relative percent difference (RPD).

1.9 Surrogates

Acceptable surrogate recoveries were reported for the sample analyses.

1.10 Trip Blank

A trip blank, NWIRP-Bethpage-GM-38-GW-TB01, was submitted with the samples. VOCs were not detected in the trip blank above the DLs.

1.11 Field Blank

A field blank was not collected with this sample set. A field blank, NWIRP-Bethpage-GM-38-GW-FB01-062113, was collected with the samples reported in 680-91660-1. Acetone and methylene chloride were detected in the field blank at estimated concentrations less than the limits of quantitation (LOQs) and greater than the DLs. Since acetone and methylene chloride were not detected in the associated samples in this sample set, no qualifications were applied to the data.

1.12 Field Duplicate

A field duplicate sample was not collected with the sample set.

1.13 Internal Standards

The internal standard areas and retention times were within method specified acceptance criteria.

1.14 Sensitivity

The samples were reported to the DLs. Elevated DLs were reported for samples NWIRP-Bethpage-GM-38-GW-RW1-MW1-061913, NWIRP-Bethpage-GM-38-GW-RW1-MW2-061813 and NWIRP-Bethpage-GM-38-GW-RW2-MW3-061813 due to the samples being analyzed at dilution.

The DLs met the project quantitation limit goals in Worksheet 15 of the QAPP. The LOQs met the project action limits in Worksheet 15 of the QAPP, with the following exceptions.

Compound	Project Action Limit (µg/L)	Laboratory LOQ (µg/L)
cis-1,3-dichloropropene	0.4	0.5
Trans-1,3-dichloropropene	0.4	0.5

It was noted that the following compounds were listed in worksheet 15, but not reported by the laboratory: Dichlorodifluoromethane, trichlorofluoromethane, carbon disulfide, methyl acetate, methyl tert-butyl ether, bromochloromethane, cyclohexane, methylcyclohexane, 1,2-dibromoethane, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene.

1.15 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated Level IV report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the Level IV report and the EDD.

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* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

Memorandum

Date: 29 August 2013

To: Jen Good

From: Mary Tyler

CC: J. Caprio

Subject: Stage 2B Data Validation - Level IV Data Deliverable – Volatile Organic Compounds by EPA Method 524.2 - TestAmerica Job ID 680-91609-1

SITE: NWIRP Bethpage GM-38, June 2013 LTM

INTRODUCTION

This report summarizes the findings of the Stage 2B data validation of four groundwater samples, one field duplicate sample and one trip blank collected on June 20, 2013, as part of the NWIRP Bethpage GM-38, June 2013 LTM sampling event. The following analysis was performed at TestAmerica, Savannah, Georgia:

- Volatile Organic Compounds (VOCs) by EPA Method 524.2

EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Based on this Stage 2B data validation covering the quality control (QC) parameters listed below, the data as are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the information and/or guidance provided in the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), UFP-SAP for Operations, Maintenance, and Monitoring of the Groundwater Treatment Plant GM-38 Area, Naval Weapons Industrial Reserve Plant Bethpage, New York, September 30, 2010 (here after referred to as the QAPP), Section 4.0 from the Final Operations, Maintenance and Monitoring (OM&M) Manual for Groundwater Treatment Plant (GWTP) GM-38 Area Groundwater Remediation at Former Naval Industrial Reserve Plant, Bethpage, NY (TtEC

2010), Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), USEPA Region 2 Validation Guidance, Standard Operating Procedure (SOP) HW-33, Revision 3, March 2013, as well as by the pertinent methods referenced by the data package and professional judgment.

The following samples were analyzed in the data set:

Laboratory ID	Client ID
680-91609-1	NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013
680-91609-2	NWIRP-Bethpage-GM-38-GW-RW3-MW2-062013
680-91609-3	NWIRP-Bethpage-GM-38-GW-DUP01-062013
680-91609-4	NWIRP-Bethpage-GM-38-PS-RW1-062013

Laboratory ID	Client ID
680-91609-5	NWIRP-Bethpage-GM-38-PS-RW3-062013
680-91609-6	NWIRP-Bethpage-GM-38-GW-TB02

The samples were received at the laboratory within the QAPP criteria of 2-6^{o}C.

The trip blank was listed on the COC, but the time and date of collection were not listed. The laboratory assigned date and time of collection of 6/20/13, 00:00.

1.0 VOLATILE ORGANIC COMPOUNDS

Four groundwater samples, one field duplicate sample and one trip blank were analyzed for VOCs per EPA Method 524.2.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Instrument Performance Check
- ✓ Initial Calibration
- ✓ Continuing Calibration Verification
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Trip Blank
- ✓ Field Blank

⊗ Field Duplicate
✓ Internal Standards
⊗ Sensitivity
✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The VOC data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

1.2 Holding Times

The holding time for a preserved water sample is 14 days from collection to analysis. The holding times were met for the sample analyses.

1.3 Instrument Performance Check

An instrument performance check sample (tune standard) was analyzed at the beginning of each 12-hour period during sample analysis. The samples were analyzed within the 12-hour period. The method ion abundance criteria were met for bromofluorobenzene (BFB).

1.4 Initial Calibration

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated percent relative standard deviation (%RSD) of the relative response factors (RRFs) or the coefficient of determination (r^2) for the curve fit calibrations. For the target analytes, the %RSDs were within the method and validation criteria for the target compounds or the coefficient of determination was greater than or equal to 0.990 for the curve fit calibrations. The target analyte RRFs were above the validation minimum RRF criteria.

1.5 Continuing Calibration Verification (CCV)

For the target analytes, the CCVs were performed at the required frequency. The percent differences (%Ds) between the RRFs in the initial and continuing calibration standards for the target analytes were within the method and validation acceptance criteria. The target analyte RRFs were above the validation minimum RRF criteria.

1.6 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 282694 and 282894). VOCs were not detected in the method blanks above the detection limits (DLs).

1.7 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). A sample set specific MS/MSD pair, using sample NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013, was reported. The MS/MSD pair had recovery and relative percent difference (RPD) results within the method specified acceptance criteria.

A batch MS/MSD pair was also reported. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the samples.

1.8 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS/LCS duplicate (LCSD) pairs were analyzed. The results for the LCS/LCSD pairs were within the method specified acceptance criteria for recovery and RPD.

1.9 Surrogates

Acceptable surrogate recoveries were reported for the sample analyses.

1.10 Trip Blank

A trip blank, NWIRP-Bethpage-GM-38-GW-TB02, was submitted with the samples. VOCs were not detected in the trip blank above the DLs.

1.11 Field Blank

A field blank was not collected with this sample set. A field blank, NWIRP-Bethpage-GM-38-GW-FB01-062113, was collected with the samples reported in 680-91660-1. Acetone and methylene chloride were detected in the field blank at estimated concentrations less than the limits of quantitation (LOQs) and greater than the DLs. Since acetone and methylene chloride

were not detected in the associated samples in this sample set, no qualifications were applied to the data.

1.12 Field Duplicate

A field duplicate sample, NWIRP-Bethpage-GM-38-GW-DUP01-062013, was collected with the sample set. Acceptable precision (RPD <50%) was demonstrated between the field duplicate and the original sample NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013, with the following exception.

Trichlorotrifluoroethane was detected at an estimated concentration greater than the DL and less than the LOQ in the original sample and not detected in the field duplicate, resulting in a noncalculable RPD between the results. Therefore, based on professional judgment, the detected concentration of tichlorotrifluoroethane was J qualified as estimated and the undetected value was UJ qualified as estimated less than the DL in the field duplicate pair.

Sample ID	Compound	Laboratory Concentration (mg/L)	Laboratory Flag	RPD	Validation Concentration (mg/L)	Validation Qualification	Reason Code
NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013	Tetrachloroethene	0.0018	J D	NC	NA	NA	NA
NWIRP-Bethpage-GM-38-GW-DUP01-062013	Tetrachloroethene	0.0017	J D		NA	NA	NA
NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013	Trichloroethene	0.049	D	2	NA	NA	NA
NWIRP-Bethpage-GM-38-GW-DUP01-062013	Trichloroethene	0.048	D		NA	NA	NA
NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013	Trichloro-trifluoroethane	0.0008	J D	NC	0.0008	J	7
NWIRP-Bethpage-GM-38-GW-DUP01-	Trichloro-trifluoroethane	0.00075	U		0.00075	UJ	7

Sample ID	Compound	Laboratory Concentration (mg/L)	Laboratory Flag	RPD	Validation Concentration (mg/L)	Validation Qualification	Reason Code
062013							
NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013	The other VOCs	ND	NA	0	NA	NA	NA
NWIRP-Bethpage-GM-38-GW-DUP01-062013	The other VOCs	ND	NA		NA	NA	NA

J-estimated concentration less than the LOQ and greater than the DL
D-the reported value is from a dilution
U-not detected at the stated DL
ND-not detected at the DL
NC-not calculable
NA-not applicable

1.13 Internal Standards

The internal standard areas and retention times were within method specified acceptance criteria.

1.14 Sensitivity

The samples were reported to the DLs. Elevated DLs were reported for samples NWIRP-Bethpage-GM-38-GW-RW3-MW1-062013, NWIRP-Bethpage-GM-38-GW-RW3-MW2-062013, NWIRP-Bethpage-GM-38-GW-DUP01-062013, NWIRP-Bethpage-GM-38-PS-RW1-062013 and NWIRP-Bethpage-GM-38-PS-RW3-062013 due to the samples being analyzed at dilution.

The DLs met the project quantitation limit goals in Worksheet 15 of the QAPP. The LOQs met the project action limits in Worksheet 15 of the QAPP, with the following exceptions.

Compound	Project Action Limit (µg/L)	Laboratory LOQ (µg/L)
cis-1,3-dichloropropene	0.4	0.5
Trans-1,3-dichloropropene	0.4	0.5

It was noted that the following compounds were listed in worksheet 15, but not reported by the laboratory: Dichlorodifluoromethane, trichlorofluoromethane, carbon disulfide, methyl acetate,

methyl tert-butyl ether, bromochloromethane, cyclohexane, methylcyclohexane, 1,2-dibromoethane, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene.

1.15 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated Level IV report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the Level IV report and the EDD.

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* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

Memorandum

Date: 29 August 2013

To: Jen Good

From: Mary Tyler

CC: J. Caprio

Subject: Stage 2B Data Validation - Level IV Data Deliverable – Volatile Organic Compounds by EPA Method 524.2 - TestAmerica Job ID 680-91660-1

SITE: NWIRP Bethpage GM-38, June 2013 LTM

INTRODUCTION

This report summarizes the findings of the Stage 2B data validation of two groundwater samples, one field blank and one trip blank collected on June 21, 2013, as part of the NWIRP Bethpage GM-38, June 2013 LTM sampling event. The following analysis was performed at TestAmerica, Savannah, Georgia:

- Volatile Organic Compounds (VOCs) by EPA Method 524.2

EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Based on this Stage 2B data validation covering the quality control (QC) parameters listed below, the data are usable for meeting project objectives.

The organic data were reviewed based on the information and/or guidance provided in the Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan), UFP-SAP for Operations, Maintenance, and Monitoring of the Groundwater Treatment Plant GM-38 Area, Naval Weapons Industrial Reserve Plant Bethpage, New York, September 30, 2010 (here after referred to as the QAPP), Section 4.0 from the Final Operations, Maintenance and Monitoring (OM&M) Manual for Groundwater Treatment Plant (GWTP) GM-38 Area Groundwater Remediation at Former Naval Industrial Reserve Plant, Bethpage, NY (TtEC 2010), Contract Laboratory Program National Functional Guidelines for Superfund Organic

Methods Data Review, June 2008 (USEPA-540-R-08-01), USEPA Region 2 Validation Guidance, Standard Operating Procedure (SOP) HW-33, Revision 3, March 2013, as well as by the pertinent methods referenced by the data package and professional judgment.

The following samples were analyzed in the data set:

Laboratory ID	Client ID
680-91660-1	NWIRP-Bethpage-GM-38-GW-RW3-MW3-062113
680-91660-2	NWIRP-Bethpage-GM-38-GW-RW3-MW4-062113
680-91660-3	NWIRP-Bethpage-GM-38-GW-FB01-062113

Laboratory ID	Client ID
680-91660-4	NWIRP-Bethpage-GM-38-GW-TB03 (LOT # PWF194AB)

The samples were received at the laboratory within the QAPP criteria of 2-6^{o}C.

The trip blank was listed on the COC, but the time and date of collection were not listed. The laboratory assigned date and time of collection of 6/21/13, 00:00.

1.0 VOLATILE ORGANIC COMPOUNDS

Two groundwater samples, one field blank and one trip blank were analyzed for VOCs per EPA Method 524.2.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Instrument Performance Check
- ✓ Initial Calibration
- ✓ Continuing Calibration Verification
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Trip Blank
- ✓ Field Blank
- ✓ Field Duplicate
- ✓ Internal Standards

⊗ Sensitivity
✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The VOC data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

1.2 Holding Times

The holding time for a preserved water sample is 14 days from collection to analysis. The holding times were met for the sample analyses.

1.3 Instrument Performance Check

An instrument performance check sample (tune standard) was analyzed at the beginning of each 12-hour period during sample analysis. The samples were analyzed within the 12-hour period. The method ion abundance criteria were met for bromofluorobenzene (BFB).

1.4 Initial Calibration

Appropriate initial calibrations were performed for each analyte. Based on the method of calibration, the laboratory calculated percent relative standard deviation (%RSD) of the relative response factors (RRFs) or the coefficient of determination (r^2) for the curve fit calibrations. For the target analytes, the %RSDs were within the method and validation criteria for the target compounds or the coefficient of determination was greater than or equal to 0.990 for the curve fit calibrations. The target analyte RRFs were above the validation minimum RRF criteria.

1.5 Continuing Calibration Verification (CCV)

For the target analytes, the CCVs were performed at the required frequency. The percent differences (%Ds) between the RRFs in the initial and continuing calibration standards for the target analytes were within the method and validation acceptance criteria. The target analyte RRFs were above the validation minimum RRF criteria.

1.6 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 282090 and 282457). VOCs were not detected in the method blanks above the detection limits (DLs).

1.7 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported.

1.8 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS/LCS duplicate (LCSD) pairs were analyzed. The results for the LCS/LCSD pairs were within the method specified acceptance criteria for recovery and relative percent difference (RPD).

1.9 Surrogates

Acceptable surrogate recoveries were reported for the sample analyses.

1.10 Trip Blank

A trip blank, NWIRP-Bethpage-GM-38-GW-TB03 (LOT # PWF194AB), was submitted with the samples. VOCs were not detected in the trip blank above the DLs.

1.11 Field Blank

A field blank, NWIRP-Bethpage-GM-38-GW-FB01-062113, was collected with the sample set. Acetone and methylene chloride were detected in the field blank at estimated concentrations less than the limits of quantitation (LOQs) and greater than the DLs. Since acetone and methylene chloride were not detected in the associated samples, no qualifications were applied to the data.

1.12 Field Duplicate

A field duplicate sample was not collected with the sample set.

1.13 Internal Standards

The internal standard areas and retention times were within method specified acceptance criteria.

1.14 Sensitivity

The samples were reported to the DLs. Elevated DLs were reported for sample NWIRP-Bethpage-GM-38-GW-RW3-MW3-062113 due to the dilution analyzed.

The DLs met the project quantitation limit goals in Worksheet 15 of the QAPP. The LOQs met the project action limits in Worksheet 15 of the QAPP, with the following exceptions.

Compound	Project Action Limit (µg/L)	Laboratory LOQ (µg/L)
cis-1,3-dichloropropene	0.4	0.5
Trans-1,3-dichloropropene	0.4	0.5

It was noted that the following compounds were listed in worksheet 15, but not reported by the laboratory: Dichlorodifluoromethane, trichlorofluoromethane, carbon disulfide, methyl acetate, methyl tert-butyl ether, bromochloromethane, cyclohexane, methylcyclohexane, 1,2-dibromoethane, isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene.

1.15 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated Level IV report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the Level IV report and the EDD.

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ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference