Dvirka and Bartilucci Consulting Engineers
A Division of D&B Engineers and Architects, P.C.

ACTIVE INDUSTRIAL UNIFORM SITE GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

Latitude 40.677°, Longitude -73.365°

REPORT TITLE

Site Management Quarterly Report No. 33

REPORTING PERIOD

January 1, 2013 through March 31, 2013

CLIENT

New York State Department of Environmental Conservation

David Gardner, Project Manager
email: drgardne@gw.dec.state.ny.us

CONSULTANT

Dvirka and Bartilucci Consulting Engineers

Stephen Tauss, Project Manager
email: stauss@db-eng.com

3150-07 - AIU Quarterly Report 33.indd (05/16/13 - 3:45 PM)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation
625 Broadway, 12th Floor, Albany, New York 12233

Site

NYSDEC Site No. 152125, Active Industrial Uniform Site Groundwater Extraction and Treatment System, Village of Lindenhurst, Town of Babylon, Suffolk County, New York.

Project Background and Site Description

The Active Industrial Uniform (the Site) groundwater extraction and treatment system (GWE&TS) was designed to recover and treat a chlorinated solvent-contaminated groundwater plume emanating from the Site, a former dry cleaning and laundry facility. Dry cleaning activities were conducted at the Site from the 1980's to 1987. The GWE&TS has been in operation since December 2001; however, D&B assumed site management duties for the Site in February 2005. Refer to *Figure 1* for a Site location map depicting the GWE&TS location.

Groundwater Extraction and Treatment System Overview

The GWE&TS consists of two, 8-inch diameter extraction wells, with one located on-site in the southwest portion of the Site (RW-1), and one located off-site, approximately 1,500 feet southwest of the Site (RW-2). As per NYSDEC direction, extraction well RW-2 was shut-down in April 2010 due to low historic VOC concentrations, and is now being monitored on a quarterly basis. Extracted groundwater is conveyed to the GWE&TS building via underground piping to two series-configured packed-tower air strippers. Based on an evaluation of each of the packed-tower air stripper's performance over the last several years of operation and in order to reduce the electrical consumption of the overall GWE&TS, one of the two air stripper towers (Stripper Tower No. 1) was taken out of service in May 2011. Treated groundwater is pumped via underground piping to a storm water basin located approximately 1,000 feet west of the Site, which subsequently discharges into Little Neck Creek, in accordance with all applicable discharge standards. Exhaust gas from each air stripper tower was treated utilizing two granular activated carbon (GAC) vessels in series. Based on low historic contaminant concentrations detected in the air stripper exhaust gas, the air stripper exhaust piping was reconfigured to bypass the GAC vessels and discharge directly to the atmosphere in June 2011, per the direction of the NYSDEC. The GWE&TS is equipped with instrumentation and controls which allow for automated start-up and operation, and an autodial alarm notification system. Refer to *Figure 2* for an "as-built" system layout diagram.

As per NYSDEC direction, the GWE&TS was shut-down on December 12, 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent and as a Remedial Site Optimization (RSO) evaluation was initiated in January 2013. Based on the results of groundwater sampling completed on November 9 and 12, 2012, extraction well RW-2 will be restarted upon system restart. In addition, based on elevated VOC concentrations detected in aqueous-phase effluent on October 18, November 15 and December 12, 2012, Stripper Tower No. 1 will again be utilized upon system restart.

Regulatory Requirements/Cleanup Goals

Site-specific remedial goals have been established through the remedy selection process and are documented in the Record of Decision (ROD), dated March 1997. The site-specific goals outlined in the March 1997 ROD are provided in *Attachment A*. The overall goal is to meet all appropriate Standards, Criteria, and Guidance (SCGs) and to be protective of human health and the environment. Implementation of the GWE&TS is specifically focused on the following goals:

- Reduce, control, or eliminate contaminated media to the extent practicable;
- Eliminate the threat to surface waters by remediating groundwater to the extent practicable;
- Mitigate the impacts of contaminated groundwater to the environment;
- Prevent, to the extent possible, migration of contaminants;
- Provide for attainment of SCGs for groundwater, soil and indoor air within the limits of the affected area, to the extent practical; and
- Reduce the threat of inhalation of site-related vapor-phase contaminants to residents within homes downgradient of the Site.

Treatment System Performance Summary

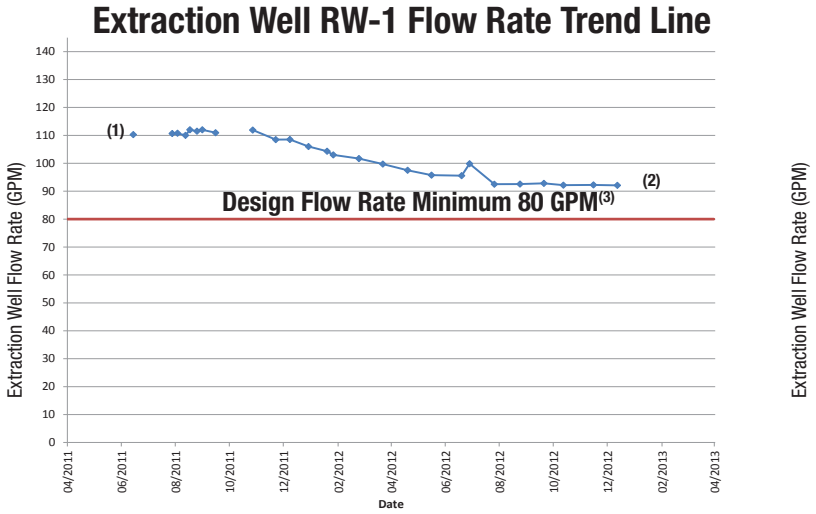
The GWE&TS performance during the current reporting period and since D&B assumed O&M duties in February 2005 is summarized below.

System Extraction Rates and Total Flow Volumes

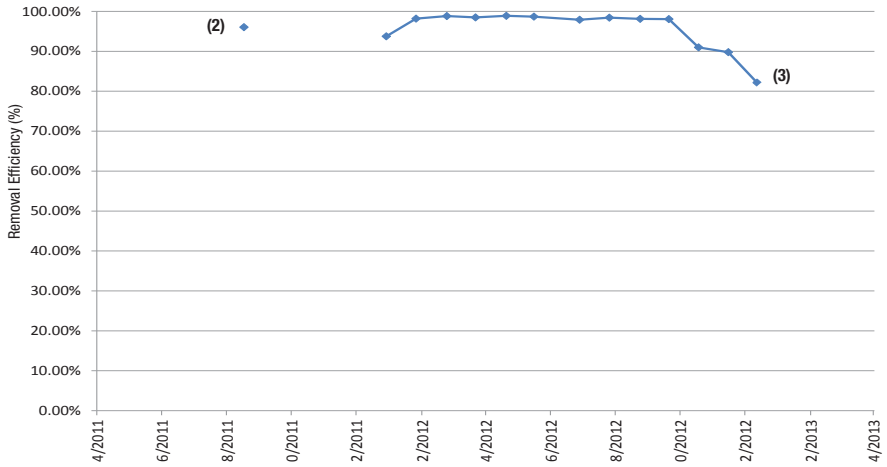
	RW-1 (1)	RW-2 (2)	System Effluent
Average Pumping Rate - Current Reporting Period	NA	NA	NA
Average Pumping Rate - Previous Reporting Period	92 gpm	NA	93 gpm
Average Pumping Rate to Date	76 gpm	80 gpm	104 gpm
Total Flow Volume - Current Reporting Period	0 gal.	NA	0 gal.
Total Flow Volume to Date	342,024,559 gal.	129,900,729 gal.	469,953,446 gal.

NA: Not applicable

1. The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent and as a RSO was planned to be completed at the Site.
2. As described above, extraction well RW-2 was shut-down in April 2010 based on low historic VOC concentrations, as per NYSDEC direction.



1. The GWE&TS did not operate the majority of the time from December 2010 through July 2011 and September 2011 through October 2011 due to a carbon vessel bed screen failure and residential neighbor complaints pertaining to a loud noise being emitted by the GWE&TS exhaust piping.
2. The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent and as a RSO was planned to be completed at the Site.
3. Based on design information presented in the Active Industrial design documents, containment of the Active Industrial chlorinated plume could be achieved with on-site extraction well RW-1 operating at a minimum of 80% of the design flow rate of 100 GPM (80 GPM).



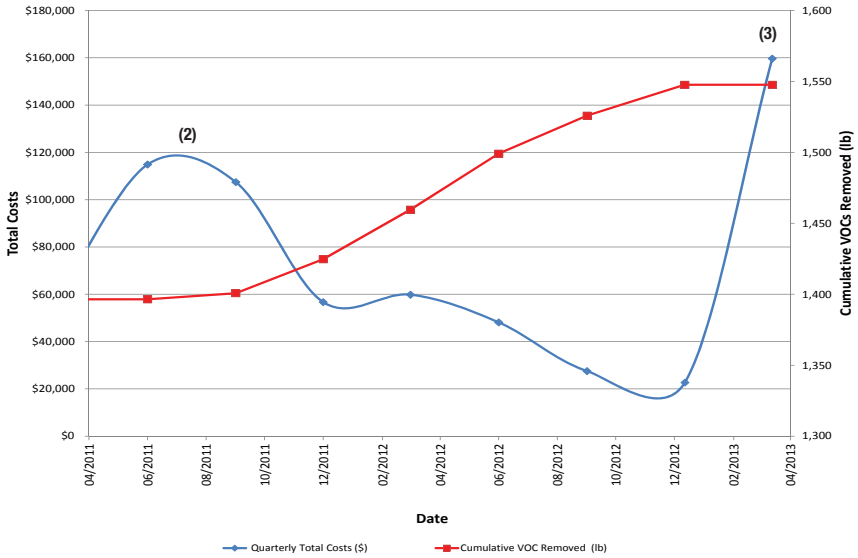
1. The packed-tower air strippers have operated at an approximate efficiency ranging from 82.16% to 99.47% since D&B assumed O&M duties in February 2005.
2. The GWE&TS did not operate the majority of the time from December 2010 through July 2011 and September 2011 through October 2011 due to a shut down related to a carbon vessel bed screen failure and residential neighbor complaints pertaining to a loud noise being emitted by the GWE&TS exhaust piping.
3. The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent and as a RSO was planned to be completed at the Site.

VOC Removal Assessment	
VOC Removal - Current Reporting Period	0.00 lbs.
VOC Removal - Previous Reporting Period	21.72 lbs.
Average VOC Removal to Date	26.33 lbs.
Total VOC Removal to Date	1,548 lbs.

VOC Removal Costs (1)	
VOC Removal Cost - Current Reporting Period (2)	NA
VOC Removal Cost - Previous Reporting Period	$1,045 per lb.
Average VOC Removal Cost to Date (3)	$2,108 per lb.

1. The VOC removal costs include monthly utility charges, maintenance costs and engineering costs. Capital construction costs and NYSDEC project management effort are not included in this evaluation.
2. The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent and as a RSO was planned to be completed at the Site.
3. Average calculated from when D&B assumed O&M duties in February 2005 through this reporting period.

VOC Removal/Operational Cost Trend Line (1)



1. The VOC removal costs include monthly utility charges, maintenance costs and engineering costs. Capital construction costs and NYSDEC project management effort are not included in this evaluation.
2. Costs reflected for these reporting periods are primarily the result of contaminated soil excavation activities and NYSDEC-approved system modifications, per the approval of the NYSDEC.
3. Costs reflected for this reporting period is primarily the result of a RSO evaluation, per the approval of the NYSDEC.

System Operation and Maintenance

Routine and non-routine maintenance completed during this reporting period and a summary of the alarm conditions and associated GWE&TS runtime/downtime for this reporting period are summarized below. Refer to *Attachment B* for operation and maintenance logs, as prepared by the NYSDEC "call-out" contractor for this reporting period.

Routine Equipment Maintenance Schedule Summary

Major System Component	Manufacturer	Model Number	Maintenance Frequency	Maintenance Summary					
				Current Reporting Period			Next Reporting Period		
				Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13
Extraction Well Pump RW-1	Grundfos Pump Corp.	150550-2	As needed based on flow trends						
Extraction Well Pump RW-2	Grundfos Pump Corp.	1505100-5	As needed based on flow trends						
Pressure Blower (1)	Cincinnati Fan	PB-18	Bi-Monthly						
Vapor Carbon Vessels	Cameron Great Lake	VS7.2x6.7x8.6-5000-DUAL	As needed based on analytical results						
Air Strippers	Branch Environmental	48T-25H	As needed based contaminant concentrations						
Air Stripper Transfer Pumps (1)	Magnatex Pumps, Inc.	MTA-A10-P-F20-2-FE	Quarterly						

Planned Activity

1. Note that the pressure blower and air stripper transfer pump maintenance items were not completed during this reporting period. Pressure blower, as well as air stripper transfer pump maintenance, will be scheduled upon start-up of the GWE&TS.

Non-Routine System Maintenance:

- The packing on the air stripper towers was removed and replaced between February 4 and 19, 2013. In addition, the sumps of the air stripper towers were cleaned;
- The air stripper towers and influent piping for extraction wells RW-1 and RW-2 were reconfigured to accommodate influent water from both extraction wells on February 20, 2013;
- Recurring high level alarms in the air stripper towers indicated that the treatment system transfer pumps are not currently capable of pumping water at a sufficient rate to manage the combined influent flow generated from concurrently operating extraction wells RW-1 and RW-2. The treatment system is designed to accommodate a flow of 200 gpm; though, a combined flow of approximately 160 to 170 gpm was observed at the time of these system alarms/shut-downs. Based on these shut-downs, the accessible areas of the system effluent piping and Transfer Pump No. 2 were inspected for blockages and malfunctions/damage, respectively, on February 22, 2013;
- Transfer Pump No. 2 was troubleshot on March 4, 2013; and
- Transfer Pump No. 2 was removed for inspection and repair on March 7, 2013.

During the aqueous-phase effluent flow limitation assessments and investigations performed during this and the following reporting period, the effluent piping within the treatment system was inspected for blockages and Transfer Pump No. 2 was assessed for damage/malfunction. Slight scaling in the effluent piping was identified and the impellors in Transfer Pump No. 2 were found to be damaged. As it was believed that the damaged impellors were a major contributor to the observed effluent flow limitations, D&B recommended that Transfer Pump No. 2 be repaired or replaced. Following a cost evaluation D&B recommended the pump be removed, repaired and reinstalled, which occurred during the following reporting period.

Following the reinstallation of Transfer Pump No. 2, system effluent flow capabilities remained below the 200 gpm design criteria. As Transfer Pump No. 2 is likely no longer contributing to the effluent flow limitations, it is possible that a partial blockage in the effluent piping may exist, or that scaling throughout the effluent piping may have developed over the course of the last eight years since the system was installed, which is impeding the effluent flow.

It should be noted that similar effluent flow limitations were observed in 2010. As the transfer pumps appeared to be operating properly, the pump impellors were not investigated at that time. Rather, the system effluent piping was scoped in an attempt to identify a partial blockage in the piping. However, several 90 degree elbows in the piping prevented scoping activities to continue further than approximately 20 to 25 feet west of the treatment system building. Slight scaling was noted in the inspected piping. It should also be noted that, as extraction well RW-2 was shut down in 2010, the flow requirements of the system operating with only one extraction well (approximately 100 gpm) did not warrant further investigation or any mitigating activities at that time. As such, the effluent piping investigation was not continued at that time.

RSO Evaluation:

A soil boring and groundwater sampling program was initiated in February 2013 as part of an overall RSO evaluation of the Site. Soil and groundwater samples were collected from both on-site and off-site areas of the Site for chemical analysis by the NYSDEC "call-out" contractor throughout this reporting period. D&B and D&B's subconsultant TRC provided periodic oversight during implementation of this field work. The results of this sampling program, as well as other evaluations performed as part of the overall RSO, will be summarized in an upcoming RSO report.

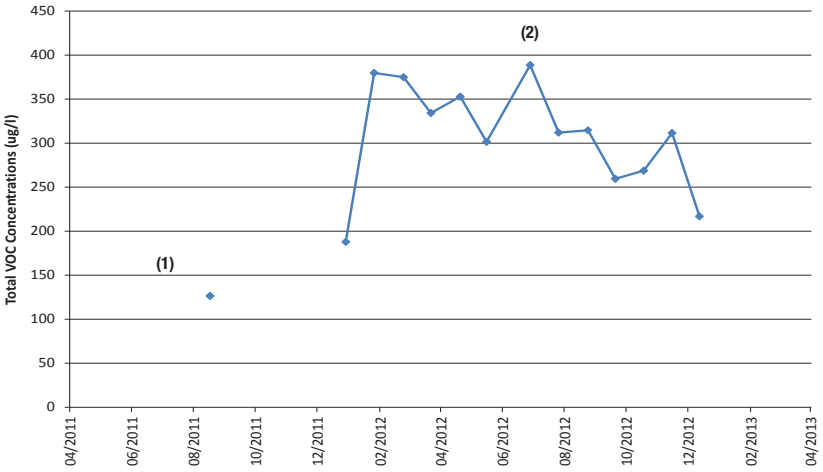
System Runtime/Downtime Summary		
Runtime - Current Reporting Period (1)	0 hours	0.0%
Downtime - Current Reporting Period (1)	2,160 hours	100.0%
Total Runtime to Date (2)	53,040 hours	75.9%
Total Downtime to Date (2)	16,867 hours	24.1%

1. Total elapsed runtime for current reporting period is 2,160 hours (January 1, 2013 through March 31, 2013). The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent and as a RSO was planned to be completed at the Site.
2. Based on when D&B assumed O&M duties in February 2005.

System Monitoring and Sampling Results

A summary of the pertinent routine treatment system monitoring and sampling results are provided below.

Extraction Well RW-1 Total VOC Concentration Trend Line



1. The GWE&TS did not operate during the majority of the time from December 2010 through July 2011 and September 2011 through October 2011 due to a carbon vessel bed screen failure and a continuous loud noise emitted by the GWE&TS exhaust piping.
2. This increase in total VOC concentration in extraction well RW-1 influent may be attributable to a lagging effect of the disturbance of the subsurface and contaminants during the latest soil removal IRM completed in June and July 2011.
3. The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent and as a RSO was planned to be completed at the Site.

Extraction Well RW-1 - System Influent Contaminant Concentration Ranges/Averages [1]

Contaminant [2]	Current Reporting Period [3]	Previous Reporting Period	Average to Date	Class GA Groundwater Standard
Tetrachlorothene (PCE)	--	130 ug/l - 190 ug/l	224 ug/l	5.0 ug/l
Trichlorothene (TCE)	--	29 ug/l - 44 ug/l	61 ug/l	5.0 ug/l
cis-1,2-Dichloroethene (cis-1,2-DCE)	--	56 ug/l - 75 ug/l	95 ug/l	5.0 ug/l
Vinyl chloride (VC)	--	1.4 ug/l - 1.7 ug/l	0.82 ug/l	2.0 ug/l
Iron	--	136 ug/l - 382 ug/l	173 ug/l	300 ug/l
Manganese	--	989 ug/l - 1,040 ug/l	1,235 ug/l	300 ug/l
Sodium	--	23,600 ug/l - 26,500 ug/l	25,162 ug/l	20,000 ug/l
pH	--	6.06 - 6.09	6.2	6.5-8.5

ND: Constituent concentration below the analytical detection limit. - - : Not analyzed.

Red font denotes an exceedance of the applicable standard.

1. Only includes constituents consistently or periodically detected in exceedance of their respective Class GA Groundwater Standard.
2. Click on the blue-colored contaminants for graphs of VOC concentrations over the last 2 years for VOCs detected above the Class GA Groundwater Standards for this and/or the previous reporting periods.
3. The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent.

Aqueous-Phase Air Stripper Effluent Concentration Ranges (1)			
Discharge Permit Parameters	Current Reporting Period (2)	Previous Reporting Period	Site-Specific Effluent Limit
PCE	--	9.7 ug/l - 16 ug/l	4.0 ug/l
TCE	--	3.5 ug/l - 5.3 ug/l	10.0 ug/l
cis-1,2-DCE	--	11 ug/l - 17 ug/l	10.0 ug/l
VC	--	ND	10.0 ug/l
Iron	--	1,970 ug/l	4,000 ug/l
Manganese	--	2,280 ug/l	2,000 ug/l
Sodium	--	27,300 ug/l	NA
pH	--	7.90	6.0 - 9.0

ND: Constituent concentration below the analytical detection limit. NA: Not applicable.

1. Only includes constituents historically detected in exceedance of their respective Class GA Groundwater Standard in influent water.
2. The GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in system aqueous-phase effluent.

Based on direction from NYSDEC, and as aqueous-phase VOC concentrations exceeded site-specific discharge limits during the previous reporting period, the GWE&TS was shut-down on December 12, 2012. It should be noted that a RSO evaluation is currently being performed to evaluate the GWE&TS equipment efficiency and operation.

Vapor-Phase Air Stripper Effluent Concentrations (1)			
	Current Reporting Period	Previous Reporting Period	Site-Specific Limits
PCE	--	0.0069 lbs/hr	0.007 lbs/hr
TCE	--	0.001 lbs/hr	0.006 lbs/hr
Xylene	--	ND	0.001 lbs/hr
1,2-DCE (total)	--	0.002 lbs/hr	0.003 lbs/hr
VC	--	0.000028 lbs/hr	0.014 lbs/hr
1,1,1-TCA	--	ND	0.001 lbs/hr
Maximum Total VOC Emissions	--	0.010 lbs/hr	0.5 lbs/hr (2)

ND: Constituent concentration below the analytical detection limit. NA: Not applicable. - - : Not analyzed.

Red font denotes an exceedance of the applicable site-specific limit.

1. As the GWE&TS was shut-down in December 2012 due to elevated VOC concentrations detected in aqueous-phase effluent, vapor-phase effluent samples for laboratory analysis were not collected during this reporting period. It should be noted that vapor-phase effluent samples for laboratory analysis are collected on a semi-annual basis.
2. The site-specific effluent limit of 0.5 lbs/hr was developed in consultation with the NYSDEC and is utilized as a means to monitor total vapor-phase VOCs emitted by the GWE&TS.

Quarterly Groundwater Monitoring Summary

The network of groundwater monitoring wells was sampled to determine groundwater quality at, and in the vicinity of, the Site. Samples were collected from seven on-site groundwater monitoring wells (MW-103 through MW-107, MW-4D and MW-5S), one off-site groundwater monitoring well (MW-2S) and off-site extraction well RW-2.

The locations of the on-site groundwater monitoring wells are depicted on *Figure 3* and the locations of off-site groundwater monitoring wells are depicted on *Figure 4*.

Groundwater Monitoring Well Condition Summary:

All groundwater monitoring wells and extraction well RW-2 were found to be accessible during the groundwater monitoring sampling events conducted on March 4 and 5, 2013. Although all groundwater monitoring wells were located as indicated on the Site map, not all wells had visible well IDs. All monitoring well concrete well pads, protective casings, surface seals, PVC well risers, well plugs and locks were observed to be present and in good condition, with the following exceptions:

- The surface seals at monitoring well MW-104, MW-4D and MW-5S are missing; and
- Concrete well pads and protective casings are not present at monitoring well locations MW-104 and MW-5S.

A summary of the field inspection logs for all groundwater monitoring wells assessed during this reporting period are provided in *Attachment C* with the exception of monitoring wells MW-106 and MW-107 and extraction well RW-2, as the field inspection logs were inadvertently not completed by the NYSDEC "call-out" contractor.

Groundwater Monitoring Results Summary:

A headspace reading was collected utilizing a PID at each groundwater monitoring well immediately after the removal of the well caps and plugs. The on-site groundwater monitoring wells exhibited concentrations of total VOCs ranging from 1.5 ppm to a maximum concentration of 658 ppm detected at groundwater monitoring well MW-4D. The off-site groundwater monitoring well MW-2S exhibited a concentration of total VOCs of 1.4 ppm.

Below is a table summarizing the site-specific contaminants of concern in on-site and off-site groundwater. Refer to *Attachment D* for analytical data results.

Site-Specific Contaminant of Concern Concentrations

Monitoring Well [1,2]	PCE		TCE		cis-1,2-DCE		Vinyl Chloride		Site-Specific 2-Year Contaminant Trend Analysis
	Current Reporting Period	Previous Reporting Period	Current Reporting Period	Previous Reporting Period	Current Reporting Period	Previous Reporting Period	Current Reporting Period	Previous Reporting Period	
On-Site Monitoring Wells									
MW-101	NS	1.2 ug/l	NS	0.36 ug/l	NS	ND	NS	ND	Stable
MW-102	NS	1.6 ug/l	NS	0.40 ug/l	NS	ND	NS	ND	Stable
MW-103	1.7 ug/l	3.4 ug/l	0.85 ug/l	0.36 ug/l	17 ug/l	0.20 ug/l	2.5 ug/l	ND	Increasing
MW-104	31 ug/l	34 ug/l	3.2 ug/l	4.0 ug/l	7.9 ug/l	6.5 ug/l	ND	ND	Stable
MW-105	6.4 ug/l	0.67 ug/l	4.2 ug/l	0.27 ug/l	89 ug/l	ND	7.2 ug/l	ND	Decreasing
MW-106	18 ug/l	6.4 ug/l	43 ug/l	4.1 ug/l	33 ug/l	32 ug/l	5.0 ug/l	9.0 ug/l	Decreasing
MW-107	8.4 ug/l	6.7 ug/l	1.4 ug/l	0.92 ug/l	0.31 ug/l	1.3 ug/l	ND	ND	Stable
MW-108	NS	3.6 ug/l	NS	0.24 ug/l	NS	ND	NS	ND	Stable
MW-4D	4,600 ug/l	100,000 ug/l	300 ug/l	10,000 ug/l	ND	93 ug/l	ND	ND	NA
MW-5S	0.32 ug/l	0.59 ug/l	1.5 ug/l	0.79 ug/l	0.33 ug/l	0.24 ug/l	ND	ND	Stable
Off-Site Monitoring Wells									
MW-109	NS	1.5 ug/l	NS	2.3 ug/l	NS	2.0 ug/l	NS	ND	Increasing
MW-111	NS	ND	NS	ND	NS	ND	NS	ND	Stable
MW-2S	190 ug/l	7.0 ug/l	96 ug/l	2.4 ug/l	230 ug/l	8.8 ug/l	1.2 ug/l	0.96 ug/l	Decreasing
RW-2 [3]	1.6 ug/l	68 ug/l	1.5 ug/l	40 ug/l	1.7 ug/l	23 ug/l	ND	ND	Increasing

ND: Constituent concentration below the analytical detection limit. NS: Not sampled. NA: Not applicable

Red font denotes an exceedance of the constituents Class GA Groundwater Standard (5.0 ug/l for PCE, TCE and cis-1,2-DCE, and 2.0 ug/l for VC).

In addition to the contaminants listed in the table, 1,1-dichloroethane, 1,1-trichloroethane,1,2-dichlorobenzene, 1,4-dichlorobenzene, chlorobenzene, chloroform and trans-1,2-dichloroethene were detected in one or more monitoring well sample; however, these analytes were detected at concentrations well below their respective Class GA Groundwater Standards.

1. Click on monitoring well IDs for graphs depicting contaminant concentrations over the last 2 years in wells exhibiting exceedances of the Class GA Groundwater Standards for this and the previous reporting period.
2. Groundwater monitoring wells MW-101, MW-102, MW-108, MW-109 and MW-111 are now sampled on a semi-annual basis. As such, samples were not collected during this reporting period.
3. Extraction well RW-2 is now sampled on a quarterly basis in order to better monitor off-site contaminant concentrations.

The majority of the groundwater monitoring wells exhibit overall decreasing or stable concentrations of the site-specific contaminants over the past 2-year period. However, several increases in site-specific contaminant concentrations were noted in several monitoring wells, including on-site monitoring wells MW-103 and MW-105 through MW-107, during this reporting period, as compared to the last several reporting periods. A figure depicting total VOC concentrations in on-site and off-site wells is provided as *Figure 5*.

As indicated above, on-site monitoring well MW-4D exhibited dramatically lower concentrations of PCE and TCE, as compared to the previous reporting period. It should be noted that monitoring well MW-4D is screened at a depth approximately 30 feet deeper than on-site extraction well RW-1 and the on-site monitoring wells.

Data Validation:

All sample results have been reviewed by D&B and deemed valid and usable for environmental assessment purposes. Data Validation Checklists are presented in *Attachment E*. Based on D&B's review, qualification of the data was necessary for the following analyses:

- Trichloroethene was qualified as estimated in samples MW-103 through MW-105, MW-2S and MW-4D; and
- 1,1,2,2-Tetrachloroethane was not detected in samples and was qualified as an estimated detection limit in samples MW-103 through MW-105, MW-2S and MW-4D.

Findings and Recommendations

Findings:

- GWE&TS Operation: As a result of elevated VOC concentrations detected in system aqueous-phase effluent the system was shut-down in December 2012 and the GWE&TS was down the entire reporting period. Note that a RSO evaluation is currently being completed for the Site;
- GWE&TS Maintenance: Routine maintenance of the pressure blower and air stripper transfer pumps was not completed as per the requirements of the April 2002 O&M Plan. However, note the GWE&TS was not operating during this reporting period.

  Effluent flow limitations were noted and diagnosed during this reporting period. Transfer Pump No. 2 was diagnosed as having damaged impellors and was ultimately repaired following this reporting period. Flow limitations still remain and are currently attributed to either a partial blockage in the effluent piping or scaling throughout the effluent piping, possibly developing over the course of the last eight years since the system was installed;

- Monitoring Well Conditions: All groundwater monitoring wells were observed to be in good condition, with the following exceptions:
  - The surface seals at monitoring well MW-104, MW-4D and MW-5S are missing; and
  - Concrete well pads and protective casings are not present at monitoring wells MW-104 and MW-5S; and
- Monitoring Well Contaminant Concentrations: On-site groundwater monitoring wells MW-103 through MW-107 and MW-4D and off-site monitoring well MW-2S exhibited one or more of the site-specific VOCs at concentrations exceeding their respective Class GA Groundwater Standards during this reporting period. Several wells exhibited higher than typical site-specific contaminant concentrations during this reporting period. In addition, MW-4D exhibited an overall decrease in contaminant concentrations as compared to previous monitoring events.

  The RSO evaluation currently being completed will focus on these elevated/atypical contaminant concentrations, as well as the increase in site-specific contaminants in GWE&TS aqueous-phase effluent detected during the previous reporting period.

Recommendations:

- General GWE&TS: As per NYSDEC direction,the GWE&TS will remain off while the RSO evaluation is being performed;
- GWE&TS Maintenance: It is recommended that the NYSDEC "call-out" contractor perform non-routine system maintenance in an efficient and timely manner and record detailed field descriptions on the site activities log. In addition, it is recommended that the effluent piping be further investigated and the source of the flow limitations be rectified in the event that analytical data suggests that extraction well RW-2 should again be operated on a consistent basis. Based on current contaminant concentration information, extraction well RW-2 is not currently being operated;
- Monitoring Well Conditions: It is recommended that the NYSDEC "call-out" contractor complete the monitoring well field inspection logs during each sampling event. Well IDs should be permanently fixed and clearly marked on each groundwater monitoring well for identification purposes. In addition, it is recommended to install protective casings and well pads at monitoring wells MW-104 and MW-5S in order to ensure these wells are properly protected;

- Groundwater Sampling: Based on the atypically elevated contaminant concentrations detected in monitoring wells MW-103, MW-105 through MW-107 and MW-2S, D&B recommends that their next quarterly groundwater sampling event be conducted as soon as possible. In addition, it is recommended that the NYSDEC ensures that the "call-out" contractor is utilizing proper and consistent sampling techniques during each groundwater sampling event; and
- RSO Evaluation: As detailed above, a RSO evaluation is currently being performed to further investigate residual on-site contamination, GWE&TS equipment efficiency and operation, and possibly consider alternative remedial technologies, such as monitored natural alternation (MNA) and/or in-situ chemical injections.

Based on the elevated contaminant concentrations routinely detected in on-site monitoring well MW-104, MW-106, MW-108 and MW-4D and off-site monitoring well MW-2S, several temporary wells were installed and sampled at and downgradient of the Site to more accurately define the current location and depth of the groundwater plume as part of the RSO evaluation. Based on the results of the temporary well sampling, it may be warranted to install additional permanent monitoring wells in these areas and/or modify the current extraction well configuration in order to optimize and accelerate the recovery and treatment of the entire groundwater plume.

Results from these evaluations will be detailed in an upcoming RSO Report.

Reclassification/Delisting Evaluation

The Site was originally listed as a Class 2 Inactive Hazardous Waste Site by the NYSDEC in November 1990. Since this time, completion of the following project phases has occurred, as summarized below:

Project Phases and Completion Dates

Project Phase	*Completion Date*
Remedial Investigation	04/1994
Phase II Remedial Design Investigation	12/1998
Remedial Design	06/2000
Groundwater Extraction and Treatment System Construction	12/2001 (1)
UST Removal and Phase I Contaminated Soil Removal IRM	06/2010
Phase II Contaminated Soil Removal IRM	07/2011

1. Construction of the GWE&TS was completed in December 2001. The GWE&TS was placed into routine operation in December 2001 and D&B assumed O&M duties in February 2005.

Given the above, it does not appear that the Active Industrial Uniform Site can be reclassified at this time, pursuant to the requirements identified in 6 NYCRR §375-2.7, as site-related contamination has not been fully remediated and continues to constitute a significant threat to public health and the environment. As such, Site delisting is not recommended at this time, as all remediation and post-remediation activities have not been satisfactorily completed. Work continues to address residual on-site contamination and system optimization to expedite overall remediation and site closure.

Report Certification:

I have personally examined and am familiar with the information submitted in the referenced report. To the best of my knowledge and belief, and based upon my inquiry of those individuals immediately responsible for obtaining the information reported therein, I certify that the submitted information is true, accurate, and complete.

Project Director:

Richard M. Walka — **Date**
Senior Vice President

Project Manager:

Stephen E. Tauss — **Date**
Geologist II

Report Certification:

I have personally examined and am familiar with the information submitted in the referenced report. To the best of my knowledge and belief, and based upon my inquiry of those individuals immediately responsible for obtaining the information reported therein, I certify that the submitted information is true, accurate, and complete.

Project Director: Richard M. Walka — 6.7.13
Richard M. Walka — **Date**
Senior Vice President

Project Manager: Stephen Tauss — 6/7/13
Stephen E. Tauss — **Date**
Geologist II