

**Quarterly Operations Report
First Quarter 2019**

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

**Contract No. N40085-16-D-2288
Contract Task Order No. 0005**

October 2019

Prepared for:



Naval Facilities Engineering Command Mid-Atlantic
9324 Virginia Avenue
Norfolk, VA 23511

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Acronyms and Abbreviations

AOP	Advanced Oxidation Process
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
EB	equipment rinsate blank
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Accreditation Program
GOCO	Government Owned Contractor Operated
gpm	gallon per minute
GWTP	groundwater treatment plant
HMI	human-machine interface
IRP	Installation Restoration Program
KGS	KOMAN Government Solutions, LLC
lb	pound
LGAC	liquid-phase granular activated carbon
MS/MSD	matrix spike/matrix spike duplicate
NAVFAC	Naval Facilities Engineering Command Mid-Atlantic
Navy	U.S. Department of the Navy
NELAC	National Environmental Accreditation Conference
NG	Northrop Grumman
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health

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
TIC	tentatively identified compound
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

KOMAN Government Solutions, LLC (KGS) 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. N40085-16-D-2288, Contract Task Order No. 0005. This First Quarter 2019 Operations Report details activities that occurred from January to March 2019. Data was collected and operational activities were performed by KGS 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). In the late 1990s, 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 was bordered on the north, west, and south by property owned, or formerly owned, by NG that covered approximately 550 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 NG 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

Currently, groundwater is extracted from recovery wells RW-1 and RW-3 (pumping at RW-3 was suspended from July 2015 to June 2018 as described below) 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) Equivalent Application as an Applicable or Relevant and Appropriate Requirement (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 contamination in the GM-38 Area groundwater. 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 VC, are removed via two 20,000-pound (lb) vapor phase granular activated carbon (VGAC) units (VGAC-1 and VGAC-2). VC 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 subsequently 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 and 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.

A 2014 evaluation of the GM-38 Area, conducted in order to better determine the capture zone of the recovery wells, recommended that use of recovery well RW-3 be discontinued (*Capture Zone Evaluation and Path Forward, GM-38 Area Groundwater Treatment Plant* [Tetra Tech 2014]). The report was sent to NYSDEC in March 2014 and recommended ceasing operation of recovery well RW-3 and increasing the pumping rate of recovery well RW-1. These system modifications would maintain the existing GWTP pumping rate of 1,000 to 1,100 gpm while maintaining the desired capture zone of the GWTP (Tetra Tech 2014). NYSDEC concurred with the implementation of this path forward and associated system modifications on 20 April 2015. On 1 July 2015, in accordance with the approved path forward, recovery well RW-3 was taken off-line. The flowrate of recovery well RW-1 was increased from approximately 800 gpm to approximately 1,000 gpm. Pumping at RW-3 was once again resumed in June 2018 to address persisting VOC concentrations at this well. Pumping rates were adjusted so that approximately 80% of the total groundwater extracted is from RW-1 with the remaining 20% extracted from RW-3.

2.0 GWTP OPERATIONS AND MAINTENANCE

While designed to run completely automated, the GWTP requires regular 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 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 the First Quarter:

- On 5 February, the annual backflow preventer inspection was performed. Results were submitted to the Bethpage Water District and the New York State Department of Health (NYSDOH), as required.
- On 11 February, the operator backwashed the GAC vessels.

2.2 Non-routine Maintenance / Site Activities

The following non-routine activities occurred during the First Quarter:

- On 8 January, KGS staffs attended an onsite training of the upgraded SCADA system and remote access.
- On 18 January, the Advanced Oxidation Process (AOP) experimental treatment unit for 1,4-dioxane was delivered on site and installation was subsequently completed by others.

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 semi-annually 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 documented in the NYSDEC Water Division SPDES Equivalent Application for the effluent limitations and monitoring requirements. These results are also submitted to NYSDEC on a monthly basis in the form of a Discharge Monitoring Report (DMR). A copy of the current NYSDEC effluent limitations, monitoring constituents, and the reporting forms are included in **Appendix A**.

Monthly aqueous samples are collected from the active recovery well, RW-1, RW-3, and 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 First Quarter are presented in **Table 1**. The data demonstrate that all permitted constituents were in compliance with regulatory requirements during the First 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 First Quarter. Monthly DMRs for the First Quarter (January – March 2019) are included in **Appendix A**.

Based on NYSDEC's interest with several non-VOC parameters in groundwater near Bethpage Water District Plant 4, the Navy has agreed to sample and analyze groundwater for 1,4-dioxane (USEPA Method 8270D) on a monthly basis from the system's treated effluent. Analytical results for 1,4-dioxane are provided as **Table 1**. In addition, groundwater samples are collected and analyzed for radium 226 and radium 228 (USEPA Method 903.1 and 904.0/9320) on an annual basis from RW-1, RW-3 and the system's treated effluent. Radium analytical results from the March 2019 and previous sampling events are presented in **Table 2**.

3.2 Air Quality Monitoring

Treated off-gas discharged at the stack of the GWTP is subject to emissions limitations. Original discharge goals were derived from calculations submitted by the Navy and approved by the NYSDEC Division of Air Resources (DAR) in July 2009. In November 2011, the Navy submitted an evaluation proposing revised discharge goals, which NYSDEC approved in October 2013. A copy of this documentation 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 First Quarter are presented in **Table 3**. Air emissions calculations using the stack vapor concentrations along with discharge flowrates are presented in **Table 4**. The calculations demonstrate that all constituents were within the regulatory requirements during the First Quarter based on the calculated emission rates.

3.3 Groundwater Quality Monitoring

The groundwater monitoring well system at the GM-38 Groundwater Remediation Area consists of fourteen monitoring wells, three recovery wells (RW-1, RW-2, RW-3) and one injection well (IW-1). Groundwater level measurements were collected prior to sampling and are summarized in **Table 5**. 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. As mentioned above, pumping at RW-3 was suspended between July 2015 and June 2018. RW-3 was reactivated on 1 June 2018 to address persistent VOC concentrations at this location. Well locations are depicted on **Figure 3**.

Depth to water (DTW) measurements are collected from twelve of the monitoring wells on a quarterly basis. Prior to 2014, water quality samples were collected from eight of the monitoring wells on a quarterly basis; beginning in 2014, the sample collection frequency was reduced to semi-annually, with sample collection generally in the March and September time-frame. 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.

Semi-annual groundwater samples are collected from eight monitoring wells (RW1-MW1, RW1-MW3, RW2-MW1, RW3-MW1, RW3-MW2, RW3-MW3, RW3-MW4, and TP-01) and from two recovery wells (RW-1 and RW-3). Samples are collected from monitoring wells using bladder pumps in accordance with the U.S. Environmental Protection Agency (USEPA) low-flow sampling methodologies. Samples are collected from recovery wells RW-1 and RW-3 using the dedicated extraction pump as it is normally done during routine O&M sampling. Results of the groundwater sampling for the First 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.

Recovery Well 2 (RW-2) Monitoring Wells

The RW-2 cluster consists of three monitoring wells screened between 470 and 510 feet bgs. RW2-MW1 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 RW2-MW1 is monitored for water quality.

Recovery Well 3 (RW-3) Monitoring Wells

The RW-3 cluster consists of four monitoring wells. RW3-MW2 and RW3-MW4 are screened between 475 and 495 feet bgs. RW3-MW1 and RW3-MW3 are screened between 330 and 350 feet bgs and 320 and 340 feet 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.

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.

Injection Well 1 (IW-1) Monitoring Well

There is one monitoring well associated with injection well IW-1. IW1-MW1 is screened between 20 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

KGS collected groundwater samples for the First Quarter on 5-7 March 2019. Field parameters measured during well purging, which consisted of pH, specific conductance (SC), temperature, oxidation-reduction potential (ORP), dissolved oxygen (DO), and turbidity are summarized in **Table 6**. 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 (including tentatively identified compounds [TICs]) via USEPA Method 624, mercury via USEPA Method 245.1, total suspended solids (TSS) via USEPA Method SM20 2540D, and 1,4-dioxane via USEPA Method 8270D. Validated analytical sampling results collected during the First Quarter Monitoring Event are summarized in **Table 7**. 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 First Quarter Monitoring Event in accordance with the *Final Sampling and Analysis Plan* (TtEC 2010a). These samples consisted of blind field duplicates (collected from RW3-MW3 during the First 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. No contaminants were detected in the equipment blank or trip blank submitted for this event. The overall absence 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 First Quarter Monitoring Event are presented in the data validation report in **Appendix D**. As indicated, RPDs for all analytes were well 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 First Quarter are presented in **Table 8**. Groundwater analytical results of select VOCs (cis-1,2-DCE, PCE, TCE, and VC) for the First Quarter Monitoring Event 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) for each recovery well and the eight monitoring wells sampled during the First Quarter 2019 Monitoring Event are presented in **Figures 5 through 14** and discussed below.

Figure 5 presents concentrations measured at recovery well RW-1. Concentrations of TCE have decreased from initial concentrations in early 2010 (747 µg/L detected in April 2010), remaining below 300 µg/L since the latter half of 2012 and decreasing to a low of 69.9 µg/L in February 2019. 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 4.36 µg/L in March 2019. PCE concentrations have also exhibited decreasing trends over time, with concentrations decreasing from 180 µg/L in February 2010 to a low of 16.2 µg/L in February 2019. 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 and below 1.0 µg/L since June 2013. Vinyl chloride was not detected during the First Quarter 2019.

Figure 6 presents concentrations measured at recovery well RW-3. Concentrations of TCE have decreased from initial concentrations in February 2010 (660 µg/L), remaining below 300 µg/L from the latter half of 2012 through the Third Quarter 2015. RW-3 was taken off-line from 1 July 2015 until 1 June 2018, which may have contributed to the increased concentrations in 2016. However, since March 2016, TCE concentrations have decreased from 371 µg/L down to a low of 120 µg/L detected in March 2018 but have risen slightly to an average concentration of 154 µg/L during the First Quarter 2019. Concentrations of cis-1,2-DCE have consistently remained below 4.0 µg/L, and below 2.0 µg/L since September 2013, though the concentration increased slightly to 2.4 µg/L in March 2016, then decreased again below 2.0 µg/L since June 2018. PCE has only been detected infrequently at this location, with the most recent detection of 0.23 µg/L in March 2019. Vinyl chloride has not been detected during any monitoring event.

Figure 7 presents concentrations measured at RW1-MW1, with the most recent data collected in the First Quarter 2019. Concentrations of TCE at this location have varied widely since initially sampled in May

2005 (53.6 µg/L). The TCE concentration in March 2019 (110 µg/L) was higher than the concentration reported in May 2005, but less than the highest concentration observed to date (175 µg/L in September 2013). The concentration of cis-1,2-DCE in the First Quarter 2019 (3.9 J µg/L) was below the initial concentration observed in May 2005 (78.6 µg/L) and the second lowest concentration observed to date. Concentrations of PCE have consistently remained below 1.0 µg/L.

Figure 8 presents concentrations measured at RW1-MW3. Concentrations of cis-1,2-DCE and PCE have consistently remained below 1.0 µg/L. Concentrations of TCE have also consistently remained below 5 µg/L with a reported concentration of 4.5 J µg/L during the First Quarter 2019.

Figure 9 presents concentrations measured at RW2-MW1. The concentration of TCE in the March 2019 (9.65 µg/L) was less than the initial concentration observed in May 2005 (37.6 µg/L), and well below the maximum concentration observed in March 2016 (43.9 µg/L). The concentration of cis-1,2-DCE observed in the First Quarter 2019 (2.42 J µg/L) was above the initial concentrations observed in May 2005 (non-detect) but below the maximum concentration observed in the March 2016 (15.3 µg/L). PCE has not been detected during any monitoring events.

Figure 10 presents concentrations measured at RW3-MW1. The concentration of TCE in March 2019 (19.3 µg/L) was below initial concentration observed in January 2010 (35.0 µg/L) and approached the lowest concentration observed at this location to date (19.0 µg/L) observed in March 2018. Concentrations of cis-1,2-DCE have consistently remained below 1.0 µg/L and have not been detected since March 2015. Concentrations of PCE have consistently remained near or below 2.0 µg/L, with a concentration of 1.72 J µg/L in the First Quarter 2019.

Figure 11 presents concentrations measured at RW3-MW2. The TCE concentration observed in March 2019 (118 µg/L) was below initial concentrations observed in January 2010 (160 µg/L), and below the maximum concentration observed in April 2010 (211 µg/L). Concentrations of cis-1,2-DCE at this location have consistently remained below 2.0 µg/L. PCE has only been detected infrequently at this location, with concentrations ranging from 0.28 J µg/L in August 2012 to 0.66 J µg/L in March 2016.

Figure 12 presents concentrations measured at RW3-MW3. The TCE concentration observed in March 2019 (151 µg/L) is below both the initial concentration observed in January 2010 (350 µg/L) and the maximum concentration observed in June 2013 (410 µg/L). Concentrations of cis-1,2-DCE have remained near or below 2.0 µg/L since March 2012. PCE has remained below 1.0 µg/L for all events.

Figure 13 presents concentrations measured at RW3-MW4. TCE concentrations have decreased since the initial monitoring event in January 2010 (21 µg/L), with a concentration of 2.12 J µg/L observed in the First Quarter 2019. PCE has only been detected during two monitoring events: in September 2015 at a concentration of 0.31 J µg/L and March 2016 at a concentration of 0.46 J µg/L. Cis-1,2-DCE has been detected infrequently since the initial monitoring event in January 2010 (0.46 µg/L), in September 2017 (0.21 J µg/L), and during the First Quarter 2019 at concentration of 0.35 J µg/L.

Figure 14 presents concentrations measured at TP-01. The TCE concentration observed in March 2019 (28.3 µg/L) was less than initial concentrations observed in January 2010 (65 µg/L) and below the maximum concentration observed in March 2016 (62 µg/L). Concentrations of cis-1,2-DCE have

generally decreased over time, from an initial value of 190 µg/L in January 2010 to 6.01 µg/L in March 2019. PCE concentrations have remained below 1.0 µg/L since September 2013 and has not been detected since March 2017.

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. Based on the concentrations in the groundwater wells, the GWTP should continue to be operated. The groundwater sampling frequency for the eight monitoring wells has been reduced to semi-annually in accordance with the O&M Manual. Water levels for the 12 monitoring wells will continue to be monitored on a quarterly basis.

5.0 REFERENCES

Tetra Tech, Inc. (Tetra Tech). 2014. *Capture Zone Evaluation and Path Forward, GM-38 Area Groundwater Treatment Plant, Naval Weapons Industrial Reserve Plant, Bethpage, New York*. March.

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
First Quarter 2019

SPDES Parameters	Daily Maximum Goal	Units	January 2019									
			RW-1	RW-3	Combined Influent	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
Process Stream												
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			1/8/19									
Average Flowrate	1100	GPM	657	178.5	836	NR	843	NR	NR	NR	887	NR
Total Flow		gallons	29,332,100	7,967,200	37,299,300	NR	37,628,200	NR	NR	NR	39,585,100	NR
pH	5.5 - 8.5	SU	5.06	5.14	5.08	6.10	6.13	6.15	6.16	6.16	6.16	6.17
Chloroform	5	µg/L	0.330 J	0.300 J	0.324 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1-Dichloroethane	5	µg/L	1.39	1.82	1.48	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichloroethane	0.6	µg/L	0.230 J	ND (1.0)	0.181 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1-Dichloroethene	5	µg/L	0.910 J	1.00	0.93	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
cis 1,2-Dichloroethene	5	µg/L	5.02	1.38	4.24	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
trans 1,2-Dichloroethene	5	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Tetrachloroethene	5	µg/L	16.7	0.390 J	13.22	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1,1-Trichloroethene	5	µg/L	0.660 J	0.600 J	0.647 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Trichloroethene	5	µg/L	73.0	157	90.9	1.03	1.01	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1,2-Trichlorotrifluoroethane	5	µg/L	ND (1.0)	0.880 J	0.19 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	2	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-Dioxane	--	µg/L	NS	NS	NS	NS	NS	NS	NS	NS	3.1	3.1
Mercury	0.00025	mg/L	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Total Suspended Solids (TSS)	NA	mg/L	ND (1.0)	5.8	1.2	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)

Table 1
 GM-38 Area Groundwater Remediation
 Groundwater Treatment Plant
 Naval Weapons Industrial Reserve Plant - Bethpage, NY
 Discharge Monitoring Results
 First Quarter 2019

SPDES Parameters	Daily Maximum Goal	Units	February 2019									
			RW-1	RW-3	Combined Influent	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
Process Stream												
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			2/6/19									
Average Flowrate	1100	GPM	658	174.3	832	NR	839	NR	NR	NR	882	NR
Total Flow		gallons	26,522,500	7,026,600	33,549,100	NR	33,809,900	NR	NR	NR	35,553,500	NR
pH	5.5 - 8.5	SU	5.08	5.14	5.09	6.10	6.12	6.12	6.14	6.14	6.14	6.15
Chloroform	5	µg/L	ND (1.0)	0.29 J	0.06 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1-Dichloroethane	5	µg/L	1.37	1.87	1.47	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichloroethane	0.6	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1-Dichloroethene	5	µg/L	0.790 J	0.990 J	0.83 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
cis 1,2-Dichloroethene	5	µg/L	4.75	1.30	4.03	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
trans 1,2-Dichloroethene	5	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Tetrachloroethene	5	µg/L	16.2	ND (1.0)	12.81	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1,1-Trichloroethene	5	µg/L	0.550 J	0.530 J	0.546 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Trichloroethene	5	µg/L	69.9	151	86.9	1.01	0.820 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1,2-Trichlorotrifluoroethane	5	µg/L	ND (1.0)	0.720 J	0.15 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	2	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-Dioxane	--	µg/L	NS	NS	NS	NS	NS	NS	NS	NS	3.2	3.0
Mercury	0.00025	mg/L	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Total Suspended Solids (TSS)	NA	mg/L	ND (1.0)	3.9	0.8	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)

Table 1
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Results
First Quarter 2019

SPDES Parameters	Daily Maximum Goal	Units	March 2019									
			RW-1	RW-3	Combined Influent	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
Process Stream		ft	445	530	NA	NA	NA	NA	NA	NA	NA	NA
Well Depth		ft	335-395 410-430	392-412 442-504	NA	NA	NA	NA	NA	NA	NA	NA
Screened Interval			3/5/19									
Average Flowrate	1100	GPM	625	163.7	788	NR	787	NR	NR	NR	836	NR
Total Flow		gallons	27,888,822	7,307,145	35,195,966	NR	35,111,084	NR	NR	NR	37,299,439	NR
pH	5.5 - 8.5	SU	5.07	5.17	5.09	6.21	6.24	6.27	6.26	6.27	6.27	6.28
Chloroform	5	µg/L	0.300 J	0.280 J	0.296 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1-Dichloroethane	5	µg/L	1.28 J	1.71 J	1.37 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichloroethane	0.6	µg/L	0.210 J	ND (1.0)	0.17 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1-Dichloroethene	5	µg/L	0.700 J	1.01 J	0.76 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
cis 1,2-Dichloroethene	5	µg/L	4.36 J	1.08 J	3.68 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
trans 1,2-Dichloroethene	5	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Tetrachloroethene	5	µg/L	18.1	0.230 J	14.39	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1,1-Trichloroethene	5	µg/L	0.560 J	0.490 J	0.545 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Trichloroethene	5	µg/L	70.5	154	87.8	1.04 J	0.720 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1,2-Trichlorotrifluoroethane	5	µg/L	ND (1.0)	0.780 J	0.16 J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	2	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-Dioxane	--	µg/L	NS	NS	NS	NS	NS	NS	NS	NS	2.8	3.1
Mercury	0.00025	mg/L	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Total Suspended Solids (TSS)	NA	mg/L	ND (1.0)	2.6	0.5	ND (1.0)	1.4	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)

Notes:

J - Estimated result between laboratory method detection limit and reporting limit

NA - Not Applicable

ND - Not detected above laboratory method detection limit. Limit of detection (LOD) given in parentheses.

NS - Not Sampled

gpm - gallons per minute

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

Table 2
Summary of Radiochemistry Analytical Results
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Results
First Quarter 2019

Sample Location ID	Radium 226 (June 2013)			Radium 228 (June 2013)			Radium 226 (March 2018)			Radium 228 (March 2018)			Radium 226 (March 2019)			Radium 228 (March 2019)		
	Result	(+/-)	MDC	Result	(+/-)	MDC	Result	(+/-)	MDC	Result	(+/-)	MDC	Result	(+/-)	MDC	Result	(+/-)	MDC
Monitoring Wells - Quarterly LTM																		
RW1-MW1	2.43	0.500	0.305	0.0924 U	0.784	1.26	NA			NA			NA			NA		
RW1-MW3	1.07	0.347	0.354	1.79	0.873	1.21	NA			NA			NA			NA		
RW2-MW1	3.99	0.637	0.391	2.81	0.886	0.997	NA			NA			NA			NA		
RW3-MW1	1.11	0.350	0.353	0.957 U	0.813	1.30	NA			NA			NA			NA		
RW3-MW1 - Duplicate	1.02	0.369	0.403	1.35	0.846	1.26	NA			NA			NA			NA		
RW3-MW2	0.772	0.309	0.357	0.539 U	0.683	1.16	NA			NA			NA			NA		
RW3-MW3	1.40	0.449	0.430	1.58	0.784	1.05	NA			NA			NA			NA		
RW3-MW4	2.17	0.483	0.385	2.81	1.31	1.93	NA			NA			NA			NA		
TP1	0.452	0.299	0.429	0.613 U	1.13	1.96	NA			NA			NA			NA		
Equipment/Rinsate Blank	0.101 U	0.222	0.408	1.10 U	1.01	1.66	NA			NA			NA			NA		
Monitoring Wells - Remaining Wells not in Quarterly LTM																		
RW1-MW2	1.74	0.495	0.468	0.733 U	0.741	1.22	NA			NA			NA			NA		
RW2-MW2	0.829	0.359	0.432	0.296 U	0.774	1.39	NA			NA			NA			NA		
RW2-MW3	3.49	0.606	0.255	1.74	0.819	1.08	NA			NA			NA			NA		
IW1-MW1	0.769	0.349	0.429	0.635 U	0.913	1.57	NA			NA			NA			NA		
Recovery Wells																		
RW1	1.13	0.355	0.347	1.38	0.804	1.16	2.05	0.59	0.444	2.38	1.17	1.63	2.07	0.62	0.599	1.44 U	1.03	1.65
RW3	1.22	0.409	0.428	0.488 U	0.753	1.31	NA			NA			1.46	0.56	0.62	2.08	1.13	1.74
GWTP Process Samples																		
GWTP Treated Effluent	0.948	0.317	0.285	1.40 U	0.965	1.49	0.735	0.44	0.588	0.347 U	1.00	1.80	0.84	0.47	0.575	0.0796 U	0.88	1.61
GWTP Treated Effluent - Duplicate	1.16	0.383	0.397	2.00 U	1.30	2.06	1.95	0.59	0.406	1.44 U	1.03	1.62	1.90	0.68	0.632	1.63	0.81	1.15

Notes:

GWTP = groundwater treatment plant

LTM = long-term monitoring

MDC = minimum detectable concentration

ug/L = micrograms per liter

All value reported as pCi/L = picoCurie per liter

U = Analyte not detected above associated MDC, MDL, MDA, or LOD.

NA = Not Analyzed

Radium 226 analyzed by EPA 903.1 Modified with a RL of 1.00 pCi/L.

Radium 228 analyzed by EPA 904.0/SW846 9320 Modified with a RL of 3.00 pCi/L.

Bold highlight indicates detected compound.

Uncertainty is calculated at the 95% confidence interval.

Table 3
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Air Sampling Results
First Quarter 2019

DAR Parameters	Discharge Goal ⁽³⁾	Units	January 2019				
			Influent (VCI1)	VC12	VC23	Effluent	Effluent Duplicate
Process Stream							
Sampling Date			1/8/19				
Average Flowrate		CFM	NR	NR	NR	9,420	NR
Total Flow ⁽¹⁾		ft ³	NR	NR	NR	416,542,836	NR
Total Flow ⁽²⁾		m ³	NR	NR	NR	11,795,180	NR
1,2-Dichloroethane	NA	µg/m ³	2.5 J	4.5	ND	ND	ND
cis 1,2-Dichloroethene	≤ 100,000 ⁽⁴⁾	µg/m ³	39	50	56	46	45
trans 1,2-Dichloroethene		µg/m ³	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	≤ 100,000	µg/m ³	39	50	56	48	45
Toluene	NA	µg/m ³	0.52 J	ND	ND	0.86 J	ND
Xylene	NA	µg/m ³	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	NA	µg/m ³	1.7 J	ND	ND	ND	ND
Trichloroethene	≤ 2600	µg/m ³	1400	610	ND	6.6	ND
Vinyl Chloride	≤ 560	µg/m ³	ND	ND	ND	ND	ND
Tetrachloroethene	≤ 5100	µg/m ³	180	7.9	ND	ND	ND

Notes:

NA - Not applicable

ND - Not detected

NR - Not recorded

SGC - Short-term Guideline Concentration

µg/m³ - micrograms per cubic meter

CFM - cubic feet per minute

DAR - Division of Air Resources

(1) Total Flow (ft³) = avg flowrate (cfm) * operational time (min)

(2) Total Flow (m³) = total flow (ft³) * (0.3048³)m³/ft³

(3) Discharge goal as concurred by NYSDEC's letter dated 10/31/2013.

(4) Discharge goal is for total 1,2-Dichloroethene.

Table 3
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Air Sampling Results
First Quarter 2019

DAR Parameters	Discharge Goal ⁽³⁾	Units	February 2019				
			Influent (VC11)	VC12	VC23	Effluent	Effluent Duplicate
Process Stream							
Sampling Date			2/19/19				
Average Flowrate		CFM	NR	NR	NR	9,526	NR
Total Flow ⁽¹⁾		ft ³	NR	NR	NR	384,076,800	NR
Total Flow ⁽²⁾		m ³	NR	NR	NR	10,875,844	NR
1,2-Dichloroethane	NA	µg/m ³	2.0 J	2.8 J	ND	ND	ND
cis 1,2-Dichloroethene	≤ 100,000 ⁽⁴⁾	µg/m ³	47	53	70	58	54
trans 1,2-Dichloroethene		µg/m ³	0.93 J	1.5 J	1.6 J	1.1 J	ND
1,2-Dichloroethene (total)	≤ 100,000	µg/m ³	48	54	72	59	54
Toluene	NA	µg/m ³	3.5	ND	ND	ND	0.86 J
Xylene	NA	µg/m ³	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	NA	µg/m ³	2.0 J	ND	ND	ND	ND
Trichloroethene	≤ 2600	µg/m ³	1100	780	ND	ND	3.2 J
Vinyl Chloride	≤ 560	µg/m ³	1.2 J	0.87 J	0.97 J	ND	ND
Tetrachloroethene	≤ 5100	µg/m ³	160	5	ND	ND	ND

Notes:

NA - Not applicable

ND - Not detected

NR - Not recorded

SGC - Short-term Guideline Concentration

µg/m³ - micrograms per cubic meter

CFM - cubic feet per minute

DAR - Division of Air Resources

(1) Total Flow (ft³) = avg flowrate (cfm) * operational time (min)

(2) Total Flow (m³) = total flow (ft³) * (0.3048³)m³/ft³

(3) Discharge goal as concurred by NYSDEC's letter dated 10/31/2013.

(4) Discharge goal is for total 1,2-Dichloroethene.

Table 3
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Air Sampling Results
First Quarter 2019

DAR Parameters	Discharge Goal ⁽³⁾	Units	March 2019				
			Influent (VCI1)	VC12	VC23	Effluent	Effluent Duplicate
Process Stream							
Sampling Date			3/5/19				
Average Flowrate		CFM	NR	NR	NR	9,460	NR
Total Flow ⁽¹⁾		ft ³	NR	NR	NR	422,304,464	NR
Total Flow ⁽²⁾		m ³	NR	NR	NR	11,958,331	NR
1,2-Dichloroethane	NA	µg/m ³	1.9 J	2.9 J	ND	ND	ND
cis 1,2-Dichloroethene	≤ 100,000 ⁽⁴⁾	µg/m ³	44	52	69	55	62
trans 1,2-Dichloroethene		µg/m ³	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	≤ 100,000	µg/m ³	44	52	69	55	62
Toluene	NA	µg/m ³	0.49 J	ND	ND	ND	0.70 J
Xylene	NA	µg/m ³	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	NA	µg/m ³	ND	ND	ND	ND	ND
Trichloroethene	≤ 2600	µg/m ³	1100	840	0.84 J	1.1 J	20
Vinyl Chloride	≤ 560	µg/m ³	0.74 J	0.92 J	0.87 J	0.66 J	1.0 J
Tetrachloroethene	≤ 5100	µg/m ³	160	6.2	ND	ND	34.00

Notes:

NA - Not applicable

ND - Not detected

NR - Not recorded

SGC - Short-term Guideline Concentration

µg/m³ - micrograms per cubic meter

CFM - cubic feet per minute

DAR - Division of Air Resources

(1) Total Flow (ft³) = avg flowrate (cfm) * operational time (min)

(2) Total Flow (m³) = total flow (ft³) * (0.3048³)m³/ft³

(3) Discharge goal as concurred by NYSDEC's letter dated 10/31/2013.

(4) Discharge goal is for total 1,2-Dichloroethene.

Table 4
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Stack Emissions
First Quarter 2019

DAR Parameters	Discharge Goal ⁽¹⁾	Units	January 2019	February 2019	March 2019
Sampling Date			1/8/19	2/19/19	3/5/19
Average Flowrate		CFM	9,420	9,526	9,460
Total Flow		ft ³	416,542,836	384,076,800	422,304,464
Total Flow		m ³	11,795,180	10,875,844	11,958,331
Trichloroethene	0.09	lb/hr	0.00023	0.00000	0.00004
Vinyl Chloride	0.02	lb/hr	0.00000	0.00000	0.00002
1,2 Dichloroethene	11	lb/hr	0.00168	0.00211	0.00195
1,2-Dichloroethane	NA	lb/hr	0.00000	0.00000	0.00000
Toluene	NA	lb/hr	0.00003	0.00000	0.00000
Total Xylene	NA	lb/hr	0.00000	0.00000	0.00000
1,1,2-Trichloroethane	NA	lb/hr	0.00000	0.00000	0.00000
Tetrachloroethene	0.18	lb/hr	0.00000	0.00000	0.00000

Notes:

NA - Not applicable

lb/hr - pounds per hour

DAR - Division of Air Resources

CFM - Cubic feet per minute

Stack Emissions (lb/hr) = average flowrate (cfm) * (0.3048^{^3})m³/ft³ * conc.(ug/m³) * 1 lb/453592370 ug * 60 min/hr

(1) Discharge goal as concurred by NYSDEC's letter dated 31 October 2013.

Table 5
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Level Measurements
First Quarter 2019

Monitoring Well ID	Date	Well Elevation (ft amsl)	Total Depth (ft)	Screen Interval (ft)	Depth to Water (ft)	Groundwater Elevation (ft amsl)
RW1-MW1	03/05/19	85.86	435	395-435	33.60	52.26
RW1-MW2	03/05/19	87.35	435	395-435	36.18	51.17
RW1-MW3	03/05/19	80.34	435	395-435	26.68	53.66
RW2-MW1	03/05/19	90.75	510	470-510	37.00	53.75
RW2-MW2	03/05/19	90.15	510	470-510	35.17	54.98
RW2-MW3	03/05/19	89.75	510	470-510	36.10	53.65
RW3-MW1	03/05/19	92.22	350	330-350	35.50	56.72
RW3-MW2	03/05/19	91.98	495	475-495	37.02	54.96
RW3-MW3	03/05/19	92.98	340	320-340	36.80	56.18
RW3-MW4	03/05/19	92.92	495	475-495	38.10	54.82
TP-01	03/05/19	85.91	470	450-470	31.64	54.27
IW1-MW1	03/05/19	89.41	150	20-150	39.74	49.67
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 6
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
First Quarter 2019

Location	Temp (°C)	pH (SU)	S.C. (uS/cm ³)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Color (Visual)
RW1-MW1	14.27	4.41	141	0.66	272.10	0.89	Clear
RW1-MW3	13.41	4.58	163	1.36	225.60	8.31	Clear
RW2-MW1	13.21	5.82	179	0.25	39.80	5.24	Clear
RW3-MW1	13.36	4.59	138	7.83	268.80	21.90	Clear
RW3-MW2	12.30	4.65	76	1.32	247.90	1.18	Clear
RW3-MW3	13.67	4.79	103	1.46	231.10	6.72	Clear, iron deposits
RW3-MW4	12.44	4.47	142	0.68	257.60	1.56	Clear
TP-01	12.60	6.00	199	7.12	195.40	1.49	Clear

Notes:

S.C. = Specific Conductance

mS/cm = milliSiemens per centimeter

NTU = nephelometric turbidity units

mg/L = milligrams per liter

°C = degrees celsius

mV = millivolts

SU = standard units

ORP = oxidation/reduction potential

Table 7
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Detected Groundwater Analytical Results
First Quarter 2019

Sample ID	RW1-MW1	RW1-MW3	RW2-MW1	RW3-MW1	RW3-MW2	RW3-MW3	RW3-MW3	RW3-MW4	TP-01	RW-1	RW-3
Sample Date	3/7/2019	3/7/2019	3/7/2019	3/5/2019	3/5/2019	3/5/2019	3/5/3019	3/5/2019	3/6/2019	3/5/2019	3/5/2019
Comments							Duplicate				
VOCS (EPA 624) ug/L ⁽¹⁾											
Chloroform	0.573 J	0.725 J	2.03 J	ND	ND	0.420 J	0.370 J	0.996 J	0.684 J	0.300 J	0.280 J
1,1-dichloroethane	7.89	4.14 J	7.81	ND	0.364 J	2.21 J	1.97 J	6.22	0.717 J	1.28 J	1.71 J
1,2-dichloroethane	ND	ND	0.552 J	ND	ND	ND	ND	0.235 J	ND	0.210 J	ND
1,1-dichloroethene	2.19 J	1.08 J	1.67 J	ND	0.256 J	1.17 J	1.14 J	0.981 J	ND	0.700 J	1.01 J
1,4-Dioxane	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
cis-1,2-dichloroethene	3.86 J	0.398 J	2.42 J	ND	1.10 J	0.840 J	0.805 J	0.351 J	6.01	4.36 J	1.08 J
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	18.1	0.230 J
1,1,1-trichloroethane	1.16 J	1.27 J	0.761 J	ND	ND	0.594 J	0.599 J	0.481 J	ND	0.560 J	0.490 J
1,1,2-trichloroethane	ND	0.296 J	ND	ND	0.240 J	ND	ND	ND	ND	ND	0.780 J
Trichloroethene	110	4.49 J	9.65	19.3	118	151	147	2.12 J	28.3	70.5	154
Mercury (EPA 245.1) ug/L	ND	ND	ND	ND	ND	0.088 J	0.122 J	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	ND	8.6	24.2	16.4	ND	5.1 J	1.6 J	1.3	1.1	ND	2.6

Notes:

J = estimated value

ND = Not detected above laboratory method detection limit

mg/L = milligrams per liter

µg/L = micrograms per liter

NS = Not Sampled

(1) Samples were analyzed for TCL VOCs (including tentatively identified compounds [TICs]). Only those VOCs detected are presented above.

Table 8
 GM-38 Area Groundwater Remediation
 Groundwater Treatment Plant
 Naval Weapons Industrial Reserve Plant - Bethpage, NY
 Summary of Historical Groundwater Analytical Results
 Through First Quarter 2018

Sample ID	RW1-MW3																												
Sample Date	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 ⁽¹⁾	9/17/2013	12/17/2013	3/25/2014	9/23/2014	3/25/2015	9/14/2015	3/21/2016	9/14/2016	3/1/2017	9/13/2017	3/5/2018	9/12/2018	3/7/2019		
Comments																													
Well Depth (Ft)	435																												
Screened Interval (Ft)	395-435																												
VOCS (EPA 624) ug/L ⁽¹⁾																													
Acrolein	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	30 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	
Acrylonitrile	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Benzene	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromodichloromethane	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromoform	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromomethane	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-butanone	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
carbon disulfide	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Carbon tetrachloride	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.41 J	ND	ND	ND	ND	ND	ND		
Chlorobenzene	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dibromochloromethane	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroethane	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR	
Chloroform	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	ND	ND	0.74 J	0.67 J	0.79 J	ND	0.79 J	0.80 J	0.61 J	0.69 J	0.67 J	0.720 J	0.725 J		
Chloromethane	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.29 J	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	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	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
1,2-dichlorobenzene	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,3-dichlorobenzene	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,4-dichlorobenzene	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
1,1-dichloroethane	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	9.7 J	8.1	8.6	6.1 J	8.1	7.7	7.4	7.0	4.5	4.4	4.1	3.47	4.14 J		
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.18 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-dichloroethene	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	1.6	1.9	2.1	1.6 J	2.3 J	2.3	2.5	1.7	1.1	1.2	0.97 J	0.950 J	1.08 J		
cis-1,2-dichloroethene	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	0.72 J	0.60 J	0.57 J	0.44 J	0.54 J	0.49 J	0.58 J	0.44 J	0.29 J	0.37 J	0.36 J	0.310 J	0.398 J		
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	ND	ND	ND	ND	ND	ND	ND	
1,2-dichloropropane	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
cis-1,3-dichloropropene	NR	ND	ND	ND	ND	NR	ND	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	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Ethylbenzene	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	
2-hexanone	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Methylene chloride	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
4-methyl-2-pentanone	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
methyl-tert-butyl-ether	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
styrene	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
1,1,2,2-tetrachloroethane	NR	ND	ND	ND	ND	NR	ND	ND	ND	0.23 J	ND	ND	ND	0.20 J	ND	ND	ND	ND	ND	ND	ND	0.25 J	ND	ND	ND	ND	ND	ND	
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Tetrachloroethene	ND	0.49J	ND	ND	ND	0.33 J	0.62 J	ND	0.65 J	0.30 J	0.97 J	0.40 J	ND	ND	ND	ND	ND	ND	ND	0.50 J	ND	0.35 J	ND	0.22 J	0.23 J	0.290 J	ND		
Toluene	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1,1-trichloroethane	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	1.5	2.0	1.7	1.2 J	1.5	1.6	2.1	1.6	1	1.1	0.87 J	0.810 J	1.27 J		
1,1,2-trichloroethane	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	ND	0.55 J	0.46 J	0.46 J	0.43 J	0.44 J	0.47 J	0.41 J	0.51 J	0.35 J	0.37 J	0.400 J	0.296 J		
Trichloroethene	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	2.5	3.2	2.5	1.9	2.0	2.4	4.5	3.5	2.3	2.8	2.2	2.24	4.49 J		
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Trichlorofluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
TSS (SM20 2540D) mg/L	NR	8.0	<4.0	<4.0	<4.0	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	ND	1.8	2.1	5.6	7.1	2.7	8.6		

Table B
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through First Quarter 2018

Sample ID	RW3-MW2																																			
	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⁾	9/17/2013	12/17/2013	3/25/2014	9/23/2014	9/23/2014	3/25/2015	9/14/2015	3/22/2016	9/14/2016	9/14/2016	3/2/2017	3/2/2017	9/12/2017	3/6/2018	9/11/2018	3/5/2019		
Comments		Duplicate			Duplicate									Duplicate		Duplicate							Duplicate						Duplicate		Duplicate					
Well Depth (Ft)	495																																			
Screened Interval (Ft)	475-495																																			
VOCS (EPA 624) ug/L ⁽⁴⁾																																				
Acrolein	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	30 R	30 R	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR		
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Acetone	NR	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
Benzene	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromodichloromethane	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromoform	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromomethane	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-butanone	NR	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
carbon disulfide	NR	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dibromochloromethane	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroethane	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-chlorodichlorovinyl ether	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Chloroform	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	0.23 J	ND	ND	0.62 J	0.64 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27 J	0.24 J	0.23 J	0.26 J	0.24 J	0.24 J	0.23 J	ND	ND		
Chloromethane	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	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	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	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	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,3-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,4-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
1,1-dichloroethane	ND	ND	0.54J	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	0.65 J	0.59 J	0.62 J	0.51 J	0.51 J	0.56 J	0.47 J	0.52 J	0.39 J	0.34 J	0.39 J	0.47 J	0.36 J	0.29 J	0.290 J	0.364 J			
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-dichloroethene	ND	ND	1.2	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	0.29 J	0.45 J	0.44 J	0.38 J	0.33 J	0.33 J	0.30 J	0.46 J	0.31 J	0.37 J	0.25 J	ND	0.26 J	ND	ND	0.256 J			
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	ND	1.3 J	1.9	1.7	1.4	1.3	1.5	1.4	1.7	1.5	1.5	1.5	1.5	1.3	1.3	1.2	0.990 J	1.10 J		
trans-1,2-dichloroethene	ND	ND	0.43 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	ND	ND	ND	ND	ND	ND	ND	ND	0.69 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
cis-1,3-dichloropropene	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	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	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	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	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	ND	ND	ND	ND	
2-hexanone	NR	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
4-methyl-2-pentanone	NR	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
methyl-tert-butyl-ether	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
styrene	NR	NR	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
1,1,2,2-tetrachloroethane	NR	NR	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.29 J	ND	ND	ND	0.52 J	0.66 J	0.48 J	0.54 J	0.44 J	0.38 J	0.43 J	0.38 J	0.430 J	0.328 J		
Toluene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1,1-trichloroethane	ND	ND	0.58J	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	0.47 J	0.50 J	0.43 J	0.36 J	0.39 J	0.38 J	0.41 J	0.47 J	0.44 J	0.47 J	0.41 J	0.34 J	0.26 J	0.33 J	ND	ND			
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	ND	ND	ND	ND	ND	ND	0.32 J	0.31 J	0.21 J	0.32 J	0.24 J	0.26 J	ND	ND	0.240 J			
Trichloroethene	160	170	211	73	58.2	60.9	110	135	151	71.9	96.5	209	198	192	173 J	171	155	140	174	176	1															

Table 8
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through First Quarter 2018

Sample ID	RW3-MW3																																				
	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⁾	9/18/2013	12/17/2013	3/26/2014	9/23/2014	3/25/2015	3/25/2015	9/15/2015	3/21/2016	9/15/2016	3/2/2017	9/12/2017	9/12/2017	3/6/2018	3/6/2018	9/12/2018	9/12/2018	3/5/2019	3/5/2019			
Comments			Duplicate								Duplicate											Duplicate						Duplicate		Duplicate		Duplicate		Duplicate		Duplicate	
Well Depth (Ft)	340																																				
Screened Interval (Ft)	320-340																																				
VOCS (EPA 624) ug/L ⁽⁴⁾																																					
Acrolein	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	150 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR		
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Acetone	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
Benzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-butanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
carbon disulfide	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chlorodichlorovinyl ether	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	
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	ND	3.4 J	ND	0.27 J	0.40 J	0.33 J	ND	ND	0.48 J	0.45 J	0.35 J	0.27 J	0.33 J	0.37 J	0.400 J	0.400 J	0.420 J	0.420 J	0.370 J		
Chloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	NR	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	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	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
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	ND	3.7 J	4.9 J	1.3 J	1.8	1.8	1.2	4.0	3.5	2.9	2.5	2.2	2.0	2.3	2.08	2.24	2.21 J	1.97 J			
1,2-dichloroethane	ND	0.52J	0.54J	ND	ND	ND	0.37 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.30 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	2.4 J	0.94 J	1.5 J	1.4 J	1.1	2.4	2.0	1.3	ND	0.78 J	1.1	1.2	1.00	1.14	1.17 J	1.14 J				
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	ND	ND	1.2	1.3	1.3	1.3	1.1	1.1	0.83 J	0.8 J	0.76 J	0.63 J	0.59 J	0.590 J	0.640 J	0.840 J	0.805 J				
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	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	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	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	3.2 J	ND	6.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
4-methyl-2-pentanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
methyl-tert-butyl-ether	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
styrene	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
1,1,2,2-tetrachloroethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Tetrachloroethene	ND	0.45J	0.49J	ND	ND	0.40 J	0.50 J	ND	0.72 J	0.69 J	ND	ND	0.43 J	ND	ND	ND	ND	ND	0.36 J	0.37 J	0.77 J	0.71 J	0.58 J	0.43 J	0.31 J	0.44 J	0.36 J	0.32 J	0.390 J	0.390 J	0.538 BJ	0.592 BJ					
Toluene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
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	ND	0.40 J	0.48 J	0.45 J	0.36 J	1.1	0.75 J	0.69 J	0.46 J	0.38 J	0.61 J	0.57 J	0.550 J	0.530 J	0.5						

Table 8
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through First Quarter 2018

Sample ID	RW3-MW4																												
	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⁾	9/17/2013	12/17/2013	3/26/2014	9/23/2014	3/25/2015	9/15/2015	3/21/2016	9/15/2016	3/2/2017	9/12/2017	3/6/2018	9/12/2018	3/5/2019	
Comments	Duplicate																												
Well Depth (Ft)	495																												
Screened Interval (Ft)	475-495																												
VOCS (EPA 624) ug/L ⁽⁴⁾																													
Acrolein	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	30 R	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Acetone	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Benzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Bromodichloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Bromoform	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Bromomethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
2-butanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
carbon disulfide	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Chlorobenzene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Dibromochloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Chloroethane	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	NR
Chloroform	ND	ND	ND	ND	0.32 J	ND	NR	0.87 J	ND	0.38 J	ND	ND	0.71 J	ND	1.2	ND	ND	1.2 J	0.38 J	1.2	ND	0.64 J	ND	ND	0.21 J	0.47 J	ND	0.996 J	
Chloromethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
cyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	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	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,3-dichlorobenzene	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
dichlorodifluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1-dichloroethane	2.5	0.6	0.54 J	0.50 J	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	2.9	4.9	5.5	2.7 J	6.9	0.88 J	4.9	2.0	1.5	2.6	3.9	1.47	6.22	
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.235 J
1,1-dichloroethene	1.0	ND	ND	ND	0.86 J	ND	0.20 J	0.53 J	ND	0.21 J	ND	ND	0.19 J	0.38 J	0.42 J	ND	0.39 J	0.95 J	0.37 J	1.3 J	0.21 J	0.85 J	0.40 J	0.27 J	0.41 J	0.70 J	0.340 J	0.981 J	
cis-1,2-dichloroethene	0.46 J	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.21 J	ND	0.351 J	
trans-1,2-dichloroethene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
cis-1,3-dichloropropene	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
trans-1,3-dichloropropene	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	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	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	NR
2-hexanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	ND	ND	ND	ND	ND	ND	ND	ND	0.43 J	ND	ND	ND	ND	ND	
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4-methyl-2-pentanone	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methyl-tert-butyl-ether	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
styrene	NR	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2,2-tetrachloroethane	NR	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tetrachloroethene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.31 J	0.46 J	ND	ND	ND	ND	ND	NR
Toluene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,1,1-trichloroethane	ND	ND	ND	ND	0.67 J	ND	ND	0.66 J	ND	ND	ND	ND	ND	ND	0.29 J	ND	0.39 J	0.48 J	ND	0.60 J	ND	0.48 J	0.24 J	ND	0.26 J	0.40 J	ND	0.481 J	
1,1,2-trichloroethane	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
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	5.0	4.4	3.3	2.5	2.7	4.1	2.9	4.3	4.1	5.4	1.5	2.66	2.12 J	
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Trichlorofluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vinyl chloride	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
xylene (total)	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
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	ND	ND	9	5	5	ND	ND	1.4	ND	1.3	ND	ND	1.3	

Table 8
 GM-38 Area Groundwater Remediation
 Groundwater Treatment Plant
 Naval Weapons Industrial Reserve Plant - Bethpage, NY
 Summary of Historical Groundwater Analytical Results
 Through First Quarter 2018

Sample ID	TP-01																										
	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⁾	9/17/2013	9/17/2013	12/16/2013	3/25/2014	9/22/2014	3/25/2015	9/14/2015	9/14/2015	3/21/2016	9/14/2016	3/1/2017	9/13/2017	3/5/2018	9/11/2018	3/6/2019
Comments				Duplicate							Duplicate			Duplicate						Duplicate							
Well Depth (Ft)	470																										
Screened Interval (Ft)	450-470																										
VOCS (EPA 624) ug/L ⁽⁶⁾																											
Acrolein	NR	NR	ND	ND	ND	ND	ND	30 R	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Acrylonitrile	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Acetone	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR
Benzene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Bromodichloromethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.53 J	ND	ND	ND
Bromoform	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Bromomethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
2-butanone	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
carbon disulfide	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Chlorobenzene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Dibromochloromethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Chloroethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
2-chloroethylvinyl ether	NR	NR	ND	ND	ND	ND	ND	ND	ND	2.0 R	2.0 R	NR	ND	ND	ND	ND	ND	ND	2.0 R	ND	ND	ND	NR	ND	ND	ND	NR
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	5.2 J	ND	7.4	6.8 J	1.9	2.6	1.3	1.3	1.7	1.6	1.2	6.3	2.0	1.08	0.684 J
Chloromethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
cyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	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	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,3-dichlorobenzene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,4-dichlorobenzene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
dichlorodifluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
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	2.1J	2.8	1.5	ND	1.3 J	2.5	2.1	2.0	1.8	2.1	0.78 J	1.3	1.2	1.24	0.717 J
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	0.35 J	0.36 J	0.37 J	0.30 J	ND	ND	ND	ND	0.67 J	0.88 J	0.82 J	0.82 J	0.86 J	0.70 J	0.45 J	0.79	0.79 J	0.650 J	ND	
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	0.66 J	0.74 J	0.33 J	0.22 J	0.47 J	1.2 J	0.77 J	0.83 J	0.75 J	0.68 J	0.23 J	0.36 J	0.46 J	0.420 J	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	14.1 J	14.7	8.0	5.3	7.6	13.4	11.3	11.6	10.8	12	5	11	12	12.1	6.01
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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloropropane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
cis-1,3-dichloropropene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
trans-1,3-dichloropropene	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ethylbenzene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	NR
2-hexanone	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
isopropylbenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methyl acetate	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37 J	ND	ND	ND	ND	ND	ND	
methylcyclohexane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4-methyl-2-pentanone	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
methyl-tert-butyl-ether	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
styrene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,1,2,2-tetrachloroethane	NR	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
1,2,4-trichlorobenzene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
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	0.77 J	1.5 J	0.57 J	ND	ND	0.48 J	0.82 J	0.88 J	0.72 J	0.37 J	0.22 J	ND	ND	ND	
Toluene	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
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	0.66 J	0.66 J	0.50 J	ND	ND	ND	ND	ND	0.49 J	0.25 J	0.29 J	0.27 J	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
Trichloroethene	65	35.3	41.0	39.6	38.0	38.1	40.4	27.9	22.0	25.9	25.4	25	27.0	26.7	29.8	21.7	31.9	52.3	53.0	53.9	61.7	47	21	54	55	38.2	28.3
m,p-xylene	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Trichlorofluoromethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Trichlorotrifluoroethane	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	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	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
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	NR	NR	NR	NR	NR	NR	NR	NR	NR
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
xylenes (total)	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mercury (EPA 245.1) ug/L	NR	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR
TSS (SM20 2540D) mg/L	NR	63	18	NR	ND	7	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1

Table 8
GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Summary of Historical Groundwater Analytical Results
Through First Quarter 2018

Sample ID	RW1-MW2				RW2-MW2			RW2-MW3				IW-1 MW-1		IW-1	RW-3 ⁽³⁾					
	5/4/2005	7/22/2005	5/28/2009	6/18/2013 ⁽²⁾	5/4/2005	7/21/2005	6/17/2013 ⁽²⁾	5/3/2005	7/20/2005	5/28/2009	6/18/2013 ⁽²⁾	5/3/2005	6/18/2013 ⁽²⁾	5/27/2009	9/15/2015	3/22/2016	9/15/2016	3/2/2017	9/13/2017	3/5/2018
Comments																				
Well Depth (Ft)	435				510			510				150		230	530					
Screened Interval (Ft)	395-435				470-510			470-510				20-150		200-230	392-412 442-504					
VOCS (EPA 624) ug/L ⁽⁴⁾																				
Acrolein	NR	NR	NR	NR	NR	NR	NR	NR	NR	30 R	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND
Acrylonitrile	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-butanone	R	R	ND	ND	R	R	ND	R	R	ND	ND	R	ND	ND	NR	NR	NR	NR	NR	NR
carbon disulfide	ND	ND	ND	NR	ND	ND	NR	ND	ND	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR	NR
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	NR	NR	ND	ND	NR	NR	ND	NR	NR	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-chloroethylvinyl ether	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	ND	ND	ND	ND	ND	ND
Chloroform	ND	1.4	ND	ND	ND	ND	0.55	ND	ND	ND	ND	0.94J	ND	0.98J	ND	0.46 J	0.26 J	ND	0.28 J	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR
cyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR
1,2-dibromo-3-chloro-propane	ND	ND	ND	NR	ND	ND	NR	ND	ND	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR	NR
1,2-dibromomethane	ND	ND	ND	NR	ND	ND	NR	ND	ND	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR	NR
1,2-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	ND	ND	ND	ND	ND	ND
dichlorodifluoromethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR
1,1-dichloroethane	4.6	5.5	3.4	3.9	ND	0.78J	4.9	0.68J	0.31J	1.4	7.4	0.39J	0.51	0.22J	1.9	2.1	1.8	1.4 J	1.5	1.3
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	0.32 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-dichloroethene	3.2	12.3	ND	ND	ND	0.41J	0.72	ND	ND	0.42J	ND	ND	ND	ND	1.9	2.5	1.5	1.3 J	1.4	0.84 J
cis-1,2-dichloroethene	181.0	47.6	160.0	120	0.33J	0.41J	4.6	0.40J	0.66J	2.3	ND	ND	ND	ND	1.6	2.4	1.4	1.6 J	1.9	3.4
trans-1,2-dichloroethene	2.5	7.6	2.5	1.9 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.23 J	ND	ND	ND	ND
1,2-dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-dichloropropene	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dioxane	4.01	NR	NR	NR	7.45J	NR	NR	7.42J	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	4.7
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR
2-hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR
isopropylbenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR
methyl acetate	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR
Methylene chloride	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.64 J	ND	ND	ND	ND	ND
methylcyclohexane	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR
4-methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	NR	NR	NR	NR	NR
methyl-tert-butyl-ether	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	0.46J	NR	NR	NR	NR	NR	NR
styrene	ND	ND	ND	NR	ND	ND	NR	ND	ND	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR	NR
1,1,2,2-tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-trichlorobenzene	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR
Tetrachloroethene	ND	134.0	19.0	5.9	ND	ND	ND	ND	ND	ND	ND	ND	0.55	ND	0.68 J	0.79 J	0.64 J	0.60 J	0.65 J	0.59 J
Toluene	0.32J	ND	ND	ND	0.33J	0.53J	ND	ND	0.50J	0.39J	ND	ND	ND	0.19J	ND	ND	ND	ND	ND	ND
1,1,1-trichloroethane	1.3	1.0	ND	ND	ND	ND	0.34 J	ND	ND	ND	ND	0.47	0.92	0.49J	0.96 J	1.3	0.95 J	ND	0.83 J	ND
1,1,2-trichloroethane	ND	0.65J	ND	ND	D	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.30 J	0.49 J	0.29 J	ND	0.45 J	0.22 J
Trichloroethene	158.0	198.0	200.0	64	7.8	13.8	12	16.2	20.6	18.0	60	ND	ND	0.17J	237	371	230	230	220	120
m,p-xylene	NR	NR	NR	ND	NR	NR	ND	NR	NR	NR	ND	NR	ND	ND	NR	NR	NR	NR	NR	NR
Trichlorofluoromethane	NR	NR	NR	ND	NR	NR	ND	NR	NR	NR	ND	NR	ND	ND	NR	NR	NR	NR	NR	NR
Trichlorotrifluoroethane	NR	NR	NR	ND	NR	NR	ND	NR	NR	NR	ND	NR	ND	ND	NR	NR	NR	NR	NR	NR
o-xylene	NR	NR	NR	ND	NR	NR	ND	NR	NR	NR	ND	NR	ND	ND	NR	NR	NR	NR	NR	NR
1,1,2-trichloro-1,2,2-trifluoroethane	NR	NR	ND	NR	NR	NR	NR	NR	NR	ND	NR	NR	NR	ND	NR	NR	NR	NR	NR	NR
Vinyl chloride	12.9	187.0	4.1	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	NR	ND	ND	ND	NR	ND	NR	ND	NR	NR	NR	NR	NR	NR
Mercury (EPA 245.1) ug/L	NR	NR	0.20	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.20	ND	ND	ND	ND	ND	ND
TSS (SM20 2540D) mg/L	NR	NR	4.0	NR	NR	NR	NR	NR	NR	14.8	NR	NR	NR	2.4	ND	ND	ND	2.4	8.1	14.0

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 vice versa.

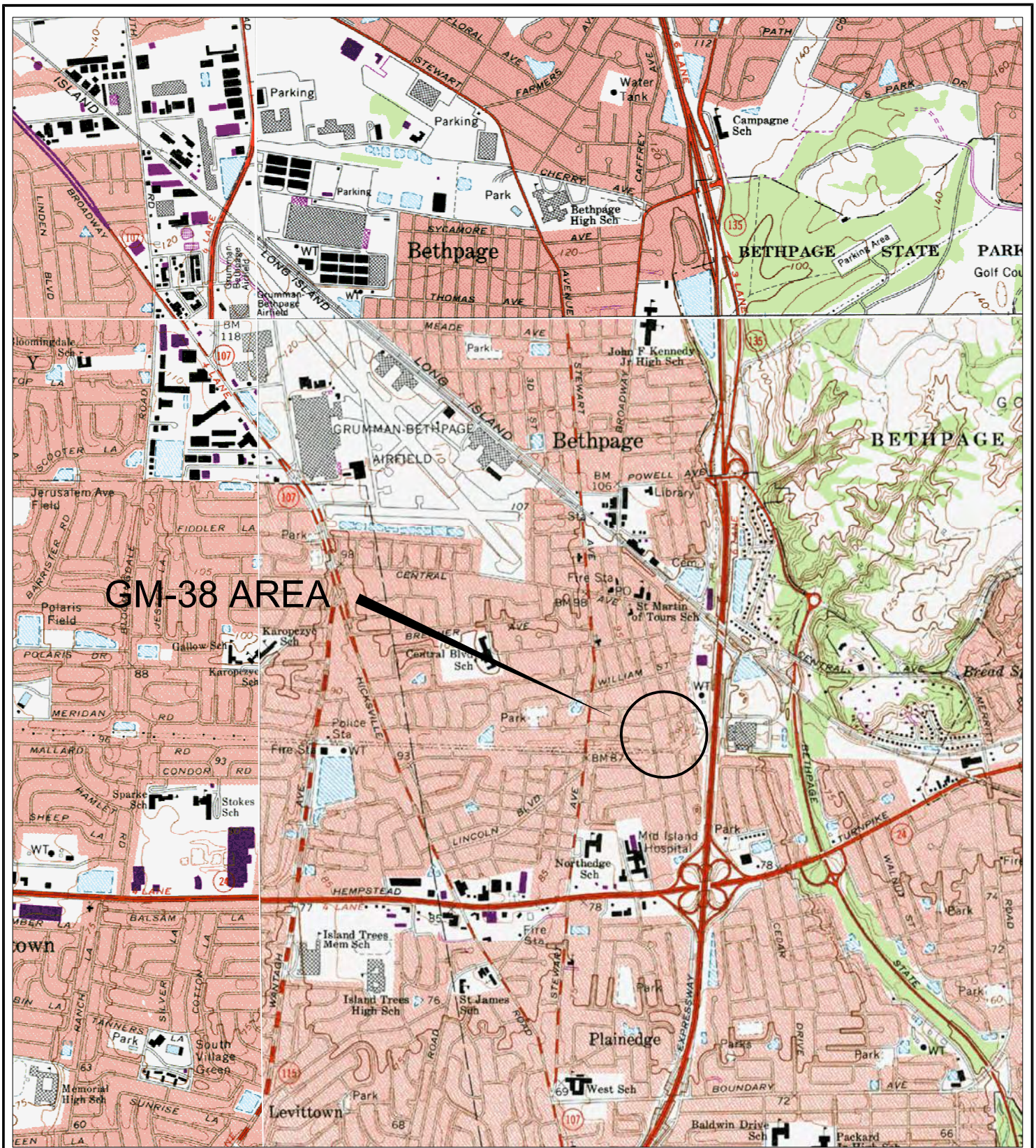
(2) VOCs were analyzed by USEPA Method 524.2 (as opposed to Method 624) in June 2013 to correlate with samples collected under the Bethpage Regional Plume Comprehensive Groundwater Sampling Plan conducted in June 2013.

(3) RW-3, previously an active extraction well sampled on a monthly basis, was taken off-line on 7/1/15. RW-3 is now sampled semi-annually, in conjunction with the semi-annual LTM events.

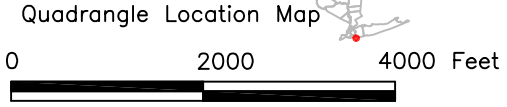
(4) Samples were analyzed for TCL VOCs, including tentatively identified compounds (TICs), beginning in March 2016. No TICs were detected, unless otherwise indicated.

Data prior to June 2011 were collected by others.

FIGURES



GM-38 AREA

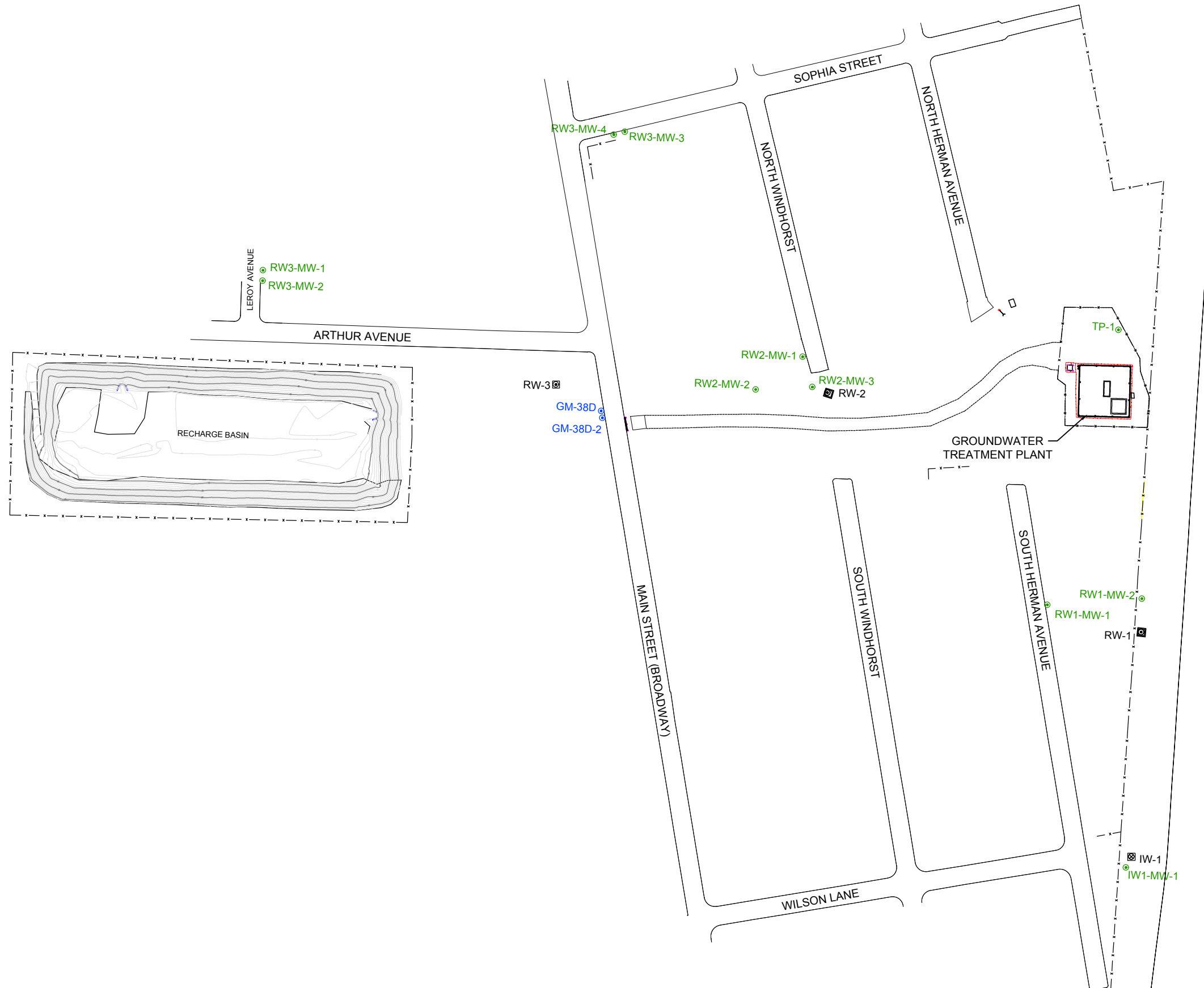


Source: U.S.G.S. Topographic Maps (7.5 Minute)
Amityville, Freeport, Hicksville, Huntington, NY Quadrangles

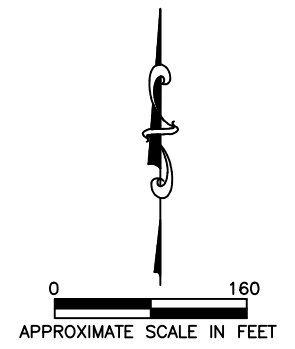
U.S. Navy RAC Engineering Field Activity, Northeast GM-38 Area (Offsite) NWIRP Bethpage Bethpage, NY
Figure 1 Site Location Map

Legend

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



(SEAFORD-OYSTER BAY EXPRESSWAY - RTE 135)



SITE MAP			
NWIRP BETHPAGE GM-38 AREA BETHPAGE, NEW YORK			
KOMAN Government Solutions, LLC 180 Gordon Drive, Suite 110, Exton, PA 19341			
SCALE	DATE	FIGURE	
SEE BARSCALE	01/15/2018	3	

- 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
 - NS Not Sampled
 - DCE Dichloroethene
 - PCE Tetrachloroethane
 - TCE Trichloroethane
 - VC Vinyl Chloride

Notes:
 All concentrations reported in µg/L.

Monitoring wells were sampled on a semi-annual basis. Recovery well RW-1 was sampled on a monthly basis. Recovery well RW-3, previously an active extraction well sampled on a monthly basis, was taken off-line on 7/1/15. RW-3 is now sampled semi-annually, in conjunction with the semi-annual LTM events.

RW3-MW2	3/05/2019
cis-1,2-DCE	1.10 J
PCE	ND
TCE	118
VC	ND

RW3-MW1	3/05/2019
cis-1,2-DCE	ND
PCE	ND
TCE	19.3
VC	ND

RW3-MW4	3/05/2019
cis-1,2-DCE	0.351 J
PCE	ND
TCE	2.12 J
VC	ND

RW3-MW3	3/05/2019	3/05/2019-Dup
cis-1,2-DCE	0.840 J	0.805 J
PCE	ND	ND
TCE	151	147
VC	ND	ND

RW2-MW1	3/07/2019
cis-1,2-DCE	2.42 J
PCE	ND
TCE	9.65
VC	ND

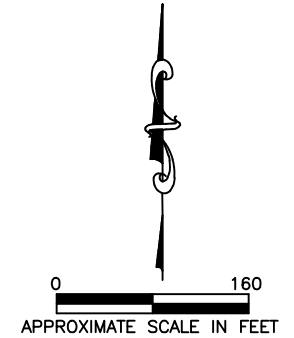
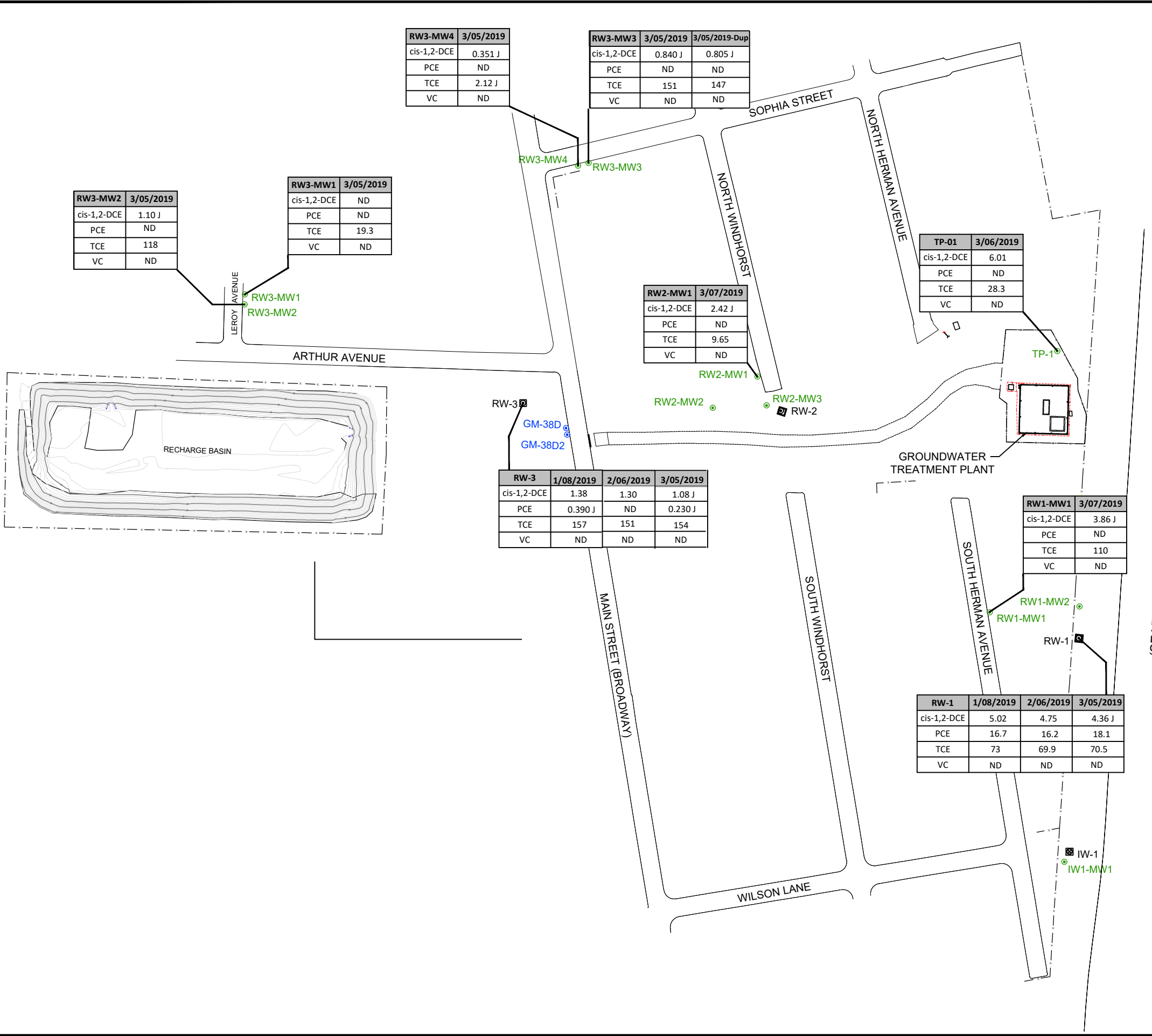
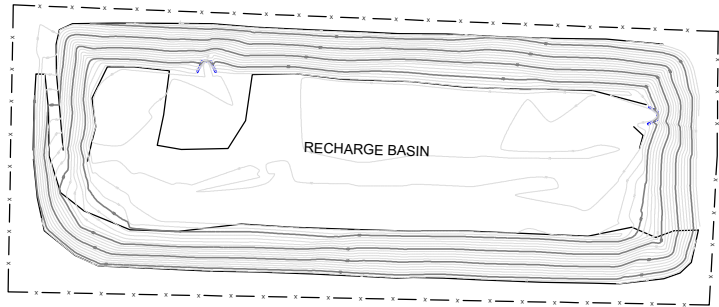
TP-01	3/06/2019
cis-1,2-DCE	6.01
PCE	ND
TCE	28.3
VC	ND

RW1-MW3	3/07/2019
cis-1,2-DCE	0.398 J
PCE	ND
TCE	4.49 J
VC	ND

RW-3	1/08/2019	2/06/2019	3/05/2019
cis-1,2-DCE	1.38	1.30	1.08 J
PCE	0.390 J	ND	0.230 J
TCE	157	151	154
VC	ND	ND	ND

RW1-MW1	3/07/2019
cis-1,2-DCE	3.86 J
PCE	ND
TCE	110
VC	ND

RW-1	1/08/2019	2/06/2019	3/05/2019
cis-1,2-DCE	5.02	4.75	4.36 J
PCE	16.7	16.2	18.1
TCE	73	69.9	70.5
VC	ND	ND	ND



1st QUARTER 2019 GROUNDWATER ANALYTICAL MAP SELECT VOC CONCENTRATIONS			
NWIRP BETHPAGE GM-38 AREA BETHPAGE, NEW YORK			
KOMAN Government Solutions, LLC 180 Gordon Drive, Suite 110, Exton, PA 19341			
SCALE	DATE	FIGURE	
SEE BARSCALE	05/20/2019	4	

Figure 5
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW1

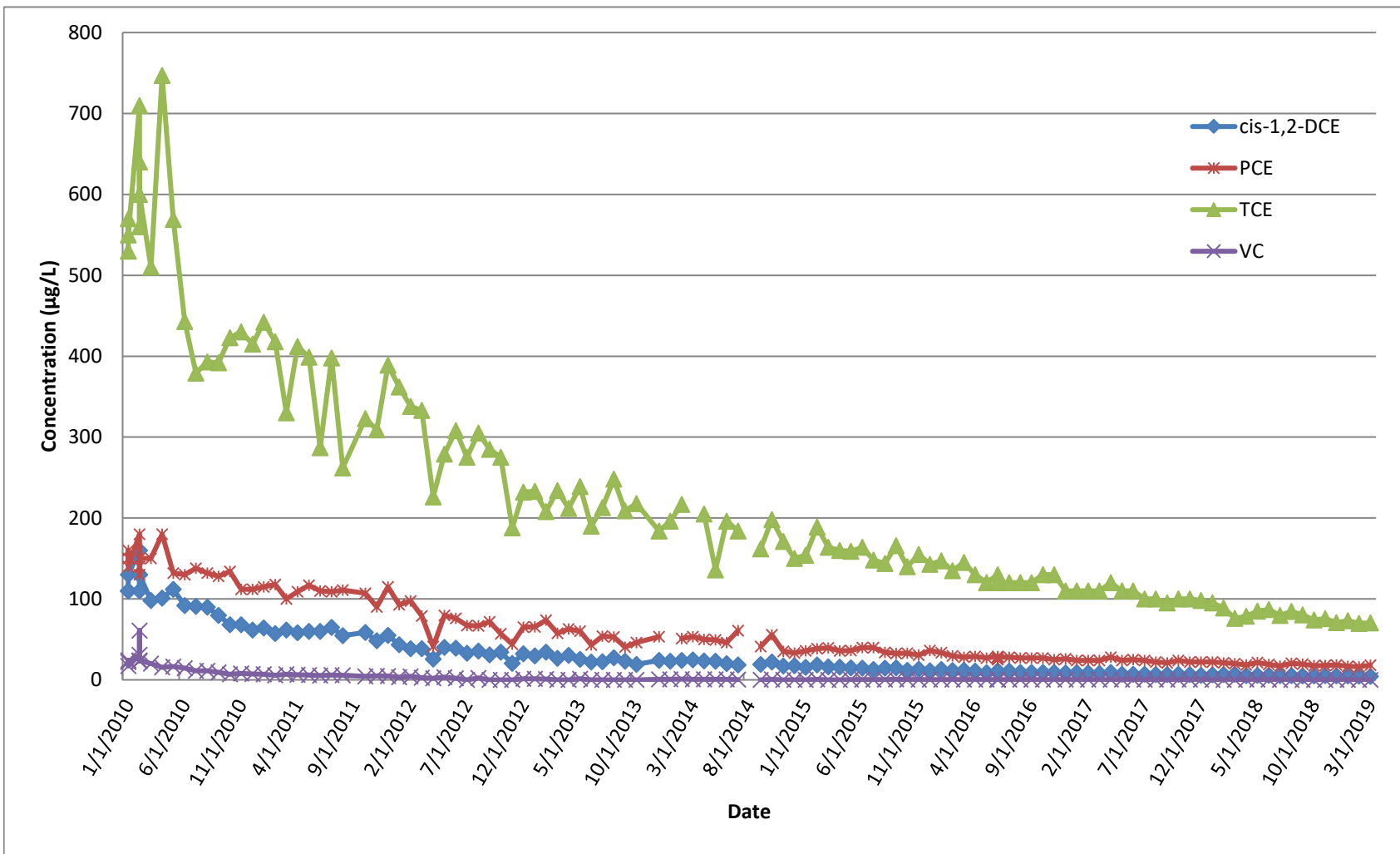


Figure 6a
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW3

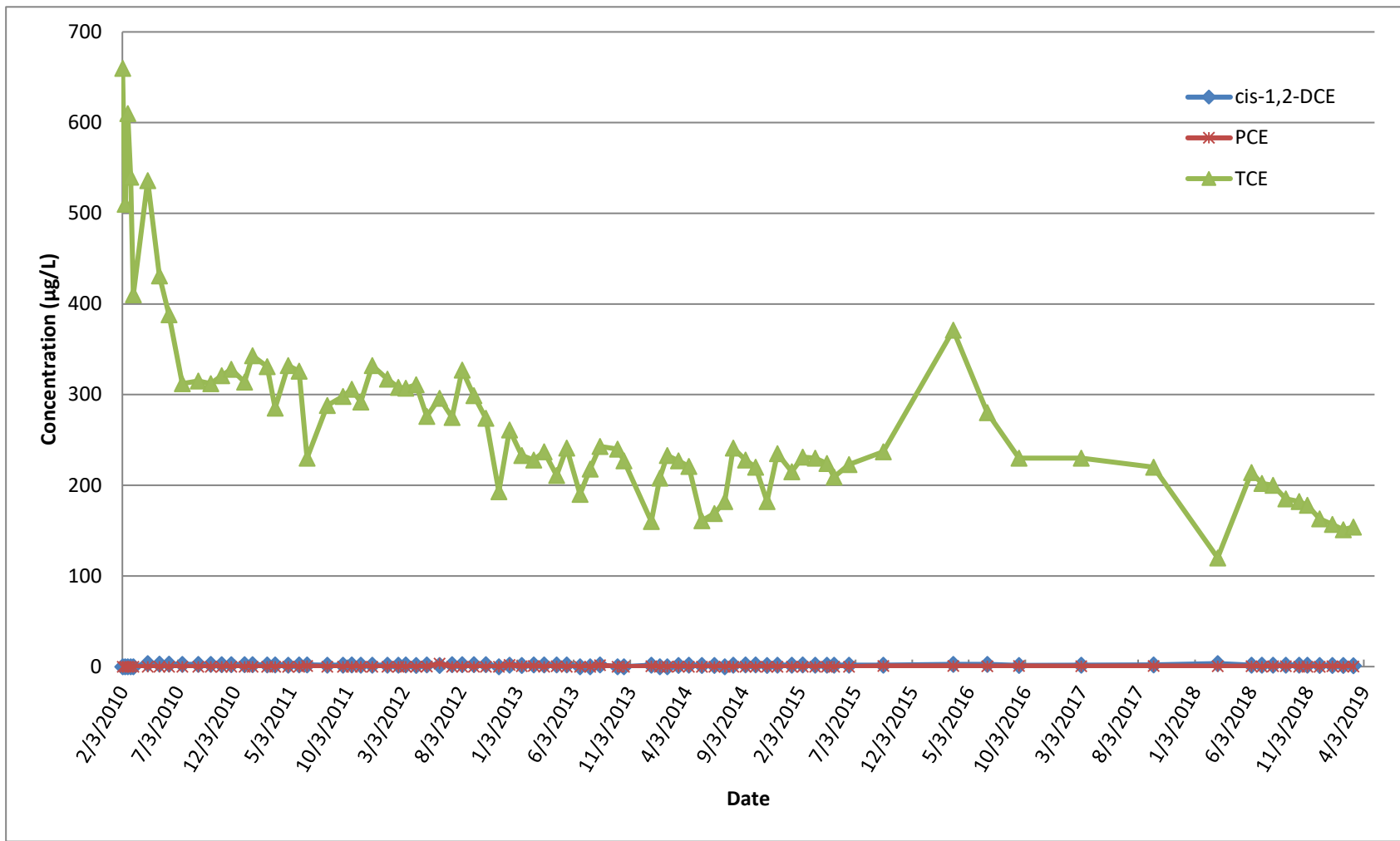


Figure 6b
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW3

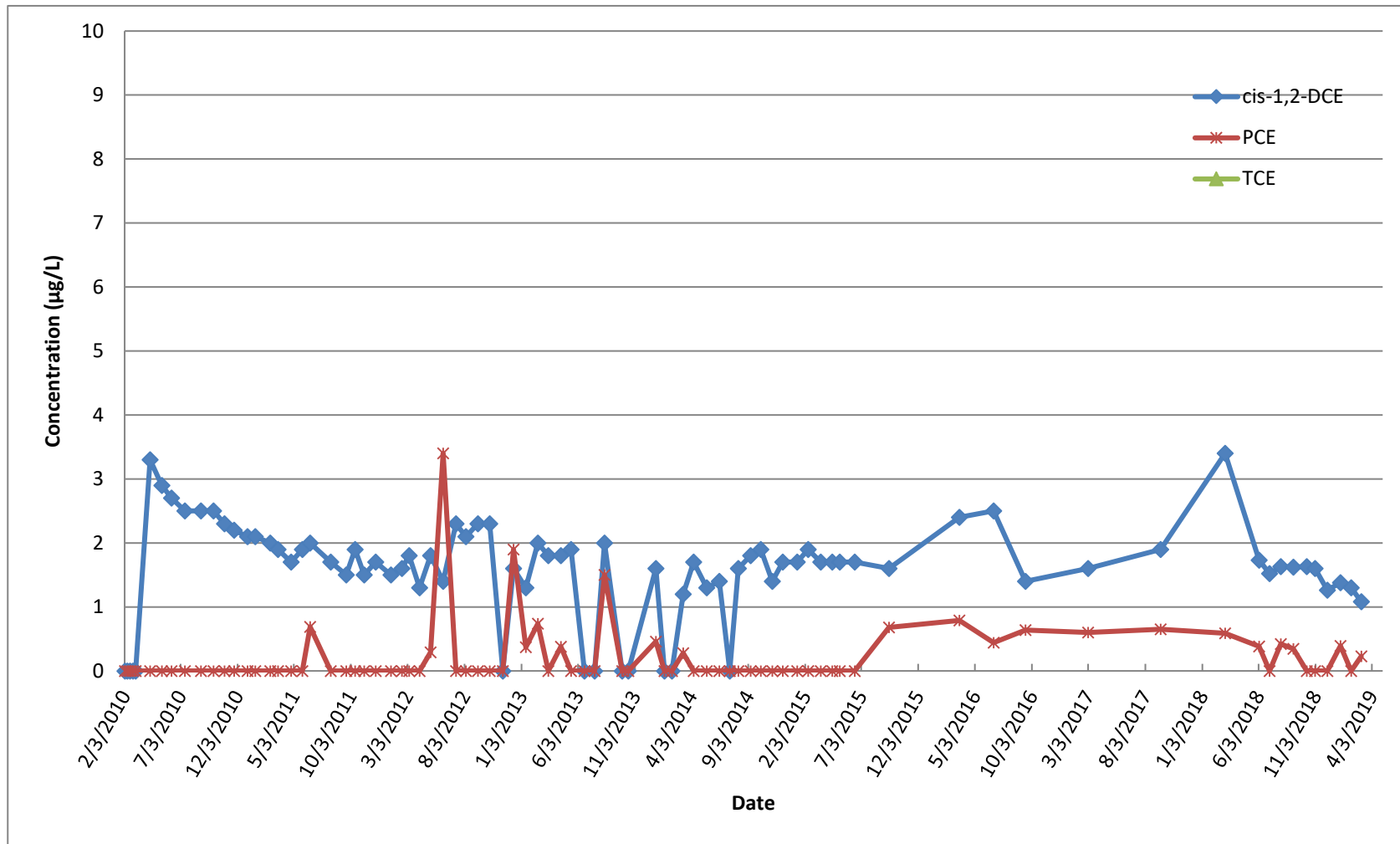


Figure 7
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW1-MW1

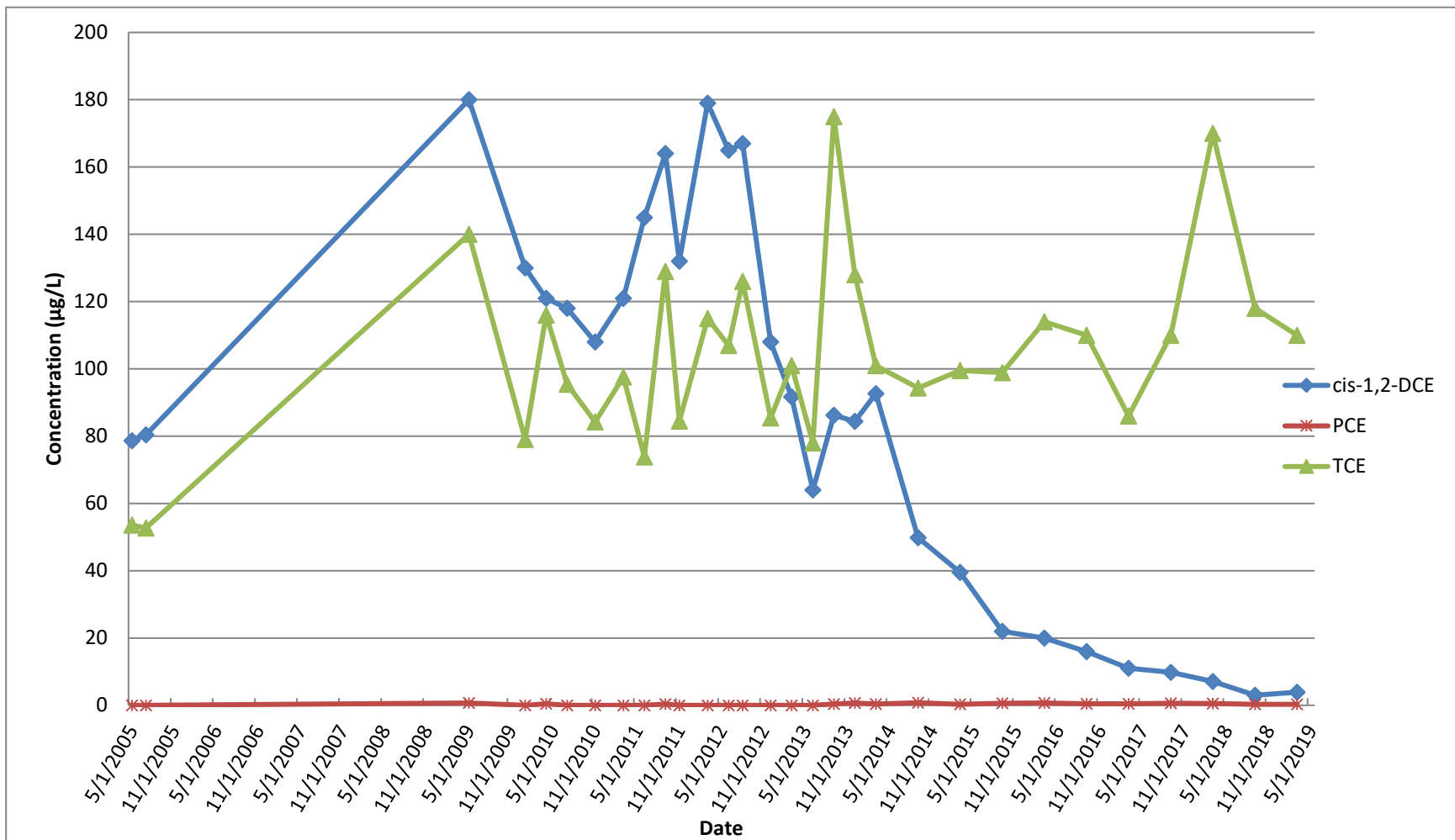


Figure 8
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW1-MW3

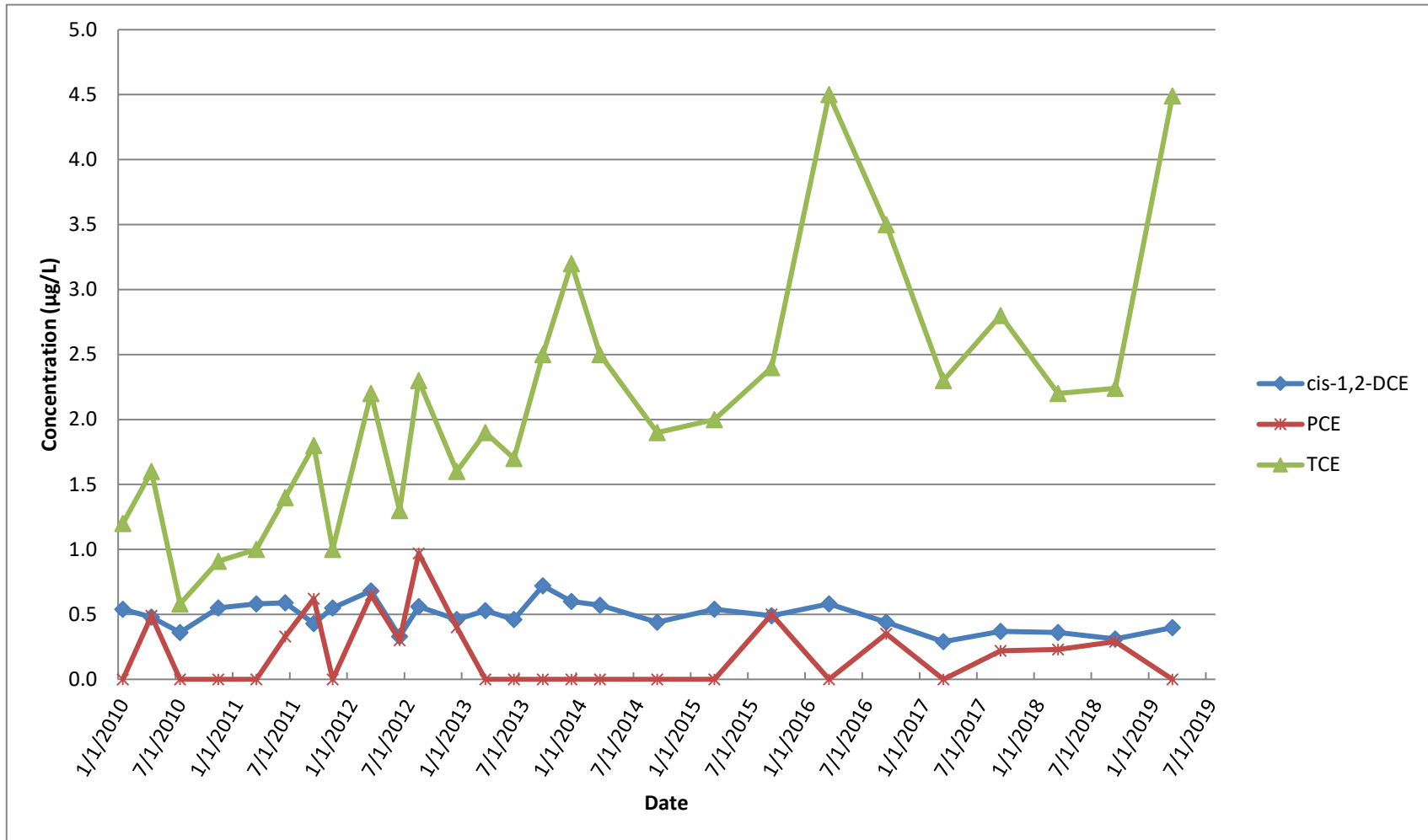


Figure 9
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW2-MW1

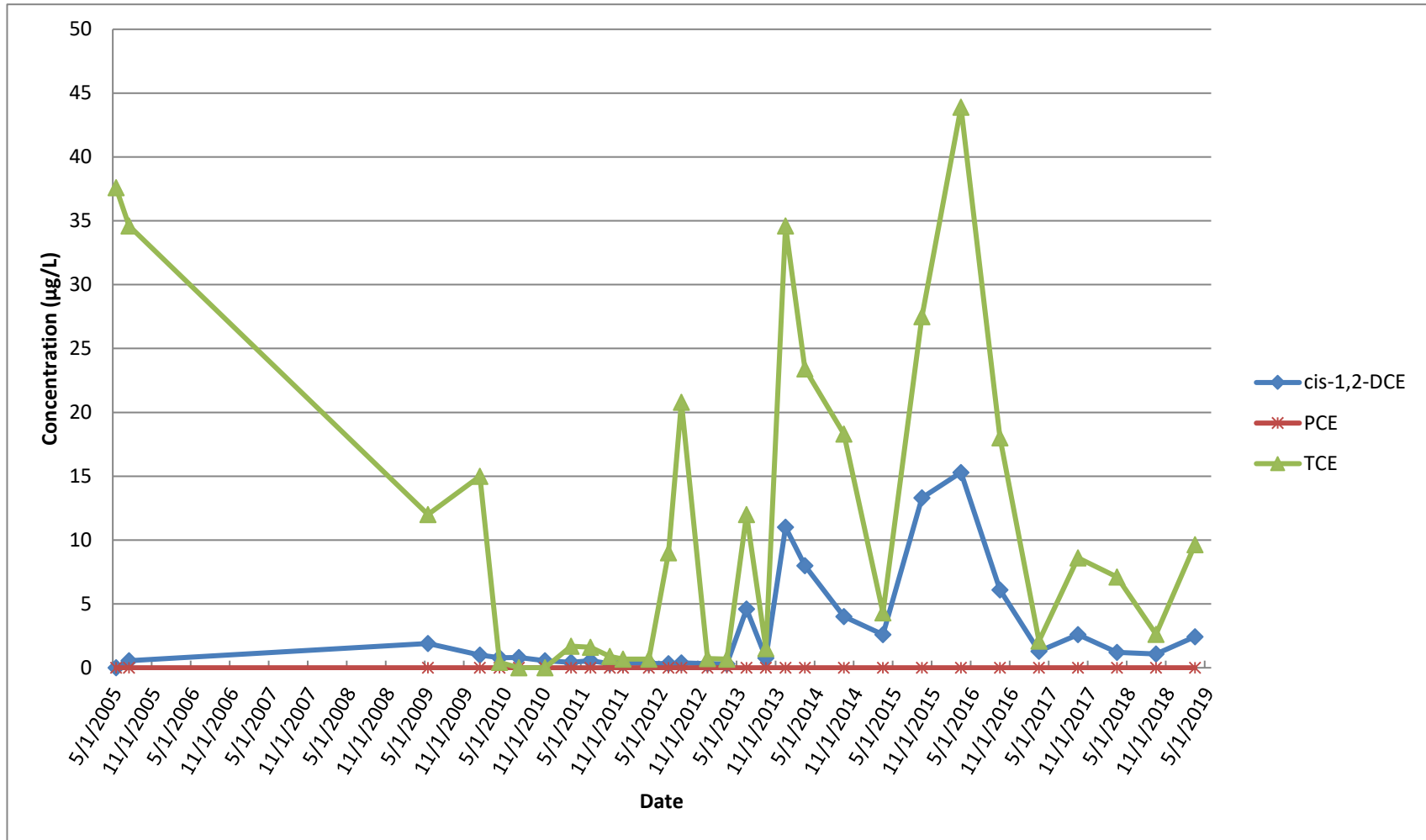


Figure 10
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW3-MW1

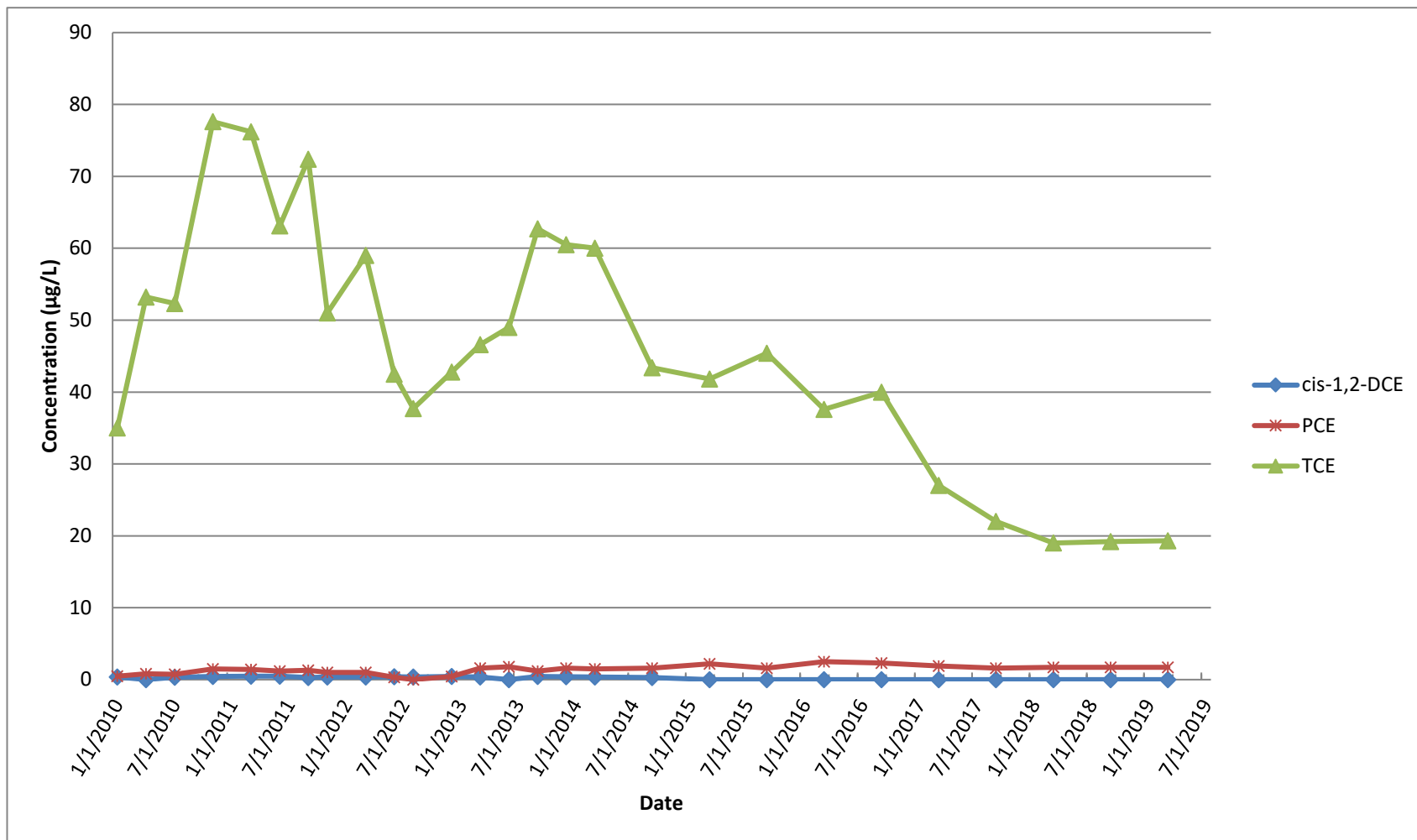


Figure 11
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW3-MW2

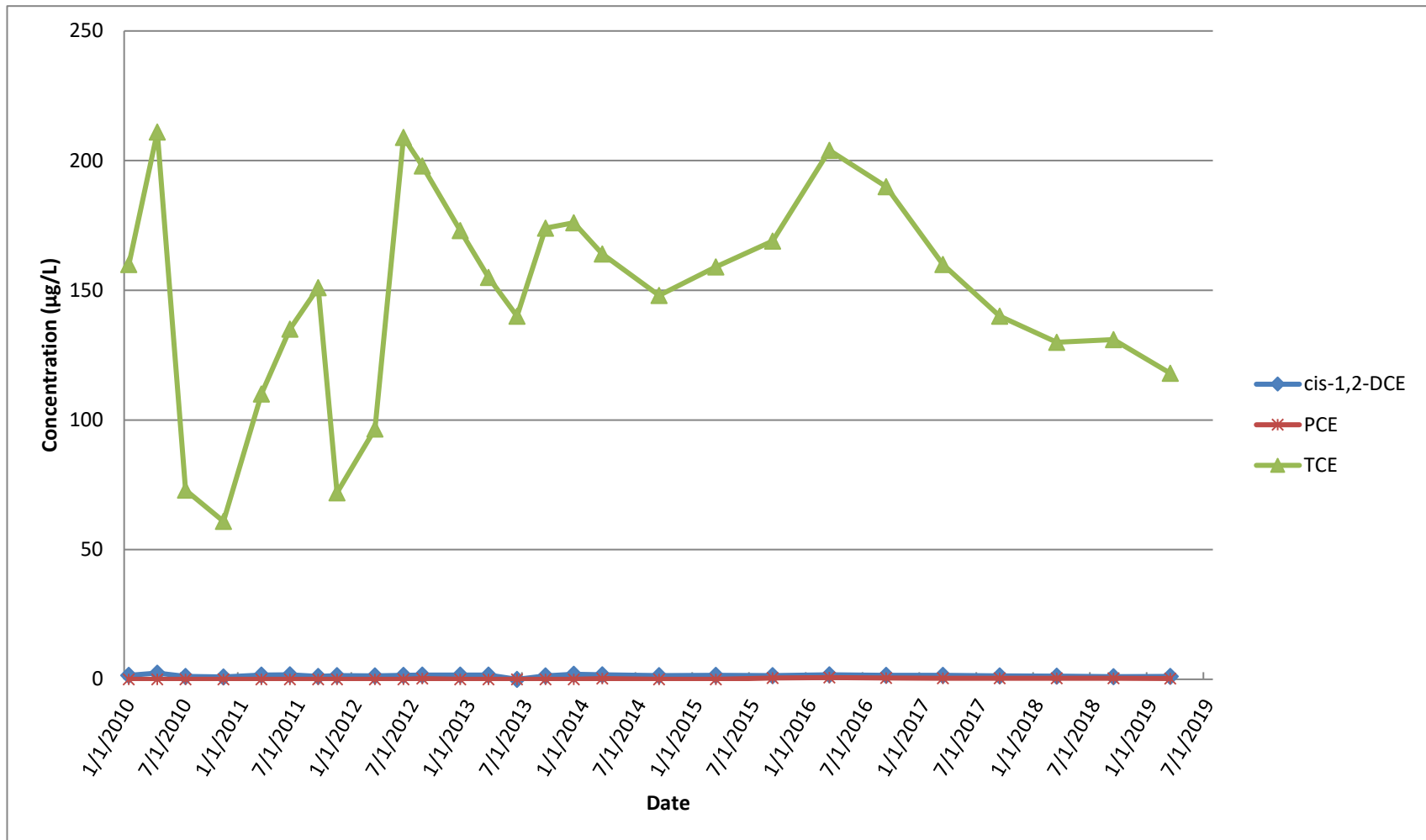


Figure 12
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW3-MW3

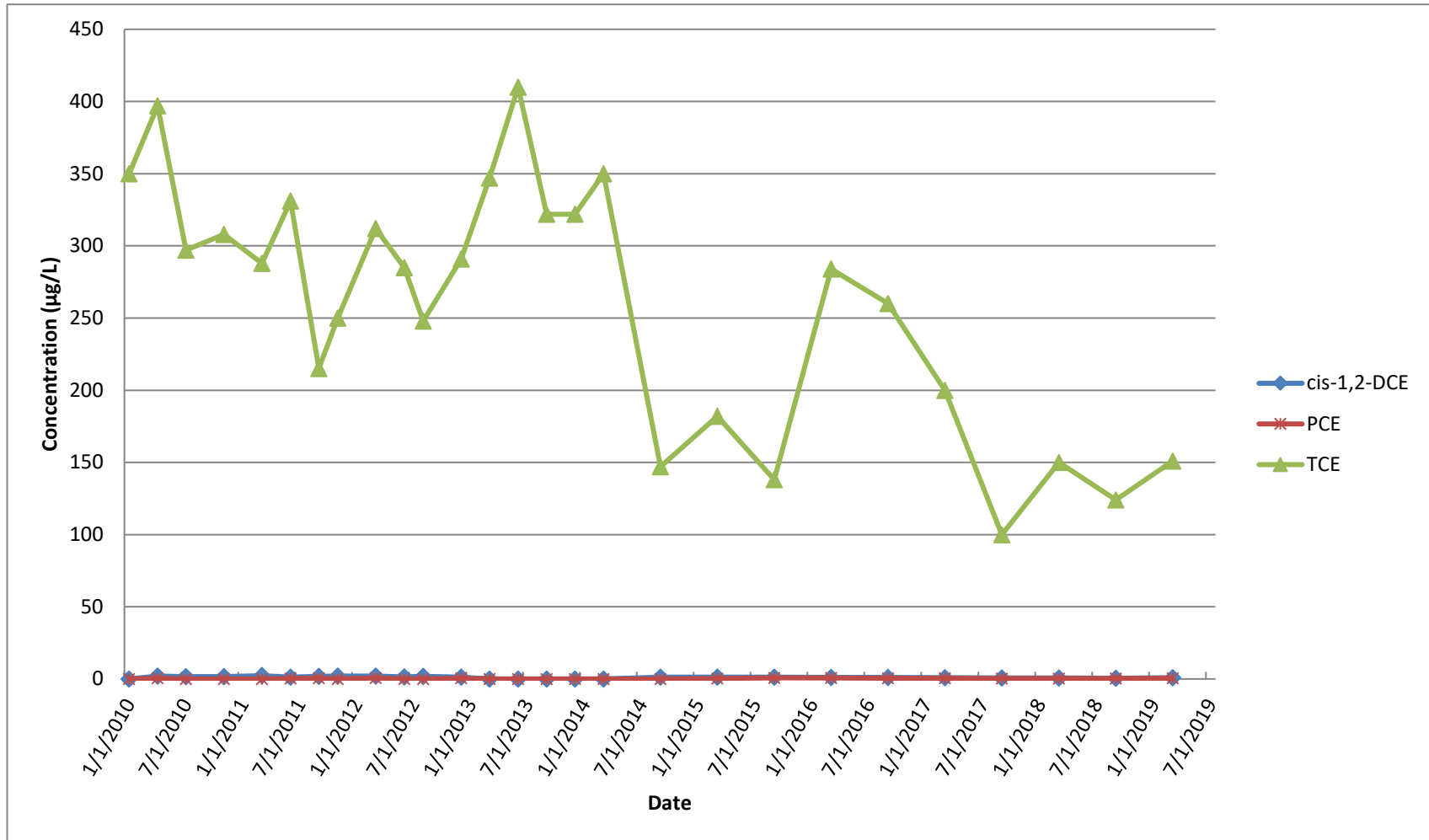


Figure 13
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
RW3-MW4

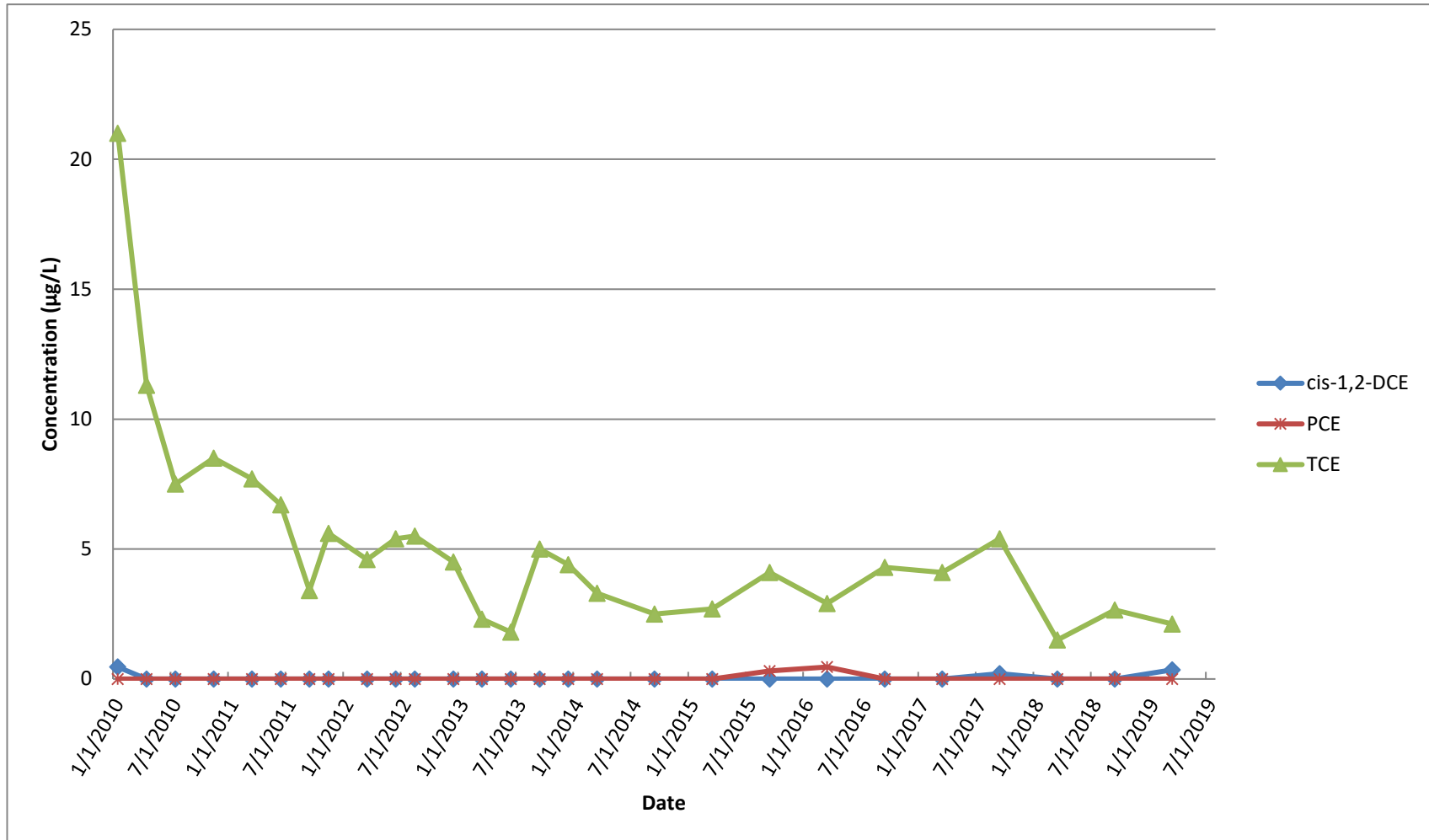
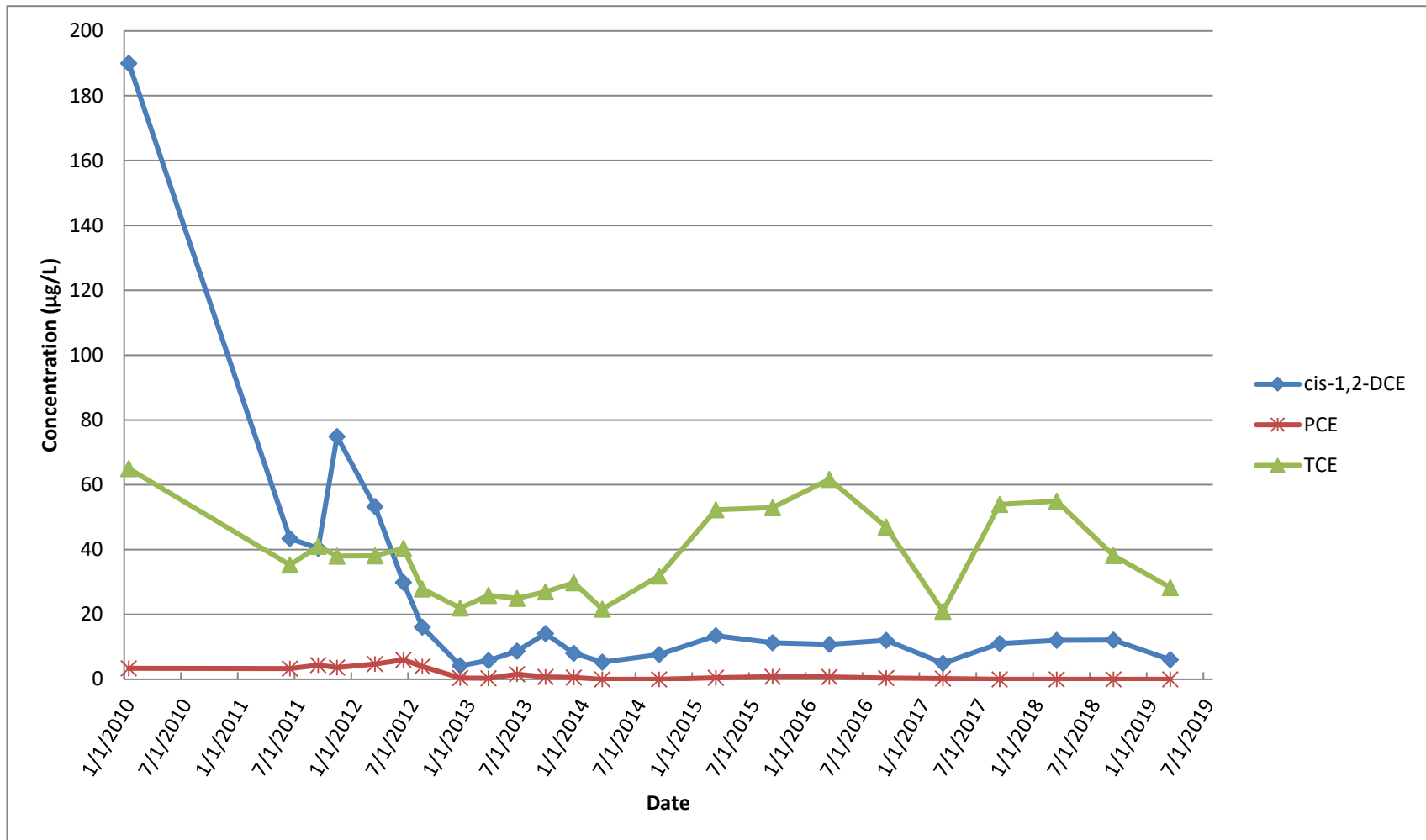


Figure 14
GM-38 Area Groundwater Remediation
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Groundwater Concentration Trends of Select VOCs
TP-01



APPENDIX A

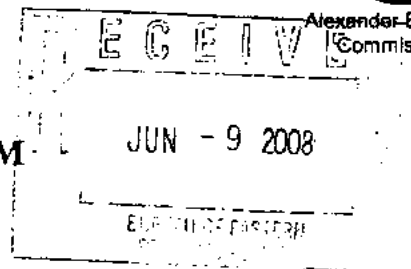
**NYSDEC EFFLUENT LIMITATIONS AND MONITORING
REQUIREMENTS AND MONTHLY DMRS**

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 S. 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, 2009and 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.

Naval Weapons Industrial Reserve Plant

DER site # 1-01-001

Page 1 of 2

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.

JANUARY 2019



8 February 2019

Mr. Jason Pelton
New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
625 Broadway
Albany, NY 12233-7252

**Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT
GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2
JANUARY 2019 REPORTING PERIOD**

Dear Mr. Pelton:

KOMAN Government Solutions, LLC (KGS) 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, and the SPDES Permit Equivalent # 13003B.

GWTP operational data from 1 January to 31 January 2019 are presented in Attachment A. In the January reporting period, no significant downtime was recorded for the GM38.

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

Please contact me at 610-400-0622 with any questions or concerns you may have regarding this report.

Sincerely,

KOMAN Government Solutions, LLC

Stephane Roy
Project Manager

Attachment A: Groundwater and Air Sampling Results from January 2019

Cc: S. Edwards, NYSDEC
D. Hesler, NYSDEC
C. Haas, NYSDEC Region 1
W. Parish, NYSDEC Region 1
R. Wither, NYSDEC Division of Water

J. Pilewski, NYSDEC – Region 1 Water Engineer
S. Karpinski, NYSDOH
J. Lovejoy, NCDH
L. Thantu, USEPA Region 2
G. Ennis, Nassau County Department of Public Works
S. Urban, Nassau County Department of Public Works
T. Licata, Town of Oyster Bay
M. Russo, Town of Oyster Bay
L. Fly, NAVFAC Mid-Atlantic
B. Murray, NAVFAC Mid-Atlantic RPM
G. Pearman, NWIRP Bethpage
GM-38 Copy

ATTACHMENT A
GROUNDWATER AND AIR SAMPLING RESULTS
JANUARY 2019

**GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Report
January 2019**

SPDES Parameters	January 2019 ⁽¹⁾					
	Daily Treated Effluent Maximum ⁽¹⁾	Units	RW-1	RW-3 ⁽²⁾	Combined Influent ⁽³⁾ (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		1/8/19			
Effective Flowrate	1100	GPM	657	178	836	887
Total Flow	N/A	gallons	29,332,100	7,967,200	37,299,300	39,585,100
pH	5.5 - 8.5	SU	5.06	5.14	5.08	6.16
Chloroform	5	µg/L	0.330 J	0.300 J	0.324 J	ND (1.0)
1,1-Dichloroethane	5	µg/L	1.39	1.82	1.48	ND (1.0)
1,2-Dichloroethane	0.6	µg/L	0.230 J	ND (1.0)	0.181 J	ND (1.0)
1,1-Dichloroethene	5	µg/L	0.910 J	1.00	0.93	ND (1.0)
cis 1,2-Dichloroethene	5	µg/L	5.02	1.38	4.24	ND (1.0)
trans 1,2-Dichloroethene	5	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Tetrachloroethene	5	µg/L	16.7	0.390 J	13.22	ND (1.0)
1,1,1-Trichloroethane	5	µg/L	0.660 J	0.600 J	0.647 J	ND (1.0)
Trichloroethene	5	µg/L	73.0	157	90.9	ND (1.0)
1,1,2-Trichlorotrifluoroethane	5	µg/L	ND (1.0)	0.880 J	0.19 J	ND (1.0)
Vinyl Chloride	2	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-Dioxane	--	µg/L	NS	NS	NS	3.1
Mercury	0.00025	mg/L	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Total Suspended Solids (TSS)	N/A	mg/L	ND (1.0)	5.8	1.2	ND (1.0)

Notes:

J - Estimated result between laboratory method detection limit and reporting limit

D - Concentration is a result of a dilution.

ND - Not detected above laboratory method detection limit. Reporting Limit (RL) given in parentheses.

NR - Not Recorded

N/A - Not Applicable

NS - Not Sampled

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

(2) Well RW-3 was placed back in operation on 1 June, 2018.

(3) 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
Air Sampling Results
January 2019**

DAR Parameters		Discharge Goal ⁽¹⁾	January 2019	
			Influent	Effluent
Process Stream				
Sampling Date			1/8/19	
Average Flowrate	CFM	N/A	NR	9,420
Total Flow	ft ³	N/A	NR	416,542,836
Total Flow	m ³	N/A	NR	11,795,180
1,2-Dichloroethane	µg/m ³	N/A	2.5 J	ND
cis 1,2-Dichloroethene	µg/m ³	> 100,000 ⁽²⁾	39	46
trans 1,2-Dichloroethene	µg/m ³		ND	ND
1,2-Dichloroethene (total)	µg/m ³	>100,000	39	48
Toluene	µg/m ³	N/A	0.52 J	0.86 J
Total Xylene	µg/m ³	N/A	ND	ND
1,1,2-Trichloroethane	µg/m ³	N/A	1.7 J	ND
Trichloroethene	µg/m ³	2,600	1400	6.6
Vinyl Chloride	µg/m ³	560	ND	ND
Tetrachloroethene	µg/m ³	5,100	180	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

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

(2) Discharge goal is for total 1,2-Dichloroethene.

**GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
January 2019**

DAR Parameters	Units	Discharge Goal ⁽¹⁾	January 2019
Sampling Date			1/8/19
Average Flowrate	CFM	N/A	9,420
Total Flow	ft ³	N/A	416,542,836
Total Flow	m ³	N/A	11,795,180
Trichloroethene	lb/hr	0.09	0.00023
Vinyl Chloride	lb/hr	0.02	0.00000
1,2 Dichloroethene	lb/hr	11	0.00168
1,2-Dichloroethane	lb/hr	N/A	0.00000
Toluene	lb/hr	N/A	0.00003
Total Xylene	lb/hr	N/A	0.00000
1,1,2-Trichloroethane	lb/hr	N/A	0.00000
Tetrachloroethene	lb/hr	0.18	0.00000

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

N/A - Not Applicable

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

FEBRUARY 2019



7 March 2019

Mr. Jason Pelton
New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
625 Broadway
Albany, NY 12233-7252

**Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT
GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2
FEBRUARY 2019 REPORTING PERIOD**

Dear Mr. Pelton:

KOMAN Government Solutions, LLC (KGS) 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, and the SPDES Permit Equivalent # 13003B.

GWTP operational data from 1 February to 28 February 2019 are presented in Attachment A. In the February reporting period, no significant downtime was recorded for the GM38.

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

Please contact me at 610-400-0622 with any questions or concerns you may have regarding this report.

Sincerely,

KOMAN Government Solutions, LLC

Stephane Roy
Project Manager

Attachment A: Groundwater and Air Sampling Results from February 2019

Cc: S. Edwards, NYSDEC
D. Hesler, NYSDEC
C. Haas, NYSDEC Region 1
W. Parish, NYSDEC Region 1
R. Wither, NYSDEC Division of Water

J. Pilewski, NYSDEC – Region 1 Water Engineer
S. Karpinski, NYSDOH
J. Lovejoy, NCDH
L. Thantu, USEPA Region 2
G. Ennis, Nassau County Department of Public Works
S. Urban, Nassau County Department of Public Works
T. Licata, Town of Oyster Bay
M. Russo, Town of Oyster Bay
L. Fly, NAVFAC Mid-Atlantic
B. Murray, NAVFAC Mid-Atlantic RPM
G. Pearman, NWIRP Bethpage
GM-38 Copy

ATTACHMENT A
GROUNDWATER AND AIR SAMPLING RESULTS
FEBRUARY 2019

**GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Report
February 2019**

SPDES Parameters	February 2019 ⁽¹⁾					
	Daily Treated Effluent Maximum ⁽¹⁾	Units	RW-1	RW-3 ⁽²⁾	Combined Influent ⁽³⁾ (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		2/6/19			
Effective Flowrate	1100	GPM	658	174	832	882
Total Flow	N/A	gallons	26,522,500	7,026,600	33,549,100	35,553,500
pH	5.5 - 8.5	SU	5.08	5.14	5.09	6.14
Chloroform	5	µg/L	ND (1.0)	0.290 J	0.061 J	ND (1.0)
1,1-Dichloroethane	5	µg/L	1.37	1.87	1.47	ND (1.0)
1,2-Dichloroethane	0.6	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,1-Dichloroethene	5	µg/L	0.790 J	0.990 J	0.83 J	ND (1.0)
cis 1,2-Dichloroethene	5	µg/L	4.75	1.30	4.03	ND (1.0)
trans 1,2-Dichloroethene	5	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Tetrachloroethene	5	µg/L	16.2	ND (1.0)	12.81	ND (1.0)
1,1,1-Trichloroethane	5	µg/L	0.550 J	0.530 J	0.546 J	ND (1.0)
Trichloroethene	5	µg/L	69.9	151	86.9	ND (1.0)
1,1,2-Trichlorotrifluoroethane	5	µg/L	ND (1.0)	0.720 J	0.15 J	ND (1.0)
Vinyl Chloride	2	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-Dioxane	--	µg/L	NS	NS	NS	3.2
Mercury	0.00025	mg/L	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Total Suspended Solids (TSS)	N/A	mg/L	ND (1.0)	3.9	0.8	ND (1.0)

Notes:

J - Estimated result between laboratory method detection limit and reporting limit

D - Concentration is a result of a dilution.

ND - Not detected above laboratory method detection limit. Reporting Limit (RL) given in parentheses.

NR - Not Recorded

N/A - Not Applicable

NS - Not Sampled

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

(2) Well RW-3 was placed back in operation on 1 June, 2018.

(3) 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
Air Sampling Results
February 2019**

DAR Parameters		Discharge Goal ⁽¹⁾	February 2019	
			Influent	Effluent
Process Stream				
Sampling Date			2/19/19	
Average Flowrate	CFM	N/A	NR	9,526
Total Flow	ft ³	N/A	NR	384,076,800
Total Flow	m ³	N/A	NR	10,875,844
1,2-Dichloroethane	µg/m ³	N/A	2.0 J	ND
cis 1,2-Dichloroethene	µg/m ³	> 100,000 ⁽²⁾	47	58
trans 1,2-Dichloroethene	µg/m ³		0.93 J	1.1 J
1,2-Dichloroethene (total)	µg/m ³	>100,000	48	59
Toluene	µg/m ³	N/A	3.5	ND
Total Xylene	µg/m ³	N/A	ND	ND
1,1,2-Trichloroethane	µg/m ³	N/A	2.0 J	ND
Trichloroethene	µg/m ³	2,600	1100	ND
Vinyl Chloride	µg/m ³	560	1.2 J	ND
Tetrachloroethene	µg/m ³	5,100	160	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

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

(2) Discharge goal is for total 1,2-Dichloroethene.

**GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
February 2019**

DAR Parameters	Units	Discharge Goal ⁽¹⁾	February 2019
Sampling Date			2/19/19
Average Flowrate	CFM	N/A	9,526
Total Flow	ft ³	N/A	384,076,800
Total Flow	m ³	N/A	10,875,844
Trichloroethene	lb/hr	0.09	0.00000
Vinyl Chloride	lb/hr	0.02	0.00000
1,2 Dichloroethene	lb/hr	11	0.00211
1,2-Dichloroethane	lb/hr	N/A	0.00000
Toluene	lb/hr	N/A	0.00000
Total Xylene	lb/hr	N/A	0.00000
1,1,2-Trichloroethane	lb/hr	N/A	0.00000
Tetrachloroethene	lb/hr	0.18	0.00000

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

N/A - Not Applicable

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

MARCH 2019



8 April 2019

Mr. Jason Pelton
New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials
625 Broadway
Albany, NY 12233-7252

**Subject: GROUNDWATER DISCHARGE MONITORING/AIR EMISSION REPORT
GM-38 AREA, NWIRP BETHPAGE, NY; DER SITE # 1-30-003B-OU 2
MARCH 2019 REPORTING PERIOD**

Dear Mr. Pelton:

KOMAN Government Solutions, LLC (KGS) 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, and the SPDES Permit Equivalent # 13003B.

GWTP operational data from 1 March to 31 March 2019 are presented in Attachment A. In the March reporting period, no significant downtime was recorded for the GM38.

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

Please contact me at 610-400-0622 with any questions or concerns you may have regarding this report.

Sincerely,

KOMAN Government Solutions, LLC

Stephane Roy
Project Manager

Attachment A: Groundwater and Air Sampling Results from March 2019

Cc: S. Edwards, NYSDEC
D. Hesler, NYSDEC
C. Haas, NYSDEC Region 1
W. Parish, NYSDEC Region 1
R. Wither, NYSDEC Division of Water

J. Pilewski, NYSDEC – Region 1 Water Engineer
S. Karpinski, NYSDOH
J. Lovejoy, NCDH
L. Thantu, USEPA Region 2
G. Ennis, Nassau County Department of Public Works
S. Urban, Nassau County Department of Public Works
T. Licata, Town of Oyster Bay
M. Russo, Town of Oyster Bay
L. Fly, NAVFAC Mid-Atlantic
B. Murray, NAVFAC Mid-Atlantic RPM
G. Pearman, NWIRP Bethpage
GM-38 Copy

ATTACHMENT A
GROUNDWATER AND AIR SAMPLING RESULTS
MARCH 2019

**GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Discharge Monitoring Report
March 2019**

SPDES Parameters	March 2019 ⁽¹⁾					
	Daily Treated Effluent Maximum ⁽¹⁾	Units	RW-1	RW-3 ⁽²⁾	Combined Influent ⁽³⁾ (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		3/5/19			
Effective Flowrate	1100	GPM	625	164	788	836
Total Flow	N/A	gallons	27,888,822	7,307,145	35,195,966	37,299,439
pH	5.5 - 8.5	SU	5.07	5.17	5.09	6.27
Chloroform	5	µg/L	0.300 J	0.280 J	0.30 J	ND (1.0)
1,1-Dichloroethane	5	µg/L	1.28 J	1.71 J	1.37 J	ND (1.0)
1,2-Dichloroethane	0.6	µg/L	0.210 J	ND (1.0)	0.17 J	ND (1.0)
1,1-Dichloroethene	5	µg/L	0.700 J	1.01 J	0.76 J	ND (1.0)
cis 1,2-Dichloroethene	5	µg/L	4.36 J	1.08 J	3.68 J	ND (1.0)
trans 1,2-Dichloroethene	5	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Tetrachloroethene	5	µg/L	18.1	0.230 J	14.39	ND (1.0)
1,1,1-Trichloroethane	5	µg/L	0.560 J	0.490 J	0.545 J	ND (1.0)
Trichloroethene	5	µg/L	70.5	154	87.8	ND (1.0)
1,1,2-Trichlorotrifluoroethane	5	µg/L	ND (1.0)	0.780 J	0.16 J	ND (1.0)
Vinyl Chloride	2	µg/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-Dioxane	--	µg/L	NS	NS	NS	2.8
Mercury	0.00025	mg/L	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Total Suspended Solids (TSS)	N/A	mg/L	ND (1.0)	2.6	0.5	ND (1.0)

Notes:

J - Estimated result between laboratory method detection limit and reporting limit

D - Concentration is a result of a dilution.

ND - Not detected above laboratory method detection limit. Reporting Limit (RL) given in parentheses.

NR - Not Recorded

N/A - Not Applicable

NS - Not Sampled

(1) Wastewater discharge equivalence permit renewed on 18 August 2017. Discharge limits established for 10 years. Chloroform, 1,4-dioxane and 1,1,2-trichlorotrifluoroethane are now monitored under the new permit.

(2) Well RW-3 was placed back in operation on 1 June, 2018.

(3) 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
Air Sampling Results
March 2019**

DAR Parameters		Discharge Goal ⁽¹⁾	March 2019	
			Influent	Effluent
Process Stream				
Sampling Date			3/5/19	
Average Flowrate	CFM	N/A	NR	9,460
Total Flow	ft ³	N/A	NR	422,304,464
Total Flow	m ³	N/A	NR	11,958,331
1,2-Dichloroethane	µg/m ³	N/A	1.9 J	ND
cis 1,2-Dichloroethene	µg/m ³	> 100,000 ⁽²⁾	44	55
trans 1,2-Dichloroethene	µg/m ³		ND	ND
1,2-Dichloroethene (total)	µg/m ³	>100,000	44	55
Toluene	µg/m ³	N/A	0.49 J	ND
Total Xylene	µg/m ³	N/A	ND	ND
1,1,2-Trichloroethane	µg/m ³	N/A	ND	ND
Trichloroethene	µg/m ³	2,600	1100	1.1 J
Vinyl Chloride	µg/m ³	560	0.74 J	0.66 J
Tetrachloroethene	µg/m ³	5,100	160	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

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

(2) Discharge goal is for total 1,2-Dichloroethene.

**GM-38 Area Groundwater Remediation
Groundwater Treatment Plant
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Controlled Stack Emissions
March 2019**

DAR Parameters	Units	Discharge Goal ⁽¹⁾	March 2019
Sampling Date			3/5/19
Average Flowrate	CFM	N/A	9,460
Total Flow	ft ³	N/A	422,304,464
Total Flow	m ³	N/A	11,958,331
Trichloroethene	lb/hr	0.09	0.00004
Vinyl Chloride	lb/hr	0.02	0.00002
1,2 Dichloroethene	lb/hr	11	0.00195
1,2-Dichloroethane	lb/hr	N/A	0.00000
Toluene	lb/hr	N/A	0.00000
Total Xylene	lb/hr	N/A	0.00000
1,1,2-Trichloroethane	lb/hr	N/A	0.00000
Tetrachloroethene	lb/hr	0.18	0.00000

Notes:

CFM - cubic feet per minute

DAR - Division of Air Resources

N/A - Not Applicable

(1) Discharge goal as approved by NYSDEC's letter dated 31 October 2013.

APPENDIX B

**NYSDEC AIR DISCHARGE LIMIT
DOCUMENTATION**

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Action Bureau A, 12th Floor
625 Broadway, Albany, New York 12233-7015
Phone: (518) 402-9620 FAX: (518) 402-9022



Joseph Martens
Commissioner

October 31, 2013

Lora Fly
Remedial Program Manager
NAVFAC Mid-Atlantic
Northeast IPT
9742 Maryland Avenue
Norfolk, VA, 23511-3095

RE: Northrop Grumman, Naval Weapons Industrial Reserve Plant (NWIRP) and Grumman Steel Los Sites, NYSDEC Site No.'s I-30-003 A & B.

Dear Ms. Fly:

Tetra Tech NUS Inc., on behalf of the Department of the Navy NAVFAC Midlantic, has submitted an application to remove the GM 38 Area Groundwater Extraction and Treatment system impregnated Xeolite™ resin from the air discharge treatment system. Currently, the air treatment system uses a combined activated carbon with permanganate impregnated resin treatment train. The New York State Department of Environmental Conservation (NYSDEC) has reviewed the Department of the Navy application and concurs with the findings presented.

The routine monitoring, as detailed in Table 1, clearly indicates that vinyl chloride, one of the main contaminants of concern, has diminished to almost non-detect, and discharge concentrations have dropped to below the limit to require air treatment for the other contaminants as well. However, NAVFAC Midlantic is still proposing activated carbon to reduce the other discharge contaminant levels. Therefore, the NYSDEC hereby approves the proposed changes to the GM 38 Area air treatment. The Xeolite™ resin beds will remain in place should reactivation, based on routine monitoring, be required.

If you have any questions in the interim, please contact me at (518)402-9620.

Sincerely,

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

EC: J. Swartwout
S. Scharf
W. Parish, Region 1
S. Karpinski, NYSDOH
E. Hannon, NGC
D. Stern, Arcadis
D. Brayack, TTNUS



NOR-01264

November 21, 2011

Mr. Stephen Scharf
New York Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Remedial Action A
625 Broadway, 11th Floor
Albany, New York 12233-7015

Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order WE06

Subject: Proposed Modification to Discharge Limits for Off Gas Volatile Organic Compounds (VOCs)
for Air Stripping Tower
GM-38 Offsite Groundwater Treatment Plant,
NWIRP Bethpage, New York

Dear Mr. Scharf:

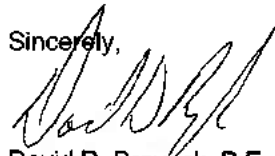
On behalf of the Navy, please find enclosed a copy of the subject document. This document presents an evaluation of current concentrations of off gas VOCs from the GM-38 groundwater treatment plant air-stripping tower (prior to treatment with granular activated carbon). Maximum emission rates were re-evaluated due to decreasing maximum concentrations of target VOCs in un-treated air stripper AS-1 off gas. In addition, breakthrough of target contaminants (e.g., cis-1,2-dichloroethene) is beginning to occur in the granular activated carbon bed. Maximum emission rates were re-evaluated to provide a determination if breakthrough of contaminants would trigger the need for a replacement of the granular activated carbon bed.

Existing Discharge Goals were established in the "Final Operation, Maintenance and Monitoring Plan for Groundwater Treatment Plant GM-38 Area Groundwater Remediation" prepared by Tetra Tech EC (April 2010). Existing goals were based on emission estimates for a 95% reduction (see Attachment A), instead of being based on the original DAR-1 analysis of air stripper off gas. Emission estimates were calculated using the air stripper design flow rate of 8,000 cubic feet per minute (cfm), and previous contaminant discharge rates in pounds per hour (lb/hr). Original emission estimates are provided in Attachment B.

Proposed Revised Discharge Goals were calculated using an average flow rate of 9,200 cfm, January to March 2011 VOC loading rates (taken from the Quarterly Operations Report First Quarter 2011 from ECOR Federal Services), and the Actual Annual % of Annual Guideline Concentrations (AGCs), taken from the revised DAR-1 Model Output. The revised DAR-1 Model Output is provided in Attachment C. Existing Discharge Goals and Proposed Revised Discharge Goals are compared in tabular format in the first page of the attachment. Proposed Revised Discharge Goals for trichloroethene (TCE) are the same as previous. The proposed limit for tetrachloroethene (PCE) is approximately 10 times the previous limit, and vinyl chloride is approximately 2 times the previous limit. Revised Discharge Goals for 1,2-dichloroethene (goals are the same for cis-1,2-dichloroethene) are 100 times greater than previously established limits. It is recommended that these revised limits replace previous discharge goals, and treatment of air stripper off gas by granular activated carbon is recommended to continue for TCE and PCE, with no treatment required for vinyl chloride and 1,2-dichloroethene.

If you have any questions please contact Ms. Lora Fly, NAVFAC Mid-LANT, at (757) 341-2012.

Sincerely,



David D. Brayack, P.E.
Project Manager

Enclosure: (1) Proposed Modification to Discharge Limits for Off Gas Volatile Organic Compounds
(VOCs) for Air Stripping Tower
GM-38 Offsite Groundwater Treatment Plant

Distribution:

Mid-Lant, Lora Fly
NYSDEC (Albany), Henry Wilkie
NYSDOH (Troy), Steve Karpinski
NAVAIR, Richard Smith
USEPA, Carol Stein
NGC, Kent Smith
Tetra Tech NUS, Dave Brayack
ECOR Solutions, Al Taormina
Administrative Record
Public Repository
Project File

TABLE 1
COMPARISON OF EXISTING DISCHARGE GOALS WITH ACTUAL EMISSIONS AND PROPOSED DISCHARGE GOALS
AIR STRIPPING TOWER GM-38 OFFSITE GROUNDWATER TREATMENT PLANT
NWIRP BETHPAGE, NEW YORK

Chemical	Existing Discharge Goal		Actual January to March 2011 Values (Pre-Off Gas Treatment)		Proposed Revised Discharge Goals based on DAR-1 Analysis	
	Existing Discharge Loading Rate (pounds (lbs)/hour) ⁽¹⁾	Equivalent Existing Discharge Goals (µg/m ³) ⁽²⁾	Actual Jan-Mar 2011 Concentration (µg/m ³) ⁽³⁾	Actual VOC Loading Pre-Off Gas Treatment (lbs/hour) ⁽⁴⁾	Proposed Discharge Loading Rate (lbs/hour) ⁽⁵⁾	Equivalent Proposed Discharge Goal (µg/m ³) ⁽⁵⁾
TCE	0.09	2,600	10,000	0.345	0.09	2,600
PCE	0.02	580	6,800	0.234	0.18	5,100
Vinyl Chloride	0.01	290	76	0.003	0.02	560
1,2-Dichloroethene (total)	0.03	870	750	0.026	11	greater than 100,000

Notes:

⁽¹⁾Existing Discharge Goals are based on the design flow rate of 8,000 cfm. Existing Discharge Goals were taken from the Final Operations and Maintenance Plan for GM-38 Area Groundwater Remediation from Tetra Tech EC. Existing goals were based on emission estimates for a 95% reduction, and not the previous DAR-1 Analysis. Attachment B (provided at the end of this package) provides the original emission estimates.

⁽²⁾Existing Discharge Goals were calculated using the actual flow rate of 9,200 cfm and the existing discharge loading rate in pounds per hour (lb/hr).

⁽³⁾Values were taken from the Quarterly Operations Report First Quarter 2011 from ECOR Federal Services. Values were the maximum effluent concentration in off gas from air stripper stack AS-1 prior to treatment with vapor phase granular activated carbon (GAC), for the months of January, February and March 2011.

⁽⁴⁾Actual VOC Loading was calculated using an average flow rate of 9,200 cfm and the January-March 2011 concentrations. Existing off gas treatment consists of two stage vapor phase GAC followed by potassium permanganate zeolite media to provide additional treatment for vinyl chloride.

⁽⁵⁾Values were calculated using an average flow rate of 9,200 cfm, and the Actual Annual % of the AGCs from the 2011 DAR-1 Model Output to achieve air quality requirements.

ATTACHMENT A
2008 AIR PERMIT SUBMITTAL

New York State Department of Environmental Conservation
Air Permit Application



DEC ID									
-									

Section III - Facility Information

Classification					
<input type="checkbox"/> Hospital	<input type="checkbox"/> Residential	<input type="checkbox"/> Educational/Institutional	<input type="checkbox"/> Commercial	<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Utility

Affected States (Title V Only) N/A					
<input type="checkbox"/> Vermont	<input type="checkbox"/> Massachusetts	<input type="checkbox"/> Rhode Island	<input type="checkbox"/> Pennsylvania	Tribal Land: _____	
<input type="checkbox"/> New Hampshire	<input type="checkbox"/> Connecticut	<input type="checkbox"/> New Jersey	<input type="checkbox"/> Ohio	Tribal Land: _____	

SIC Codes									
9999									

Facility Description		<input type="checkbox"/> Continuation Sheet(s)
Groundwater Remediation by Air Stripping followed by Vapor-Phase GAC for emission control		

Compliance Statements (Title V Only) N/A	
<p>I certify that as of the date of this application the facility is in compliance with all applicable requirements: <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>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 <u>in compliance</u> with all applicable requirements complete the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 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. <input type="checkbox"/> 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. <input type="checkbox"/> 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										<input type="checkbox"/> 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										<input type="checkbox"/> Continuation Sheet(s)
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause	

New York State Department of Environmental Conservation
Air Permit Application



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-									

Section IV - Emission Unit Information

Emission Unit Description										<input type="checkbox"/> Continuation Sheet(s)
EMISSION UNIT	0	-	0	0	E	U	1			
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					<input type="checkbox"/> Continuation Sheet(s)	
Building	Building Name			Length (ft)	Width (ft)	Orientation
BLDG-1	Treatment Plant			75	75	0

Emission Point							<input type="checkbox"/> Continuation Sheet(s)
EMISSION PT.	00ST1						
Ground Elev. (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section		
90	40	15	36	80	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	
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								<input type="checkbox"/> Continuation Sheet(s)
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.	
ID	Type				Code	Description		
AS-1	I				048	Granular Act. Carbon	Air Stripping Column	
Design Capacity	Design Capacity Units			Waste Feed		Waste Type		
	Code	Description		Code	Description	Code	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.	
ID	Type				Code	Description		
Design Capacity	Design Capacity Units			Waste Feed		Waste Type		
	Code	Description		Code	Description	Code	Description	

New York State Department of Environmental Conservation
Air Permit Application



DEC ID									
-									

Section IV - Emission Unit Information (continued)

Process Information										<input type="checkbox"/> Continuation Sheet(s)	
EMISSION UNIT 0 - 00 E U 1								PROCESS		PR 1	
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						
<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Operating at Maximum Capacity <input type="checkbox"/> 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						
<input type="checkbox"/> Confidential <input type="checkbox"/> Operating at Maximum Capacity <input type="checkbox"/> 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
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Section IV - Emission Unit Information (continued)

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements										<input type="checkbox"/> 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										<input type="checkbox"/> Continuation Sheet(s)	
				Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause		
-															
-															
-															
-															

Emission Unit Compliance Certification											<input type="checkbox"/> Continuation Sheet(s)
Rule Citation											
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause		
6	NYCRR	212									
<input checked="" type="checkbox"/> Applicable Federal Requirement				<input type="checkbox"/> State Only Requirement				<input type="checkbox"/> Capping			
Emission Unit	Emission Point	Process	Emission Source	CAS No.			Contaminant Name				
0-00EU1	00ST1	PR1	AS-1	00079 - 01 - 6			Trichloroethylene				
Monitoring Information											
<input type="checkbox"/> Continuous Emission Monitoring				<input type="checkbox"/> Monitoring of Process or Control Device Parameters as Surrogate							
<input checked="" type="checkbox"/> Intermittent Emission Testing				<input type="checkbox"/> Work Practice Involving Specific Operations							
<input type="checkbox"/> Ambient Air Monitoring				<input type="checkbox"/> 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		Process Material					Reference Test Method				
Type	Code	Description									
Parameter		Manufacturer Name/Model No.									
Code	Description										
23	Concentration										
Limit			Limit Units								
Upper	Lower	Code	Description								
3,125		255	micrograms per cubic meter								
Averaging Method			Monitoring Frequency			Reporting Requirements					
Code	Description		Code	Description		Code	Description				
01	Instantaneous		05	Monthly		10	Upon Request				

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

Determination of Non-Applicability (Title V Only) N/A <input type="checkbox"/> 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		<input type="checkbox"/> Applicable Federal Requirement <input type="checkbox"/> 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		<input type="checkbox"/> Applicable Federal Requirement <input type="checkbox"/> State Only Requirement			
Description										
Process Emissions Summary <input type="checkbox"/> Continuation Sheet(s)										
EMISSION UNIT	0 - 0 0 E U 1						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			Standard Units	PTE How Determined		Actual				
(lbs/hr)	(lbs/yr)	(standard units)				(lbs/hr)	(lbs/yr)			
0.09	99			02						
EMISSION UNIT	0 - 0 0 E U 1						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			Standard Units	PTE How Determined		Actual				
(lbs/hr)	(lbs/yr)	(standard units)				(lbs/hr)	(lbs/yr)			
0.01	3.7			02						
EMISSION UNIT	0 - 0 0 E U 1						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			Standard Units	PTE How Determined		Actual				
(lbs/hr)	(lbs/yr)	(standard units)				(lbs/hr)	(lbs/yr)			
0.03	7.3			02						

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

EMISSION UNIT		Emission Unit Emissions Summary				<input type="checkbox"/> Continuation Sheet(s)
0	-	0	0	E	U	1
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													<input type="checkbox"/> Continuation Sheet(s)
For any emission units which are <u>not in compliance</u> 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		

New York State Department of Environmental Conservation
Air Permit Application



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-									

Section IV - Emission Unit Information (continued)

Request for Emission Reduction Credits						<input type="checkbox"/> Continuation Sheet(s)			
EMISSION UNIT -									
Emission Reduction Description									
Contaminant Emission Reduction Data									
Baseline Period ____ / ____ / ____ to ____ / ____ / ____						Reduction			
						Date	Method		
						____ / ____ / ____			
CAS No.		Contaminant Name				ERC (lbs/yr)			
						Netting		Offset	
-									
-									
-									
Facility to Use Future Reduction									
Name						APPLICATION ID			
						- / - / - / - / - / - / - / - / - / -			
Location Address									
<input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village						State		Zip	

Use of Emission Reduction Credits						<input type="checkbox"/> Continuation Sheet(s)			
EMISSION UNIT -									
Proposed Project Description									
Contaminant Emissions Increase Data									
CAS No.		Contaminant Name				PEP (lbs/yr)			
-									
Statement of Compliance									
<input type="checkbox"/> 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									
<input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village						State		Zip	
Emission Unit	CAS No.	Contaminant Name			ERC (lbs/yr)				
					Netting		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 B

2008 EMISSION ESTIMATES BASED ON 95% REMOVAL

**ATTACHMENT 1
Emission Estimate**

POTENTIAL EMISSION ESTIMATES,
USED TO DEVELOP 95% REDUCTION
OF EMISSION VALUES AS BASED ON
INFLUENT GROUNDWATER CONCENTRATIONS
(95% REDUCTION OF EMISSIONS
VALUES ARE PROVIDED
ON PAGE 7 OF THE 2008 AIR
PERMIT APPLICATION PROCESS
EMISSIONS SUMMARY)

Feed Water Flow 1,100 gpm: max or normal
250 m³/hr
Water Flow including Recycle 1,200 gpm: max or normal
273 m³/hr
Air Flow 8,000 cfm
13,592 m³/hr
A/W vol ratio 50

EXAMPLE EMISSION CALC: Vinyl Chloride
4.8 ug/L x 1000 L/m³ x 250 m³ water/13,623 m³ air = 88 ug/m³

Name	CAS Number	Toxicity: H/M/L ²	VOC ³	HAP ⁴	GW Conc. ¹		Effluent Conc. ¹		Uncontrolled Stripper Exhaust							
					Max ug/L	Avg ug/L	Max ug/L	Avg ug/L	Max lb/day	Avg lb/day	Max lb/hr	Avg lb/hr	Max gm/sec	Avg gm/sec	Max ug/m ³	Avg 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 m³/hr
Water Flow Including Recycle 1,200 gpm: max or normal
273 m³/hr
Air Flow 8,000 cfm
13,592 m³/hr
A/W vol ratio 50

Controlled Stripper Exhat

Name	CAS Number	Toxicity: H/M/L ²	VOC ³	HAP ⁴	Control by	Max	Avg	Max	Avg
					GAC	lb/day	lb/day	gm/sec	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 C
2011 DISCHARGE GOALS AND 2011 DAR-1 ANALYSIS

Tetra Tech NUS		STANDARD CALCULATION SHEET	
CLIENT: US CLEAN	FILE No:	BY: SK	PAGE: 1 of 1
SUBJECT: Calculation of Current Discharge Goals GM-38 Area NWIRP Bethpage, New York		CHECKED BY:	DATE: 9/7/2011

1. Purpose:

To calculate current discharge goals for Trichloroethene (TCE), Tetrachloroethene (PCE), Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total), for treatment of off-gas from the air stripper stack AS-1.

2. Approach:

From the Contaminant Assessment Summary of the DAR-1 Model output for TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total) (see DAR-1 output for analysis inputs), use the Actual Annual % of the Annual Guideline Concentration (AGC), a current average flow rate of 9,200 cubic feet per minute (cfm), and influent chemical emission rates in pounds per hour (lb/hour) and pounds per year (lb/year) to back calculate current discharge goals.

3. Calculation of Current Discharge Goals:

Chemical	Current Actual Annual % of AGC ⁽¹⁾	Current Maximum Concentration (µg/m ³) ⁽²⁾	Current Chemical Emission Rate Prior to Treatment (lb/hour) ⁽³⁾	Current Chemical Emission Rate Prior to Treatment (lb/year) ⁽³⁾	Calculated Discharge Goal (lb/hr) ⁽⁴⁾	Calculated Discharge Goal (lb/year) ⁽⁴⁾	Maximum Allowable Concentration (µg/m ³) ⁽⁴⁾
TCE	390.6	10,000	0.3446	3,019	0.0882	770	2,600
PCE	132.8	6,800	0.2344	2,053	0.1764	1,500	5,100
Vinyl Chloride	13.49	76	0.0026	22.94	0.0194	170	560
cis 1,2-Dichloroethene	0.2322	750	0.0258	226.4	11.13	98,000	320,000
1,2-Dichloroethene (total)	0.2322	750	0.0258	226.4	11.13	98,000	320,000

Notes:

⁽¹⁾Actual Annual % of the AGCs is from the attached DAR-1 Model Output.

⁽²⁾Values were taken from the Quarterly Operations Report First Quarter 2011 (June 2011) from ECOR Federal Services. Values were the maximum effluent concentration in off gas from air stripper stack AS-1 for the months of January, February, and March 2011.

⁽³⁾Chemical Emission Rates were calculated from maximum concentrations and an average flow rate of 9,200 cfm.

⁽⁴⁾Discharge Goals are based on a flow of 9,200 cfm, and calculated from the Actual Annual % of the AGCs from the DAR-1 Model Output to achieve air quality requirements. The summary of additional inputs for this model run is provided in the DAR-1 Model Output. Stack height is 40 feet, and the property line was evaluated at a distance of 50 feet.

BETHPAGE SITE GM-38 OFF-SITE GROUNDWATER AIR STRIPPER STACK EMISSIONS
 DAR-1 MODEL OUTPUT, POINT SOURCE (STACK EMISSIONS) TYPE
 INCLUDES ISCLT MODELING SUMMARY

- I. Summary of Inputs for Model Run to Nearest Property Line (50 feet), worst case scenario (highest contaminant concentrations seen in first quarter 2011 in untreated effluent from Air Stripper AS-1 prior to treatment with granular activated carbon (GAC))

Chemical	CAS No. 00079-01-6 (TCE)	CAS No. 00127-18-4 (PCE)	CAS No. 00075-01-4 (Vinyl Chloride)	CAS No. 00156-59-2 (cis 1,2- Dichloroethene)	CAS No. 00540-59-0 (1,2- Dichloroethene, total)
Emission Rate Prior to Treatment ⁽¹⁾ (lb/hour)	0.3444	0.2342	0.0026	0.0258	0.0258
Emission Rate Prior to Treatment ⁽¹⁾ (lb/year)	3,017	2,052	22.93	226.0	226.0
Maximum Concentration of Untreated Off Gas ($\mu\text{g}/\text{m}^3$) ⁽¹⁾	10,000	6,800	76	750	750
Annual Guideline Concentration (AGC) ($\mu\text{g}/\text{m}^3$)	0.5	1.0	0.11	63	63
Short-term Guideline Concentration (SGC) ($\mu\text{g}/\text{m}^3$)	14,000	1,000	180,000	--	--

HA	Height Above stack/ maximum height of plume (HA, feet)	15
SH	Stack Height/Treatment Building Air Stack (SH, feet)	40
D	Stack Diameter (D, inches)	36
T	Stack Exit Temperature (T, degrees Fahrenheit)	80
V	Stack Exit Velocity (V, ft/sec)	21.69
Q ⁽²⁾	Stack Exit Flow Rate [Q, Actual Cubic Feet per Minute (ACFM)]	9,200
Dpl	Shortest Distance from Source Building (Treatment Building) to Property Line (Dpl, feet) for point sources	50
BW	Building Width (BW, feet) of Source Building (Treatment Building) for point sources	75
BL	Building Length (BL, feet) of Source Building (Treatment Building)	75
Q	Actual Hourly Emission Rate (lbs/hour) for source contaminant	Chemical specific, see above
Qa	Actual Annual Emission Rate (lbs/year) for source contaminant	Chemical specific, see above

⁽¹⁾ Emission rates and maximum concentration values were taken from the Quarterly Operations Report First Quarter (June 2011) as provided by ECOR Services, using January, February, and March 2011 maximum rates of untreated off gas from Air Stripper AS-1 in the

GM-38 Treatment Building. Emission rates are based on continuous operation 24 hours per day, 7 days a week, 52 weeks a year, or approximately 8,760 hours of operation.

⁽²⁾ "Q" is an average value of January and February 2011 monthly flow rates. Effective water and vapor flow rates were reduced during the reporting period of March due to a shutdown of the Treatment Plant on March 23, 2011.

II. Contaminant Assessment Summary of TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

CONTAMINANT ASSESSMENT SUMMARY OF DAR-1 ANALYSIS						9/ 8/11
						Page 1
CAS NUMBER	AGC ug/m3	SHORT-TERM	CAVITY	POINT or AREA SOURCE		
		MAXIMUM (Cav. Pt. Area) % OF SGC	ACTUAL ANNUAL % OF AGC	POTENTIAL ANNUAL % OF AGC	ACTUAL ANNUAL % OF AGC	
00075-01-4	0.11000000	0.0005	0.0000	13.3889	13.4948	
00079-01-6	0.50000000	0.7757	0.0000	390.1734	390.6266	
00127-18-4	1.00000000	7.3852	0.0000	132.6635	132.8415	
00156-59-2	63.00000000	0.0000	0.0000	0.2320	0.2322	
00540-59-0	63.00000000	0.0000	0.0000	0.2320	0.2322	
SUMMARY TOTALS		8.1614	0.0000	536.6897	537.4274	

III. Contaminant Impact Summary of TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

CONTAMINANT IMPACT SUMMARY OF DAR-1 ANALYSIS						9/ 8/11
						Page 1
CAS NUMBER	AGC ug/m3	SHORT-TERM	CAVITY	POINT or AREA SOURCE		
		MAXIMUM (Cav. Pt. Area) ug/m3	ACTUAL ANNUAL ug/m3	POTENTIAL ANNUAL ug/m3	ACTUAL ANNUAL ug/m3	
00075-01-4	0.11000000	0.81988204	0.00000000	0.01472780	0.01484433	
00079-01-6	0.50000000	108.60282900	0.00000000	1.95086694	1.95113296	
00127-18-4	1.00000000	73.85244750	0.00000000	1.32663476	1.32841504	
00156-59-2	63.00000000	8.13575172	0.00000000	0.14614509	0.14630693	
00540-59-0	63.00000000	8.13575172	0.00000000	0.14614509	0.14630693	

IV. Contaminant Impact Summary Step by Step Menu for TCE:

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*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00079-01-6          SIC = 0
AGC =          0.500000000 ug/m3          SGC =          14000.000000 ug/m3
STACK: HA= 15., SH= 40., D= 36., T= 80., U= 21.69, q= 9200.00
BUILDING: Dpl= 50., BW= 75., BL= 75., %CONTROL= 0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.344400000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          3017.000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 0.500 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 2.604 ug/m3 for 8760. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 2.601 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```


III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.B. STANDARD POINT SOURCE Actual Annual Impact < 1.953 ug/m3 > is greater than AGC < 0.500 ug/m3 >.

**** Refer to DAR-1 Section III.D.1. A refined site ****
**** specific modeling analysis may be required. ****

III.D. STANDARD POINT SOURCE Potential Annual Impact < 1.951 ug/m3 > is greater than AGC < 0.500 ug/m3 >.

**** Potential Annual Impact is based upon 8760 hours/year ****
**** operation instead of reported 8760. hours/year. ****

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.
See 'Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian,' 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume escaped the cavity region: $hs < 40. \text{ feet} > > hc < 26. \text{ feet} >$.

II.C. CAVITY Short-Term Impact < 0.000 ug/m3 > is less than SGC < 14000.000 ug/m3 >.

2.3 Momentum flux, F_m , is equal to 1000.331 ft(4)/sec(2).

2.3 Effective stack height, h_e , is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal to 38.826 ug/m3, for $hs/hb = 1.60$

2.5 Maximum downwash Short-Term Impact (CSTD) is equal to 129.908 ug/m3, for: $hs/hb = 1.60$ and $ESH = 51. \text{ feet}$.

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal to 108.603 ug/m3, for: $RF = 0.84$

III.D. Maximum non-cavity Short-Term Impact (CST: 108.603 ug/m3 > is less than the SGC < 14000.000 ug/m3 > for the point source.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 108.603 ug/m3 and is reported in the ANALYSIS MENU. This value is less than the SGC < 14000.000 ug/m3 >.

V. Contaminant Impact Summary Step by Step Menu for PCE:

```

*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, MEV
EMISSION POINT =          TOTAL          CAS NUMBER = 00127-18-4          SIC = 0
AGC =          1.000000000 ug/m3          SGC =          1000.000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., T=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate (Q) is equal to          0.234200000 lbs/hour.
** Reported Annual Emission Rate (Qa) is equal to          2052.000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD (DAR-1, APPENDIX B).
II.B.1. Shortest Distance from building to Property Line ( 50. feet )
is less than or equal to the cavity length, or 3 building
heights ( 75. feet ). Therefore, this building will have
cavity impacts (if they occur) at receptors off plant property.
II.B.2. The largest building dimension ( 75. feet ) is greater than or
equal to the building height ( 25. feet ). Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height ( 40. feet ) is greater than cavity height
( 38. feet ). Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact ( 0.000 ug/m3 ) is less than AGC
( 1.000 ug/m3 ).
III.A. STANDARD POINT SOURCE METHOD (DAR-1, APPENDIX B).
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 1.771 ug/m3 for 8762. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 1.769 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```


III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact (1.328 ug/m3) is greater than AGC (1.000 ug/m3).

**** Refer to DAR-1 Section III.D.1. A refined site specific modeling analysis may be required. ****

III.D. STANDARD POINT SOURCE Potential Annual Impact (1.327 ug/m3) is greater than AGC (1.000 ug/m3).

**** Potential Annual Impact is based upon 8760 hours/year operation instead of reported 8762. hours/year. ****

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD. See "Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian," 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 8.00 ug/m3 as the plume escaped the cavity region: $h_c(40. \text{ feet}) > h_c(26. \text{ feet})$.

II.C. CAVITY Short-Term Impact (0.000 ug/m3) is less than SGC (1000.000 ug/m3).

2.3 Momentum Flux, F_m , is equal to 1000.331 ft⁴/sec².

2.3 Effective stack height, h_e , is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal to 26.403 ug/m3, for $h_c/h_b = 1.60$

2.5 Maximum downwash Short-Term Impact (CSTD) is equal to 88.340 ug/m3, for: $h_c/h_b = 1.60$ and ESH = 51. feet.

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal to 73.852 ug/m3, for: RF = 0.84

III.D. Maximum non-cavity Short-Term Impact (CST: 73.852 ug/m3) is less than the SGC (1000.000 ug/m3) for the point source.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 73.852 ug/m3 and is reported in the ANALYSIS MENU. This value is less than the SGC (1000.000 ug/m3).

VI. Contaminant Impact Summary Step by Step Menu for Vinyl Chloride:

```

*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00075-01-4          SIC = 0
AGC =          0.110000000 ug/m3          SGC =          180000.000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., I=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.002600000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          22.930000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 0.110 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 0.020 ug/m3 for 8819. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 0.020 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```


III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact < 0.015 ug/m3 > is less than AGC < 0.110 ug/m3 >.

III.D. STANDARD POINT SOURCE Potential Annual Impact < 0.015 ug/m3 > is less than AGC < 0.110 ug/m3 >.

**** Potential Annual Impact is based upon 8760 hours/year ****
**** operation instead of reported 8819. hours/year. ****

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.
See "Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian," 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume escaped the cavity region: hs< 40. feet > hc< 26. feet >.

II.C. CAVITY Short-Term Impact < 0.000 ug/m3 > is less than SGC < 180000.000 ug/m3 >.

2.3 Momentum flux, F_m , is equal to 1000.331 ft<4>/sec<2>.

2.3 Effective stack height, h_e , is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal to 0.293 ug/m3, for $h_s/h_b = 1.60$

2.5 Maximum downwash Short-Term Impact (CSTD) is equal to 0.981 ug/m3, for: $h_s/h_b = 1.60$ and $ESH = 51. feet.$

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal to 0.820 ug/m3, for: $RF = 0.84$

III.D. Maximum non-cavity Short-Term Impact (CST: 0.820 ug/m3 > is less than the SGC < 180000.000 ug/m3 > for the point source.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 0.820 ug/m3 and is reported in the ANALYSIS MENU. This value is less than the SGC < 180000.000 ug/m3 >.

VII. Contaminant Impact Summary Step by Step Menu for cis 1,2-Dichloroethene:

```

*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00156-59-2          SIC = 0
AGC =          63.000000000 ug/m3          SGC =          0.000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., I=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.025800000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          226.000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 63.000 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Fm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 0.195 ug/m3 for 8760. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 0.195 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.

```


III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact < 0.146 ug/m3 > is less than AGC < 63.000 ug/m3 >.

III.D. STANDARD POINT SOURCE Potential Annual Impact < 0.146 ug/m3 > is less than AGC < 63.000 ug/m3 >.

**** Potential Annual Impact is based upon 8760 hours/year ****
 **** operation instead of reported 8760. hours/year. ****

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.
 See 'Technical Reference for the Screening Procedures of the DAR-1 Software Program, Wade/Sedefian,' 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume escaped the cavity region: hs(40. feet) > hc(26. feet).

II.C. CAVITY Short-Term Impact is equal to 0.000 ug/m3.
 There is no SGC for this contaminant.

2.3 Momentum flux, Fm, is equal to 1000.331 ft(4)/sec(2).

2.3 Effective stack height, he, is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal to 2.909 ug/m3, for hs/hb = 1.60

2.5 Maximum downwash Short-Term Impact (CSTD) is equal to 9.732 ug/m3, for: hs/hb = 1.60 and ESH = 51. feet.

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal to 8.136 ug/m3, for: RF = 0.84

III.D. Maximum non-cavity Short-Term Impact (CST) equals 8.136 ug/m3 for the point source. There is no SGC for this contaminant.

2.7 Maximum Short-Term cavity, point, or area source impact (SHORT-TERM MAXIMUM, (Cav,Pt,Area)) equals 8.136 ug/m3 and is reported in the ANALYSIS MENU.

VIII. Contaminant Impact Summary Step by Step Menu for 1,2-Dichloroethene (total):

```
*****
NWIRP BETHPAGE GM-38 AREA          BETHPAGE          OYSTER BAY, NEW
EMISSION POINT =          TOTAL          CAS NUMBER = 00540-59-0          SIC = 0
AGC =          63.000000000 ug/m3          SGC =          0.000000 ug/m3
STACK: HA=          15., SH=          40., D=          36., T=          80., U=          21.69, q=          9200.00
BUILDING: Dpl=          50., BW=          75., BL=          75., %CONTROL=          0.0000
** Reported Hourly Emission Rate <Q> is equal to          0.025800000 lbs/hour.
** Reported Annual Emission Rate <Qa> is equal to          226.000000 lbs/year.
II.B. REFINED CAVITY IMPACT METHOD <DAR-1, APPENDIX B>.
II.B.1. Shortest Distance from building to Property Line < 50. feet >
is less than or equal to the cavity length, or 3 building
heights < 75. feet >. Therefore, this building will have
cavity impacts <if they occur> at receptors off plant property.
II.B.2. The largest building dimension < 75. feet > is greater than or
equal to the building height < 25. feet >. Therefore, the
computer will NOT redefine the cavity length.
II.B.3. Stack height < 40. feet > is greater than cavity height
< 38. feet >. Therefore, this source does not contribute to
the buildings cavity impact. The Computer will assume the
CAVITY Annual Impact equals 0.00 ug/m3.
II.C. CAVITY Annual Impact < 0.000 ug/m3 > is less than AGC
< 63.000 ug/m3 >.
III.A. STANDARD POINT SOURCE METHOD <DAR-1, APPENDIX B>.
III.A.1.b. Momentum flux, Pm, is equal to 1000.331 ft<4>/sec<2>.
III.A.1.b. Effective stack height, he, is equal to 51.001 feet.
III.A.2. STANDARD POINT SOURCE Actual Annual Impact is equal
to 0.195 ug/m3 for 8760. hours/year of operation.
III.A.3. STANDARD POINT SOURCE Potential Annual Impact is equal
to 0.195 ug/m3 assuming 8,760 hours/year of operation.
III.A.4.a. Stack height to building height ratio is greater than
1.5, but less than 2.5. Computer will multiply actual
annual & potential annual impacts by 0.75 factor.
```



```

III.A.5. STANDARD POINT SOURCE Short-Term Impact is calculated below
         using the DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.

III.D. STANDARD POINT SOURCE Actual Annual Impact < 0.146 ug/m3 > is
         less than AGC < 63.000 ug/m3 >.

III.D. STANDARD POINT SOURCE Potential Annual Impact < 0.146 ug/m3 >
         is less than AGC < 63.000 ug/m3 >.

**** Potential Annual Impact is based upon 8760 hours/year ****
**** operation instead of reported 8760. hours/year. ****

2.0 DAR-1 SOFTWARE PROGRAM SHORT-TERM METHOD.
    See "Technical Reference for the Screening Procedures of the
    DAR-1 Software Program, Wade/Sedefian," 1/11/94.

2.2 CAVITY Short-Term Impact is equal to 0.00 ug/m3 as the plume
     escaped the cavity region: hs< 40. feet > hc< 26. feet >.

II.C. CAVITY Short-Term Impact is equal to 0.000 ug/m3.
       There is no SGC for this contaminant.

2.3 Momentum flux, Fm, is equal to 1000.331 ft(4)/sec(2).

2.3 Effective stack height, he, is equal to 51.001 feet.

2.4 Maximum non-downwash GEP stack Short-Term Impact (CSTP) is equal
     to 2.909 ug/m3, for hs/hb = 1.60

2.5 Maximum downwash Short-Term Impact (CSTD) is equal
     to 9.732 ug/m3, for: hs/hb = 1.60 and ESH = 51. feet.

2.6 Adjusted maximum downwash Short-Term (CSTD) is equal
     to 8.136 ug/m3, for: RF = 0.84

III.D. Maximum non-cavity Short-Term Impact (CST) equals 8.136 ug/m3
       for the point source. There is no SGC for this contaminant.

2.7 Maximum Short-Term cavity, point, or area source impact
     (SHORT-TERM MAXIMUM, <Cav.Pt.Area>) equals 8.136 ug/m3
     and is reported in the ANALYSIS MENU.

```

IX. AGCs and SGCs for TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

AGCs & SGCs				9/ 8/11	
				Page 1	
CAS NUMBER	CONTAMINANT NAME	SGC ug/m3	II O V	AGC ug/m3	II I O O V X CODES
00075-01-4	VINYL CHLORIDE	18000.00000	D	0.110000000	E H U HA
00079-01-6	TRICHLOROETHYLENE	14000.00000	Z	0.500000000	D M O HA
00127-10-4	TETRACHLOROETHYLENE	1000.00000	H	1.000000000	H M O HA
00156-59-2	DICHLOROETHYLENE, cis	0.00000		63.000000000	D M
00540-59-0	DICHLOROETHYLENE, 12	0.00000		63.000000000	D M

X. Contaminant Emissions Summary for TCE, PCE, Vinyl Chloride, cis 1,2-Dichloroethene, and 1,2-Dichloroethene (total):

CONTAMINANT EMISSIONS SUMMARY				9/ 8/11
				Page 1
CAS NUMBER	CONTAMINANT NAME	NUM. OF EPs PER CONTAM.	EMISSIONS (lbs/hour)	EMISSIONS (lbs/year)
00075-01-4	VINYL CHLORIDE	1	0.0026000	22.93000
00079-01-6	TRICHLOROETHYLENE	1	0.3444000	3017.00000
00127-10-4	TETRACHLOROETHYLENE	1	0.2342000	2052.00000
00156-59-2	DICHLOROETHYLENE, cis	1	0.0258000	226.00000
00540-59-0	DICHLOROETHYLENE, 12	1	0.0258000	226.00000
SUMMARY TOTALS		5	0.6328000	5543.93000

XI. Meter Grid Modeling Results for Maximum Annual Concentrations of TCE, within 25 meters:

CONCENTRATIONS x 10 ⁻² (ug/m3) for 00079-01-6													09/08/11
AGC =													13:17:58
TIME	367000.	368000.	369000.	370000.	371000.	372000.	373000.	374000.	375000.	376000.	377000.	378000.	
4511000.	0.04	0.06	0.08	0.14	0.23	0.32	0.41	0.30	0.14	0.10	0.08	0.06	0.05
4510000.	0.03	0.05	0.08	0.13	0.25	0.43	0.60	0.40	0.17	0.12	0.09	0.07	0.06
4509000.	0.02	0.03	0.06	0.11	0.24	0.58	1.01	0.52	0.22	0.14	0.11	0.08	0.06
4508000.	0.02	0.03	0.04	0.06	0.18	0.62	2.16	0.64	0.31	0.19	0.13	0.11	0.09
4507000.	0.02	0.03	0.04	0.06	0.11	0.26	7.27	1.43	0.60	0.34	0.22	0.15	0.12
4506000.	0.03	0.03	0.05	0.07	0.13	0.33	2.58	2.99	1.12	0.51	0.30	0.20	0.14
4505000.	0.03	0.04	0.05	0.08	0.20	0.45	0.94	0.81	0.60	0.45	0.33	0.23	0.16
4504000.	0.03	0.04	0.07	0.12	0.20	0.22	0.47	0.43	0.33	0.27	0.24	0.20	0.16

TOP 100 CONTRIBUTORS TO MAXIMUM CONCENTRATION FOR 00079-01-6							09/08/11
@ TIME: 373000. UTMN: 4507000.							13:17:58
Emission Point	Facility Name (shortened)	EP DIR	Distance to Max.(m)	CONC. ug/m3	Percent of Max.		
TOTAL	NWIRP BETHPAGE GM-38 AREA	SSE	539.	0.727E-01	100.000		
TOTAL OF ALL	1 CONTRIBUTORS					0.727E-01	100.000

XII. ISCLT Model Run Information, within 25 meters:

```

                                MODEL RUN INFORMATION
                                09/08/11
                                13:17:58

1. Current GRID SPACING equals 1000. meters.
2. Maximum Concentration (flashing) equals 0.0727115273 ug/m3
   @ UTME: 373000. UTMN: 4507000.

3. RUN FILE: TEMP?.RUN
4. METEOROLOGICAL FILE: ALB.MET
5. RUN MODE: URBAN
6. HALF-LIVES: not used to account for pollutant removal from air.
7. BLD. WAKE EFFECTS: AS-1 METHOD, All data KNOWN (hb, hv, hl, orientation)
8. EMISSIONS: ACTUAL ANNUAL EMISSIONS
9. SOURCES: All sources within 25. meters of
   UTME: 373275. UTMN: 4506537.
10. CONTAMINANT CAS NUMBER(s): 00079-01-6
11. EMISSION POINT - CONTAMINANT(s) found by computer: 1
12. No data is being copied to DUMP file.
```

APPENDIX C

**FIELD LOGS AND
CHAIN OF CUSTODY DOCUMENTATION**

Date: March 2019



Groundwater Level Measurement Sheet

Project Site: NWIPR Bethpage – GM-38

Water Level Meter: Solinst

Location: Bethpage, NY

Weather: _____

Field Crew: Seiler + Hoffmaster

Time of Low Tide: N/A

Time of High Tide: N/A

Well ID	Time	Depth to Water (Ft.)	Total Depth of Well/ Screened Interval (Ft.)	Comments
RW1-MW1	1020 1120	39.74 33.60	435 / 395 – 435	
RW1-MW2	1015	36.18	435 / 395 – 435	
RW1-MW3	1340	26.68	435 / 395 – 435	
RW2-MW1	1215	37.00	510 / 470 – 510	
RW2-MW2	1430	35.17	510 / 470 – 510	
RW2-MW3	1435	36.10	510 / 470 – 510	
RW3-MW1	1615	35.50	350 / 330 – 350	
RW3-MW2	1515	37.02	495 / 475 – 495	
RW3-MW3	1450	36.80	340 / 320 – 340	
RW3-MW4	1115	38.10	495 / 475 – 495	
TP1	1100	31.64	470 / 450 – 470	
IW1-MW1	1020	39.74	470 / 450 – 470	
RW-1	—	—		Open vault and check integrity of piping, etc.
RW-3	—	—		Open vault and check integrity of piping, etc.

Signature: Erich Seiler

Date: 3/8/2019

Koman Government Solutions, LLC

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM38
 Location: Bethpage, NY
 Well ID: RW 3 - MW 4

Date: 03/5/2019
 Sampler: Seiler
 PID: -----



Start Time: _____ End Time: _____
 Well Construction: 4" PVC Flushment
 Depth to Water: 38.10
 Well Depth: _____
 Water Column: _____
 Total Volume Removed (L): _____
 Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556 MPS	08A100740
LaMotte	2020e	9072-1817
Marschalk Bladder Pump	24"	73814

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)	Salinity (ppm)	Color
11:27	—	400	38.16	13.12	4.86	108	1.36	148.8	1.15		clear
11:32		400	38.17	11.97	4.58	107	0.68	147.8	1.39		clear
11:37		300	38.18	11.75	4.55	110	0.61	213.7	1.27		clear
11:42		300	38.20	10.85	4.55	116	0.58	221.5	1.42		clear
11:47		300	38.21	12.50	4.48	129	0.66	237.9	2.00		clear
* 11:52		300	38.23	12.15	4.47	136	0.62	242.7	—		clear
12:15		400	38.23	11.22	4.28	139	0.78	265.4	1.63		clear
12:20		400	38.24	12.88	4.50	142	0.78	258.2	1.41		clear
12:25		400	38.25	12.44	4.47	142	0.68	257.6	1.56		clear

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

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
12:30	GM-38-GW-RW 3-MW4-0319				
		40 mL CG	3	HCl	TCL VOCs (624) 8260
		500 mL PL	1	HNO ₃	Hg (245.1)
		250 mL PL	1	---	TSS (SM2540D)

Comments

* water in air line, froze and could not pump

Erin Seiler
 Signature

3/8/2019
 Date

Koman Government Solutions, LLC

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM38
 Location: Bethpage, NY
 Well ID: RW3-MW3

Date: 03/5/2019
 Sampler: Seiler
 PID: -----



Start Time: _____ End Time: _____
 Well Construction: 4" PVC
 Depth to Water: 36.80
 Well Depth: _____
 Water Column: _____
 Total Volume Removed (L): 2.02
 Dedicated Pump in Well?: NO

Field Testing Equipment

Make	Model	Serial #
YSI	556 MPS	08A100740
LaMotte	2020e	9072-1817
Marschalk Bladder Pump	24"	15179

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)	Salinity (ppm)	Color
1305	—	400	36.85	12.64	4.87	101	4.01	225.4	5.36	X	clear
1310		400	36.90	13.68	4.85	102	1.48	224.1	15.3		clear *
1315		400	36.91	13.84	4.85	103	1.37	224.0	13.9		clear *
1320		400	36.92	13.33	4.82	103	1.45	226.0	6.67		clear *
1325		400	36.92	13.63	4.81	103	1.51	231.1	7.34		clear *
1330		400	36.95	13.67	4.79	103	1.46	231.1	6.72		clear *

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

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1400	GM-38-GW-RW3-MW3-0319	40 mL CG	29	HCl	TCL VOCs (624) 8260
		500 mL PL	13	HNO ₃	Hg (245.1)
		¹⁰⁰⁰ 250 mL PL	13	---	TSS (SM2540D)
1415	GM-38-GW-RW3-MW3-DUP-0319				

Comments

*clear w/ some iron deposits

Eric Seiler

Signature

3/8/2019

Date

Koman Government Solutions, LLC

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM38
 Location: Bethpage, NY
 Well ID: RW3 - MW2

Date: 03/5/2019
 Sampler: Seiler
 PID: -----



Start Time: _____ End Time: _____
 Well Construction: _____
 Depth to Water: 37.02
 Well Depth: _____
 Water Column: _____
 Total Volume Removed (L): 1.75 L
 Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556 MPS	08A100740
LaMotte	2020e	9072-1817
Marschalk Bladder Pump	24"	15179

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)	Salinity (ppm)	Color
1520	—	250	37.56	9.43	4.62	80	9.20	256.3	1.63	XXXX	Clear
1531		250	37.51	11.77	4.63	81	3.19	252.3	1.22		Clear
1536		250	37.52	11.96	4.64	80	2.57	251.6	1.24		Clear
1541		250	37.55	12.07	4.66	77	2.09	250.9	1.38		Clear
1546		250	37.55	12.21	4.67	76	1.78	250.3	1.36		Clear
1551		250	37.56	12.22	4.67	76	1.57	249.3	1.06		Clear
1556		250	37.57	12.24	4.66	76	1.45	248.3	1.25		Clear
1601		250	37.58	12.30	4.65	76	1.32	247.9	1.18		Clear

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

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1605	GM-38-GW-RW3-MW2-0319				
		40 mL CG	3	HCl	TCL VOCs (624) 8260
		500 mL PL	1	HNO ₃	Hg (245.1)
		250 mL PL	1	---	TSS (SM2540D)

Comments

Ernie Seiler

Signature

3/8/2019

Date

Koman Government Solutions, LLC

Low Flow/ Low Stress Groundwater Sampling Log

Project: NWIRP Bethpage - GM38
 Location: Bethpage, NY
 Well ID: RW2 - MW1

Date: 03/17/2019
 Sampler: Seiler
 PID: -----



Start Time: _____ End Time: _____
 Well Construction: _____
 Depth to Water: 37.03
 Well Depth: _____
 Water Column: _____
 Total Volume Removed (L): 4.9 L
 Dedicated Pump in Well?: No

Field Testing Equipment

Make	Model	Serial #
YSI	556 MPS	08A100740
LaMotte	2020e	9072-1817
Marschalk Bladder Pump	24"	9987

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)	Salinity (ppm)	Color
1230	—	300	37.02	12.75	7.55	134	1.69	209.3	6.47		Clear
1235		300	37.03	12.76	8.31	134	0.40	175.7	6.69		Clear
1240		300	37.05	12.61	8.40	134	0.22	158.9	5.77		Clear
1245		300	37.06	12.61	7.93	133	0.27	37.9	4.98		Clear
1250		200	37.07	13.08	5.96	170	0.26	31.4	6.02		Clear
1255		200	37.08	13.39	5.77	179	0.25	49.1	5.08		Clear
1300		200	37.10	13.21	5.82	179	0.25	39.8	5.24		Clear

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

2" Screen Volume = 0.163 gal/ft or 616 ml per foot

Sample Collection

Time	Sample ID	Container	# Bottles	Preservative	Analysis
1305	GM-38-GW-RW2-MW1-0319				
		40 mL CG	3	HCl	TCL VOCs (624) 8260
		500 mL PL	1	HNO ₃	Hg (245.1)
		250 mL PL	1	---	TSS (SM2540D)

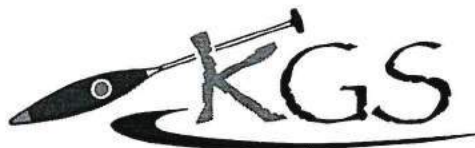
Comments

Eric Seiler

Signature

3/18/2019

Date



Instrument Calibration Log

Project/Site Name: Bethpage Gm38

Date: 3/5/2019

Weather: Sunny, clear,

Calibrated By: Seiler

Instrument: YSI 556 MPS

Serial Number: 08A100740

Parameters	Morning Calibration Time: <u>1005</u>	Cal. Temperature °C	Afternoon Cal. Check Time: _____	Comments
Conductivity ($\mu\text{S}/\text{cm}$)	<u>1.697 → 1.413</u>	<u>11.88</u>		
pH (7)	<u>6.84 → 6.99</u>	<u>11.53</u>		
pH (4)	<u>4.15 → 3.98</u>	<u>11.99</u>		
pH (10)	<u>10.12 → 10.03</u>	<u>11.80</u>		
ORP (mV)	<u>263.1 → 240.0</u>	<u>12.89</u>		
Dissolved Oxygen (%)	<u>102.0% → 100.0%</u>	<u>12.16</u>		
Zero Dissolved Oxygen (mg/L)				
Barometric Pressure (mm Hg)				

Signature: _____

Erich Seiler

Date: _____

3/5/2019



Instrument Calibration Log

Project/Site Name: Bethpage GM38

Date: 3/6/2019

Weather: _____

Calibrated By: Seiler

Instrument: YSI 556mPS

Serial Number: 08A100740

Parameters	Morning Calibration	Cal. Temperature °C	Afternoon Cal. Check	Comments
	Time: <u>0708</u>		Time: _____	
Conductivity (µS/cm)	1.426 → 1.413	17.83		
pH (7)	6.97 → 7.00	17.87		
pH (4)	3.96 → 4.00	17.75		
pH (10)	9.96 → 9.99	17.83		
ORP (mV)	229.4 → 240.0	18.07		
Dissolved Oxygen (%)	104.3% → 100.0%	18.49		
Zero Dissolved Oxygen (mg/L)				
Barometric Pressure (mm Hg)				

Signature:

Date: 3/6/2019



Instrument Calibration Log

Project/Site Name: Bethpage GM38

Date: 3/7/2019

Weather: _____

Calibrated By: Seiler

Instrument: YSI 556 MPS

Serial Number: 084100740

Parameters	Morning Calibration	Cal. Temperature °C	Afternoon Cal. Check	Comments
	Time: <u>0925</u>		Time: _____	
Conductivity (μ S/cm)	1.367 \rightarrow 1.413	17.50		
pH (7)	6.87 \rightarrow 7.03	17.69		
pH (4)	4.23 \rightarrow 4.01	17.77		
pH (10)	10.22 \rightarrow 10.03	17.57		
ORP (mV)	238.0 \rightarrow 246.0	17.79		
Dissolved Oxygen (%)	105.9% \rightarrow 100.0%			
Zero Dissolved Oxygen (mg/L)				
Barometric Pressure (mm Hg)				

Signature: Erich Seiler

Date: 3/7/2019



Instrument Calibration Log

Project/Site Name: Bethpage GM38

Calibrated By: Seiler

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: <u>3/5/2019</u>
LaMotte 2020e / 9072-1817	1.43		9.36			1.11	10.00		Time: 1005 &
9072-1817	0.74		10.04			1.00	9.99		Time: 0720 &
9072-1817	0.82		9.35			0.99	10.00		Time: 0925 &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &
									Time: &

Signature: Erich Seiler

Date: 3/6/2019 + 3/7/2019

APPENDIX D

DATA VALIDATION REPORTS

VOLATILE ORGANIC COMPOUNDS
USEPA Region II –Data Validation

Project Name: Naval Weapons Industrial Reserve Plant, GM-38 Area-LTM
Location: 100 Broadway, Bethpage, NY
SDG #: R1902053
Client: KOMAN Government Solutions, LLC
Date: 04/24/2019
Laboratory: ALS Environmental, Middletown, PA
Reviewer: Sherri Pullar

Summary:

1. Data validation was performed on the data for nine (9) water samples, two (2) trip blanks and one (1) equipment blank analyzed for Volatiles by EPA Method 624.1.
2. The samples were collected on 3/05 thru 3/07/2019. The samples were submitted to ALS Environmental, Middletown, PA on 3/08/2019 for analysis.
3. The USEPA Region II SOP HW-34, Revision No.: 3, Trace Volatile Data Validation; USEPA National Functional Guidelines for Organic Data Review, EPA 540/R-2017-002, January 2017; EPA Method 624 and Quality Assurance Project Plan for GM-38 Area, Naval Weapons Industrial Reserve Plant, Bethpage, NY; September 3, 2009 were used in evaluating the Volatiles data in this summary report.
4. In general, the data are valid as reported and may be used for decision making purposes. Selected data points were qualified due to nonconformance of certain Quality Control criteria (See discussion below).

Samples:

The samples included in this review are listed below:

Client Sample ID	Laboratory Sample ID	Collection Date	Matrix	Sample Status
GM-38-GW-RW3-MW4-0319	R1902053-001	3/05/2019	Water	
GM-38-GW-RW3-MW3-0319	R1902053-002	3/05/2019	Water	
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	3/05/2019	Water	Field Duplicate of sample GM-38-GW-RW3-MW3-0319
GM-38-GW-RW3-MW2-0319	R1902053-004	3/05/2019	Water	
GM-38-GW-RW3-MW1-0319	R1902053-005	3/05/2019	Water	
GM-38-GW-TP1-0319	R1902053-006	3/06/2019	Water	
GM-38-EB-0319	R1902053-007	3/06/2019	Water	Equipment Blank
GM-38-TB01-0319	R1902053-008	3/05/2019	Water	Trip Blank
GM-38-TB2-0319	R1902053-009	3/05/2019	Water	Trip Blank
GM-38-GW-RW1-MW1-0319	R1902053-010	3/07/2019	Water	
GM-38-GW-RW2-MW1-0319	R1902053-011	3/07/2019	Water	
GM-38-GW-RW1-MW3-0319	R1902053-012	3/07/2019	Water	

Sample Conditions/Problems:

1. The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data. No qualifications were required.

Holding Times:

1. All water samples were analyzed within 14 days from sample collection. No qualifications were required.
2. All water samples were properly preserved (pH<2.0). No qualifications were required.



GC/MS Tuning:

1. All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria. No qualifications were required.

Initial Calibration:

1. Initial calibration curve analyzed on 3/15/2019 (R-MS-12) exhibited acceptable %RSD and average RRF values for all compounds. No qualifications were required.
2. Initial calibration curve analyzed on 3/12/2019 (R-MS-10) exhibited acceptable %RSD and average RRF values for all compounds. No qualifications were required.

Continuing Calibration Verification (CCV):

1. CCV analyzed (R-MS-12) exhibited acceptable %Ds ($\leq 20.0\%$) for all compounds. No qualifications were required.
2. CCV analyzed (R-MS-10) exhibited acceptable %Ds ($\leq 20.0\%$) for all compounds. No qualifications were required.

Surrogates:

1. All surrogates %REC values for all water samples and associated QC were within the laboratory control limits. No qualifications were required.

Internal Standard (IS) Area Performance:

1. All samples exhibited acceptable area count for all three internal standards. No qualifications were required.

Method Blank (MB), Storage Blank (SB), Trip Blank (TB), Field Blank (FB), Rinsate Blank (RB) and Equipment Blank (EB):

1. Method Blank (RQ1902312-03) analyzed on 3/15/2019 contained tetrachloroethene (0.267 $\mu\text{g/L}$).

Results for tetrachloroethene were qualified as non-detect (U, reported to the LOD) in samples GM-38-GW-RW3-MW3-0319, GM-38-GW-RW3-MW3-DUP-0319, GM-38-GW-RW3-MW2-0319, and GM-38-GW-RW1-MW1-0319 and non-detect (U) in sample GM-38-GW-RW3-MW1-0319.
2. Method Blank (RQ1902319-04) analyzed on 3/18/2019 was free of contamination. No qualifications were required.

3. Method Blank (RQ1902079-05) analyzed on 3/12/2019 was free of contamination. No qualifications were required.
4. Equipment Blank (GM-38-EB-0319) (R1902053-007) analyzed on 3/18/2019 was free of contamination. No qualifications were required.
5. Trip Blank (GM-38-TB01-0319) (R1902053-008) analyzed on 3/12/2019 was free of contamination. No qualifications were required.
6. Trip Blank (GM-38-TB02-0319) (R1902053-009) analyzed on 3/12/2019 was free of contamination. No qualifications were required.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD):

1. Laboratory Control Sample (RQ1902312-02) was analyzed on 03/15/2019. All %RECs were within the laboratory control limits. No qualifications were required.
2. Laboratory Control Sample (RQ1902319-03) was analyzed on 03/18/2019. All %RECs were within the laboratory control limits. No qualifications were required.
3. Laboratory Control Sample (RQ1902079-04) was analyzed on 03/12/2019. All %RECs were within the laboratory control limits. No qualifications were required.

Field Duplicate:

1. Sample GM-38-GW-RW3-MW3-DUP-0319 (R1902053-003) was collected as field duplicate for sample GM-38-GW-RW3-MW3-0319 (R1902053-002). All RPDs were ≤50.0%. No qualifications were required.

Field Sample	Compound	Analytical Method	Result	Units	Field Duplicate	Result	Units	RPD	Qualifier
GM-38-GW-RW3-MW3-0319	1,1,1-Trichloroethane	EPA 624	0.594	µg/l	GM-38-GW-RW3-MW3-DUP-0319	0.599	µg/l	0.8	None
GM-38-GW-RW3-MW3-0319	1,1-Dichloroethane	EPA 624	2.21	µg/l	GM-38-GW-RW3-MW3-DUP-0319	1.97	µg/l	11.5	None
GM-38-GW-RW3-MW3-0319	1,1-Dichloroethene	EPA 624	1.17	µg/l	GM-38-GW-RW3-MW3-DUP-0319	1.14	µg/l	2.6	None
GM-38-GW-RW3-MW3-0319	Chloroform	EPA 624	0.42	µg/l	GM-38-GW-RW3-MW3-DUP-0319	0.37	µg/l	12.7	None
GM-38-GW-RW3-MW3-0319	Cis-1,2-Dichloroethene	EPA 624	0.840	µg/l	GM-38-GW-RW3-MW3-DUP-0319	0.805	µg/l	4.3	None
GM-38-GW-RW3-MW3-0319	Trichloroethene	EPA 624	151	µg/l	GM-38-GW-RW3-MW3-DUP-0319	147	µg/l	2.7	None

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

1. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were performed on sample GM-38-GW-RW3-MW3-0319 (R1902053-002). All %RECs and RPDs were within the laboratory control limits. No qualifications were required.

Compound Quantitation and Reported Contract Required Quantitation Limits (CRQLs):

1. All results were within the linear calibration range. No qualifications were required.

Target Compound Identification:

1. All Relative Retention Times (RRTs) of the reported compounds were within ± 0.06 RRT units of the standard (opening CCV).
2. Sample compound spectra were compared against the laboratory standard spectra.
3. No QC deviations were observed.

Comments:

1. Validation qualifiers (if required) were entered into the EDD for SDG: R1902053.
2. Summary of the qualified data is listed in the Qualification Summary Table for SDG: R1902053 at the end of the data validation report.

**NWIRP BETHPAGE GM-38
MARCH 2019 EVENT
QUALIFICATION SUMMARY TABLE
AQUEOUS
SDG: R1902053
VOC**

Sample Name	Lab ID	Analytical Method	Analyte	Unit	Reported Result	Lab Qualifier	Validated Value	DV Qualifier	Reason Code
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	Tetrachloroethene (PCE)	UG_L	0.538	BJ	1.00	U	MB
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	Tetrachloroethene (PCE)	UG_L	0.592	BJ	1.00	U	MB
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	Tetrachloroethene (PCE)	UG_L	0.328	BJ	1.00	U	MB
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	Tetrachloroethene (PCE)	UG_L	1.72	BJ	1.72	U	MB
GM-38-RW1-MW1-0319	R1902053-010	624.1	Tetrachloroethene (PCE)	UG_L	0.323	BJ	1.00	U	MB

NOTE: Only results that had qualifications added after validation are listed in this table.

Reason Codes

MB

Qualification due to method blank contamination.

MERCURY
USEPA Region II – Data Validation

Project Name: Naval Weapons Industrial Reserve Plant, GM-38 Area-LTM
Location: 100 Broadway, Bethpage, NY
SDG #: R1902053
Client: KOMAN Government Solutions, LLC
Date: 04/24/2019
Laboratory: ALS Environmental, Middletown, PA
Reviewer: Sherri Pullar

Summary:

1. Data validation was performed on the data for nine (9) water samples and one (1) field blank analyzed for Mercury by EPA Method 245.1.
2. The samples were collected on 3/05 through 3/07/2019. The samples were submitted to ALS Environmental, Middletown, PA on 3/08/2019 for analysis.
3. The USEPA Region II SOP No. HW-2C, Revision 15, December 2012, Mercury and Cyanide Data Validation; USEPA National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001, January 2017 and Quality Assurance Project Plan for GM-38 Area, Naval Weapons Industrial Reserve Plant, Bethpage, NY; September 3, 2009 were used in evaluating the Mercury data in this summary report.
4. In general, the data are valid as reported and may be used for decision making purposes. Selected data points were qualified due to nonconformance of certain Quality Control criteria (See discussion below).



Samples:

The samples included in this review are listed below:

Client Sample ID	Laboratory Sample ID	Collection Date	Matrix	Sample Status
GM-38-GW-RW3-MW4-0319	R1902053-001	3/05/2019	Water	
GM-38-GW-RW3-MW3-0319	R1902053-002	3/05/2019	Water	
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	3/05/2019	Water	Field Duplicate of sample GM-38-GW-RW3-MW3-0319
GM-38-GW-RW3-MW2-0319	R1902053-004	3/05/2019	Water	
GM-38-GW-RW3-MW1-0319	R1902053-005	3/05/2019	Water	
GM-38-GW-TP1-0319	R1902053-006	3/06/2019	Water	
GM-38-EB-0319	R1902053-007	3/06/2019	Water	Equipment Blank
GM-38-GW-RW1-MW1-0319	R1902053-010	3/07/2019	Water	
GM-38-GW-RW2-MW1-0319	R1902053-011	3/07/2019	Water	
GM-38-GW-RW1-MW3-0319	R1902053-012	3/07/2019	Water	

Sample Conditions/Problems:

1. The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data. No qualifications were required.

Holding Times:

1. All water samples were digested and analyzed within the 28 days holding times for Mercury. No qualifications were required.

Initial and Continuing Calibration Verification (ICV and CCV):

1. The correlation coefficient for Mercury calibration curve analyzed was ≥ 0.995 . No qualifications were required.



2. All ICVs and CCVs %REC values were within the QC limits (80-120%). No qualifications were required.

Blanks (Method Blank, ICB and CCB):

1. All ICBs and CCBs were free of contamination. No qualifications were required.
2. Method Blank digested on 3/12/2019 was free of contamination. No qualifications were required.

Field Blank (FB) and Equipment Blank (EB):

1. Field Blank (GM-38-EB-0319) (R1902053-007) analyzed on 3/13/2019 was free of contamination. No qualifications were required.

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD):

1. Mercury %REC in Laboratory Control Sample (LCSW) analyzed on 03/13/2019 was within the laboratory control limits. No qualifications were required.

Laboratory Duplicate:

1. Laboratory Duplicate was performed on sample GM-38-GW-RW3-MW3-0319 (R1902053-002). All RPDs were within the laboratory control limits. No qualifications were required.

Field Duplicate:

1. Sample GM-38-GW-RW3-MW3-DUP-0319 (R1902053-003) was collected as field duplicate for sample GM-38-GW-RW3-MW3-0319 (R1902053-002). All RPDs were ≤50.0%. No qualifications were required.

Field Sample	Compound	Analytical Method	Result	Units	Field Duplicate	Result	Units	RPD	Qualifier
GM-38-GW-RW3-MW3-0319	Mercury	EPA 245.1	0.088	µg/l	GM-38-GW-RW3-MW3-DUP-0319	0.122	µg/l	32.4	None

Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) and Duplicate/Laboratory Duplicate:

1. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) were performed on sample GM-38-GW-RW3-MW3-0319 (R1902053-002). All %RECs and RPD were within the laboratory control limits. No qualifications were required.



Compound Quantitation and Reported Detection Limits:

1. All sample results were reported within the linear calibration range.

Comments:

1. Validation qualifiers (if required) were entered into the EDD for SDG: R1902053.
2. Summary of the qualified data is listed in the Qualification Summary Table for SDG: R1902053 at the end of the data validation report.

**NWIRP BETHPAGE GM-38
MARCH 2019 EVENT
QUALIFICATION SUMMARY TABLE
AQUEOUS
SDG: R1902053
MERCURY**

Sample Name	Lab ID	Analytical Method	Analyte	Unit	Reported Result	Lab Qualifier	Validated Value	DV Qualifier	Reason Code
No qualifiers were added after data validation.									

NOTE: Only results that had qualifications added after validation are listed in this table.

GENERAL CHEMISTRY
USEPA Region II – Data Validation

Project Name: Naval Weapons Industrial Reserve Plant, GM-38 Area-LTM
Location: 100 Broadway, Bethpage, NY
SDG #: R1902053
Client: KOMAN Government Solutions, LLC
Date: 04/24/2019
Laboratory: ALS Environmental, Middletown, PA
Reviewer: Sherri Pullar

Summary:

1. Data validation was performed on the data for ten (10) water samples analyzed for Solids, Total Suspended (TSS) by SM2540D.
2. The samples were collected on 3/5 thru 3/7/2019. The samples were submitted to ALS Environmental, Middletown, PA on 3/8/2019 for analysis.
3. Quality Assurance Project Plan for GM-38 Area, Naval Weapons Industrial Reserve Plant, Bethpage, NY; September 3, 2009 was used in evaluating the Solids, Total Suspended data in this summary report.
4. In general, the data are valid as reported and may be used for decision making purposes. No data points were qualified due to nonconformance of Quality Control criteria (See discussion below).

Samples:

The samples included in this review are listed below:

Client Sample ID	Laboratory Sample ID	Collection Date	Matrix	Sample Status
GM-38-GW-RW3-MW4-0319	R1902053-001	3/05/2019	Water	
GM-38-GW-RW3-MW3-0319	R1902053-002	3/05/2019	Water	
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	3/05/2019	Water	Field Duplicate of sample GM-38-GW-RW3-MW3-0319
GM-38-GW-RW3-MW2-0319	R1902053-004	3/05/2019	Water	
GM-38-GW-RW3-MW1-0319	R1902053-005	3/05/2019	Water	
GM-38-GW-TP1-0319	R1902053-006	3/06/2019	Water	
GM-38-EB-0319	R1902053-007	3/06/2019	Water	Equipment Blank
GM-38-GW-RW1-MW1-0319	R1902053-010	3/07/2019	Water	
GM-38-GW-RW2-MW1-0319	R1902053-011	3/07/2019	Water	
GM-38-GW-RW1-MW3-0319	R1902053-012	3/07/2019	Water	

Sample Conditions/Problems:

1. The Traffic Reports/Chain-of-Custody Records, Sampling Report and/or Laboratory Case Narrative did not indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data. No qualifications were required.

Holding Times:

1. All water samples were analyzed within the 7 days holding times for Solids, Total Suspended. No qualifications were required.

Method Blank (MB), Storage Blank (SB), Field Blank (FB), Rinsate Blank (RB) and Equipment Blank (EB):

1. Method Blank (R1902053-MB) analyzed on 3/12/2019 was free of contamination. No qualifications were required.



- Equipment Blank (GM-38-EB-0319) (R1902053-007) analyzed on 3/18/2019 was free of contamination. No qualifications were required.

Field Duplicate:

- Sample GM-38-GW-RW3-MW3-DUP-0319 (R1902053-003) was collected as field duplicate for sample GM-38-GW-RW3-MW3-0319 (R1902053-002). RPD was >50.0%.

Field Sample	Compound	Analytical Method	Result	Units	Field Duplicate	Result	Units	RPD	Qualifier
GM-38-GW-RW3-MW3-0319	TSS	2540D	5.1	mg/l	GM-38-GW-RW3-MW3-DUP-0319	1.6	mg/l	104.5	J

Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD):

- Laboratory Control Sample (R1902053-LCS1) was analyzed on 03/12/2019. All %RECs were within the laboratory control limits. No qualifications were required.

Laboratory Duplicate:

- Sample Duplicate was performed on sample GM-38-GW-RW3-MW3-0319 (R1902053-002). All RPDs were within the laboratory control limits. No qualifications were required.

Compound Quantitation and Reported Detection Limits:

- All sample results were reported within the linear calibration range.

Comments:

- Validation qualifiers (if required) were entered into the EDD for SDG: R1902053.
- Summary of the qualified data is listed in the Qualification Summary Table for SDG: R1902053 at the end of the data validation report.



NWIRP BETHPAGE GM-38
MARCH 2019 EVENT
QUALIFICATION SUMMARY TABLE
AQUEOUS
SDG: R1902053
GENERAL CHEMISTRY

Sample Name	Lab ID	Analytical Method	Analyte	Unit	Reported Result	Lab Qualifier	Validated Value	DV Qualifier	Reason Code
GM-38-GW-RW3-MW3-0319	R1902053-002	2540D	Total Suspended (TSS)	MG_L	5.1		5.1	J	FD
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	2540D	Total Suspended (TSS)	MG_L	1.6		1.6	J	FD

NOTE: Only results that had qualifications added after validation are listed in this table.

Reason Codes

FD

Qualification due to field duplicate criteria exceedance.



**NWIRP BETHPAGE GM-38
MARCH 2019 EVENT
DATA SUMMARY TABLE
AQUEOUS
SDG: R1902053**

Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-GW-RW3-MW4-0319	R1902053-001	2540D	20190312	1	Total Suspended (TSS)	1.30	MG_L			1
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,2-Dichloroethane	0.235	UG_L	J	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	cis-1,2-Dichloroethene	0.351	UG_L	J	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Chloroform	0.996	UG_L	J	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	0.481	UG_L	J	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	6.22	UG_L		1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	0.981	UG_L	J	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5



**NWIRP BETHPAGE GM-38
MARCH 2019 EVENT
DATA SUMMARY TABLE
AQUEOUS
SDG: R1902053**

Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	Trichloroethene (TCE)	2.12	UG_L	J	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW4-0319	R1902053-001	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	2540D	20190312	1	Total Suspended (TSS)	5.10	MG_L	J		1
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	245.1	20190313	1	Mercury	0.088	UG_L	J	0.1	0.2
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	0.594	UG_L	J	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	2.21	UG_L	J	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	1.17	UG_L	J	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Chloroform	0.420	UG_L	J	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	cis-1,2-Dichloroethene	0.840	UG_L	J	1	5



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	Trichloroethene (TCE)	151	UG_L		1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-0319	R1902053-002	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	2540D	20190312	1	Total Suspended (TSS)	1.60	MG_L	J		1
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	245.1	20190313	1	Mercury	0.122	UG_L	J	0.1	0.2
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	0.599	UG_L	J	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	1.97	UG_L	J	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	1.14	UG_L	J	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Chloroform	0.370	UG_L	J	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-0319	R1902053-003	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	cis-1,2-Dichloroethene	0.805	UG_L	J	1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	Trichloroethene (TCE)	147	UG_L		1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW3-DUP-031	R1902053-003	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	cis-1,2-Dichloroethene	1.10	UG_L	J	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Chloroform	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5



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DATA SUMMARY TABLE
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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	0.364	UG_L	J	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	0.256	UG_L	J	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,1,2-Trichloroethane	0.240	UG_L	J	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Trichloroethene (TCE)	118	UG_L		1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW2-0319	R1902053-004	2540D	20190312	1	Total Suspended (TSS)	1.00	MG_L	U		1
GM-38-GW-RW3-MW2-0319	R1902053-004	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	cis-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Chloroform	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5



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DATA SUMMARY TABLE
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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Trichloroethene (TCE)	19.3	UG_L		1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-RW3-MW1-0319	R1902053-005	2540D	20190312	1	Total Suspended (TSS)	16.4	MG_L			1
GM-38-GW-RW3-MW1-0319	R1902053-005	624.1	20190316	1	Tetrachloroethene (PCE)	1.72	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	2540D	20190312	1	Total Suspended (TSS)	1.10	MG_L			1
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	cis-1,2-Dichloroethene	6.01	UG_L		1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Chloroform	0.684	UG_L	J	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	0.717	UG_L	J	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	Trichloroethene (TCE)	28.3	UG_L		1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-GW-TP1-0319	R1902053-006	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Acrylonitrile	100	UG_L	U		100
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Toluene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	cis-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,3-Dichloropropene, Total	10	UG_L	U		10



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Chloroform	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Benzene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,1,1-Trichloroethane (TCA)	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Bromoform	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,1-Dichloroethane (1,1-DCA)	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,1-Dichloroethene (1,1-DCE)	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Trichloroethene (TCE)	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	624.1	20190318	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-EB-0319	R1902053-007	2540D	20190312	1	Total Suspended (TSS)	1.00	MG_L	U		1
GM-38-EB-0319	R1902053-007	624.1	20190318	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Acrylonitrile	100	UG_L	U		100
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Toluene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	cis-1,2-Dichloroethene	1.00	UG_L	U	1	5



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,3-Dichloropropene, Total	10	ug/l	U		
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Chloroform	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Benzene	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,1,1-Trichloroethane (TCA)	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Bromoform	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,1-Dichloroethane (1,1-DCA)	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,1-Dichloroethene (1,1-DCE)	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	Trichloroethene (TCE)	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-TB01-0319	R1902053-008	624.1	20190312	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Acrylonitrile	100	UG_L	U		100
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Toluene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Dibromochloromethane	1.00	UG_L	U	1	5



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	cis-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,3-Dichloropropene, Total	10	ug/l	U		
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Chloroform	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Benzene	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,1,1-Trichloroethane (TCA)	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Bromoform	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,1-Dichloroethane (1,1-DCA)	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,1-Dichloroethene (1,1-DCE)	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	Trichloroethene (TCE)	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-TB02-0319	R1902053-009	624.1	20190312	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-RW1-MW1-0319	R1902053-010	2540D	20190312	1	Total Suspended (TSS)	1.00	MG_L	U		1.1
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	cis-1,2-Dichloroethene	3.86	UG_L	J	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Chloroform	0.573	UG_L	J	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	1.16	UG_L	J	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	7.89	UG_L		1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	2.19	UG_L	J	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Trichloroethene (TCE)	110	UG_L		1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW1-0319	R1902053-010	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	2540D	20190312	1	Total Suspended (TSS)	24.2	MG_L			1
GM-38-RW2-MW1-0319	R1902053-011	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5



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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,2-Dichloroethane	0.552	UG_L	J	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	cis-1,2-Dichloroethene	2.42	UG_L	J	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Chloroform	2.03	UG_L	J	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	0.761	UG_L	J	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	7.81	UG_L		1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	1.67	UG_L	J	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,1,2-Trichloroethane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Trichloroethene (TCE)	9.65	UG_L		1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW2-MW1-0319	R1902053-011	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	245.1	20190313	1	Mercury	0.100	UG_L	U	0.1	0.2
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Ethylbenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	cis-1,3-Dichloropropene	1.00	UG_L	U	1	5



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DATA SUMMARY TABLE
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Sample Name	Lab ID	Analytical Method	Analysis Date	Dilution Factor	Analyte	Result	Unit	Qualifier	LOD	LOQ
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	trans-1,3-Dichloropropene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,4-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,2-Dichloroethane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Acrylonitrile	100	UG_L	U		100
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Toluene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Chlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Dibromochloromethane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	cis-1,2-Dichloroethene	0.398	UG_L	J	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	trans-1,2-Dichloroethene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,3-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,3-Dichloropropene, Total	10	UG_L	U		10
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Carbon Tetrachloride	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Chloroform	0.725	UG_L	J	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Benzene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,1,1-Trichloroethane (TCA)	1.27	UG_L	J	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Bromomethane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Chloromethane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Chloroethane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Vinyl Chloride	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Methylene Chloride	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Bromoform	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Bromodichloromethane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,1-Dichloroethane (1,1-DCA)	4.14	UG_L	J	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,1-Dichloroethene (1,1-DCE)	1.08	UG_L	J	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Trichlorofluoromethane (CFC 11)	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,2-Dichloropropane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,1,2-Trichloroethane	0.296	UG_L	J	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Trichloroethene (TCE)	4.49	UG_L	J	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,1,2,2-Tetrachloroethane	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	1,2-Dichlorobenzene	1.00	UG_L	U	1	5
GM-38-RW1-MW3-0319	R1902053-012	2540D	20190312	1	Total Suspended (TSS)	8.60	MG_L			1
GM-38-RW1-MW3-0319	R1902053-012	624.1	20190316	1	Tetrachloroethene (PCE)	1.00	UG_L	U	1	5