AECOM Environment

Prepared for:
Superfund Standby Program
Albany, NY
60133923

Prepared by:
AECOM
Latham, NY

September 30, 2011

DRAFT

Annual Groundwater Sampling Report

Bedford Village Wells
Hunting Ridge Mall
Site 360009

Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

At the request of the New York State Department of Environmental Conservation (NYSDEC), AECOM Technical Services, Northeast, Inc. (AECOM) has prepared this Annual Groundwater Sampling Report for the Bedford Village Wells – Hunting Ridge Mall Inactive Hazardous Waste Disposal Site #3-60-009 (the "Site") located in the Town of Bedford, Westchester County, NY (**Figure 1**).

1.1 Background

The Site was investigated in 1978 as part of a county wide investigation of potable water supplies. It was discovered that a dry cleaner formerly located at the site was the source of chlorinated solvents in groundwater. In-situ chemical oxidation (ISCO) injection was selected as the remedy for groundwater at the Site in the NYSDEC Record of Decision (ROD), 1990.

A Preliminary Design Report, prepared by AECOM and submitted to the NYSDEC in February 2009, concluded that the information was insufficient to design a cost-effective mitigation program for the Site. AECOM conducted a Supplemental Site Investigation (SSI) in September 2009 to evaluate the distribution of contamination in soil and groundwater, to design a cost-effective mitigation program for the Site. The SSI Report was submitted to the NYSDEC in December 2009.

A Remedial Design Report was submitted to the NYSDEC in February 2010. The design included the installation of an additional monitoring well (MW-16), the injection of a 5-percent solution of sodium permanganate into the contaminated groundwater in the area extending from GP-6 to MW-3M (Figure 2), and pre and post injection groundwater sampling.

A Remedial Action Progress Report was submitted to the NYSDEC in November 2010. This report documented the ISCO injection conducted in August and September 2010 and the associated well installation and baseline groundwater sampling

This Annual Groundwater Sampling Report presents a discussion of the post ISCO injection groundwater sampling events.

2.0 Groundwater Sampling

There have been four groundwater sampling events conducted over the past year to monitor the effectiveness of the sodium permanganate injections conducted in August and September of 2010. Baseline groundwater samples were collected in August 2010 prior to the permanganate injection. Remedial action performance groundwater monitoring was conducted on October 25, 2010, January 6, 2011, March 31, 20011, and June 28, 2011. These monitoring events included the collection of groundwater samples from eight monitoring wells; MW-3M, MW-5M, MW-6M, MW-6S, MW-12, MW-14, MW-15 and MW-16. All groundwater samples were submitted to Adirondack Environmental Services, Inc. (Adirondack) in Albany, New York, for analysis. The groundwater samples were analyzed for volatile organic compounds (VOCs). Groundwater samples collected in June 2011 were analyzed for total and dissolved metals. The monitoring well locations are shown on **Figure 2**.

2.1 Methodology

VOC samples were collected using passive diffusion bags (PDBs). Depth to water measurements were collected using an interface probe prior to retrieving the bags for sampling. The interface probe was decontaminated with a liquinox bath and rinsed with distilled water between each use. The PDBs were then retrieved and the samples were collected. Prior to setting a new PDB a water quality meter, such as a down-well YSI or a Horiba U-22 was used to collect field parameters. The water quality meters were calibrated prior to sampling commenced each day and were decontaminated as necessary. Turbidity, dissolved oxygen (DO), oxidation reduction potential (ORP), conductivity, ph, temperature, color and odor of the groundwater were recorded in the project field book for routine events and on purging/sampling logs for the annual event.

For metals sampling during the June 28, 2011 sampling event three well volumes were purged using a dedicated bailer before collecting both filtered and unfiltered metals samples. Water level measurements, field parameters, and notes were recorded in a project dedicated field-book. Purge logs were completed for the June 2011 sampling event. The field notes and purge logs are attached as **Appendix A**.

All groundwater samples were collected in bottles provided by the laboratory. The VOC samples were analyzed for VOCs by EPA Method 8260. Metals analysis conducted on the groundwater samples collected in June 2011 were analyzed by EPA Methods 200.7 (TAL Metals), 245.1 (Mercury).

3.0 Results

3.1 Well Conditions

In general the monitoring wells at the site are in good condition; however several deficiencies or damages to the well network were noted during the sampling events including:

- Monitoring well MW-3M appears to have a broken joint or pinch in the casing at about 20-feet (ft) below ground surface. This brake in the casing has likely caused silting of the well and makes it difficult to sample. AECOM was unable to get a bailer or the water quality meter beyond the joint. A 0.75-inch passive diffusion bag was used to sample VOCs in this well due to the constriction. It is recommended that this well be abandoned and a new well drilled in place.

- Monitoring well MW-5M is pinched at the top of the PVC casing below the top of the steel protective casing. The PVC casing was cracked to allow sampling with a PDB and bailer. The PVC should be repaired by cutting the steel casing to allow access to the PVC to cut away the damaged section. The top of casing elevation should be surveyed following the repair.

- Monitoring well MW-16 has not been surveyed for location or casing elevation. The well should be surveyed in conjunction with repaired/replaced wells.

- Well caps were missing on many of the monitoring wells. Locking caps have been placed on all the wells used for monitoring. We recommend inspecting the other site wells for the lack of a locking cap and replacement as necessary.

3.2 Groundwater Elevation and Flow

Groundwater elevation data was collected during several sampling events. The results were constant with previous events demonstrating that there is a relatively flat groundwater gradient toward the east. The hydraulic gradient at the Site is approximately 0.007 ft/ft. There is little effect on groundwater seasonally at the Site with a slight increase in elevation in the spring and summer. In general groundwater is approximately 15 feet below ground surface at the site. A groundwater isoelevation is included as **Figure 3**. Groundwater elevation data from the well cluster MW-6M screened in the subsurface soil and MW-6D screened in the bedrock suggests that there is an upward gradient from the bedrock to the overly aquifer. This upward gradient may prevent the contaminants from migrating into the bedrock.

3.3 Volatile Organic Compounds

Chlorinated VOCs (CVOCs) possibly related to historical operations at the Site were consistently detected above NYSDEC Ambient Water Quality Standards (AWQS) in monitoring wells MW-3M, and MW-16. The samples collected from MW-14 contained CVOCs above AWQS in all but one quarter. These wells are all located in the Hunting Ridge Mall parking lot east of the site building. CVOCs were not detected in any of the samples from monitoring well MW-15 also located in the parking lot adjacent to the northeast of the site building.

CVOCs were not detected in the samples from the monitoring wells east of the Site on the Old Post Holdings, LLC property. The dissolved phase VOC results are presented on **Table 1**. The assumed extent of the total CVOC plume as of the most recent sampling event (June 2011) is depicted in **Figure 4**. A summary of the results are presented below.

The highest concentration of total CVOCs were consistently detected in the samples from MW-3M is monitoring well MW-3M located along the north side of Old Post Road. During each sampling event a number of VOCs were detected above AWQSs, including cis-1,2-dichloroethene(CIS), tetrachloroethene (PCE) and trichloroethene (TCE), all of which have a 5 µg/L standard. Concentrations of cis-1,2-dichloroethene increased then decreased slightly over the last year. During the June 28, 2011 sampling event it was detected at 41 µg/L. Both PCE and TCE have consistently been above their AWQS. While PCE has shown a decreasing trend, TCE has shown a slightly increasing trend. During the June 28, 2011 sampling event, PCE was detected at 89 µg/L and TCE at 19 µg/L. Although acetone has been detected above MDLs randomly over the last year, concentrations have always been below the standard of 50 µg/L. Chloromethane and methylene chloride were each detected above MDLs only once over the last year, during the January 6, 2011 sampling event. The CVOC trends for well MW-3M are shown on **Figure 5**.

Monitoring well MW-14 is located adjacent to the sidewalk along the south-east side of the on-site building. No constituents were detected above MDLs in MW-14 during the October 25, 2010 sampling event. Acetone was detected in the following three sampling events, but always below its AWQS of 50 µg/L. Cis-1,2-dichloroethene and PCE were detected during the last three sampling events above the 5 µg/L AWQS for both, increasing and then decreasing to be 12 µg/L and 23 µg/L, respectively, during the June 28, 2011 sampling event. TCE was detected during the March and June 2011 sampling events above the 5 µg/L AWQS, although only slightly with a 5.3 µg/L concentration during the June 2011 sampling event. The CVOC trends for well MW-14 are shown on **Figure 6**.

Located adjacent to the sidewalk at the eastern corner of the on-site building is MW-15. There were no detections above MDLs during the October 2010 and January 2011 sampling events at MW-15. Acetone was the only constituent detected above MDLs during the March and June 2011 sampling events. The concentrations during both events were below the AWQS of 50 µg/L. The CVOC trends for monitoring well MW-15 are presented on **Figure 7**.

Monitoring well MW-16 is located in the median of the main entranceway to the on-site building, to the southeast of MW-14. This well was installed in August 2011 just prior to the start of the permanganate injection. Acetone was detected during the 2011 sampling events but below the 50 µg/L AWQS each time. Cis-1,2-dichloroethene was detected above the AWQS of 5 µg/L during all sampling events, but only slightly over, with a 7.2 µg/L concentration during the June 2011 event. PCE was also detected above the 5 µg/L AWQS during all events, going up in concentration then back down, with a 12 µg/L concentration during the June 2011 sampling event. TCE was not detected in this well above the MDL of 5 µg/L during any event.

Monitoring wells MW-5M, MW-6M and MW-12, all located in the wooded area to the southeast of Old Post Road, have all had similar results throughout the sampling events. There were no detections above MDLs during the October 25, 2010 sampling event in each of these wells, and just one detection in each of the following events. Methylene chloride was detected above MDLs in each well during the January 6, 2011 sampling event and acetone in each during the March and June 2011 sampling events. There have never been detections above AWQSs in any of these wells.

Also located in the wooded area to the southeast of Old Post Road is MW-6S. No constituents were detected above MDLs in MW-6S during the October 25, 2010 and March 31, 2011 sampling events. Only methylene chloride was detected above MDLs during the January 6, 2011 sampling event and only acetone during the June 28, 2011 sampling event.

The VOCs acetone and methylene chloride were detected in many of the groundwater samples below the NYSDEC AWQS. The constituents are common laboratory contaminants and are not considered to be constituents of concern for the Site.

3.4 Metals

The results of the metals analysis are presented in **Table 2**. Metals analysis was conducted during the baseline sampling event in the June 2011 samples. The results show that the injection of sodium permanganate did not affect metals concentrations in groundwater. Results of the baseline groundwater sampling were similar to the post injection results. Antimony, arsenic, beryllium, cadmium, selenium, silver, thallium and mercury were not detected above method detection limits in any of the monitoring wells. Aluminum, barium, calcium, cobalt, copper, lead, nickel, potassium, vanadium and zinc were all detected above MDLs, but were all below their respective standards/guideline values.

Six of the eight wells sampled during the June 2011 sampling event had at least one metal concentration over the AWQS. Chromium, iron and sodium make up a majority of the exceedances. The outliers include manganese above the AWQS in MW-14, 15 and 16 and magnesium above the AWQS in MW-15.

3.5 Field Parameters

Field parameters (turbidity, dissolved oxygen (DO), oxidation reduction potential (ORP), conductivity, ph, temperature, color and odor) were taken at each monitoring well whenever a sample was collected. The primary indicators for the effectiveness and presence of sodium permanganate are ORP and color. Ideally following the injection of an oxidizer the ORP in the well will rise indicating that there is oxidizer and the injected strength in the aquifer. A purple color in the well would indicate that the permanganate has reached the well and is present in the aquifer. Neither elevated ORP nor purple color was detected in the monitoring wells during the post injection sampling events. These results indicate that the oxidation potential of the sodium permanganate was quickly spent on natural soil oxidant demand. This result is often observed during primary injections of oxidants. In all of the onsite wells (MWs 3M, 14, 15, and 16) ORP dropped one month after the injection (October 2010) as compared to the baseline ORP results (August 2010).

4.0 Conclusions and Recommendations

4.1 Remedial Action Performance

The groundwater and field parameter results suggest that that a majority of the permanganate injected in 2010 was spent on oxidizing naturally occurring metals and organics in the subsurface. This is the result typically observed following an initial injection. A drop in VOCs to non-detect was noted in the groundwater sample from MW-14 (10/2010) shortly after the injection total VOC concentrations rebounded in subsequent samples. The fact that ORP did not increase in the monitoring wells and that permanganate was not observed in the wells indicates that a tighter spacing of injection points may be required. A higher concentration of sodium permanganate may be required to overcome the natural oxidant demand.

The results indicate that CVOCs are still present in the aquifer below the site at levels above NYSDEC AGWQS. The data indicates that the plume is stable and is no longer migrating downgradient. The concentrations in the plume are stable and are to a degree degrading naturally. However, the data shows that the natural degradation is stalled in many cases at the CIS and TCE stage likely due to high DO levels (aerobic) in the aquifer as CVOCs are more readily degraded under anaerobic conditions. It is unlikely that the plume will degrade naturally under the current conditions.

The groundwater results from monitoring wells on Old Post Holdings property suggest that the injection activities did not mobilize contaminants or metals downgradient of the Site.

4.2 Recommendations

A second injection of sodium permanganate is recommended for the Site. Additional characterization of the aquifer properties is recommended prior to the implementation of additional injections at the Site. AECOM recommends the installation of three soil borings near the impacted wells for the collection of soil samples for the analysis of chemical oxidant demand and soil oxidant demand. Up to three undisturbed samples should be collected with Shelby tubes for the analysis of geotechnical parameters. The combination of the natural oxidant demand data and geotechnical parameters will be used to fine tune the permanganate concentration and injection spacing for the next injection.

As noted in *Section 3.1* the following actions are recommended for the monitoring wells at the Site.

- Abandonment and replacement of monitoring well MW-3M is recommended. The replacement well should be installed with a flush mount finish to avoid damage by grass mowing and snow removal activities.
- The PVC casing on MW-5M should be repaired to allow for future monitoring at this location.
- Once the replacement of MW-3M and the repair of MW-5M are completed a round of surveying should be conducted including these wells and MW-16 which has not been surveyed.

Tables

Table 1

LABORATORY RESULTS

VOCS-DETECTED COMPOUNDS

BEDFORD VILLAGE WELLS

HUNTING RIDGE MALL

Site 360009

Sample ID	GW Std.	MW-3M							MW-3S	MW-5M				MW-5S	MW-6D
Sample Date	GV	9/16/09	10/25/10	10/25/10	1/6/11	1/6/11	3/31/11	6/28/11	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11	8/20/10	8/20/10
VOCs ug/l				Duplicate		Duplicate									
Acetone	50	**14**	<10	<10	**15.3**	**47.6**	<10	**11**	<10	<10	<10	**13**	**20**	<10	<10
cis-1,2-Dichloroethene	5	**19**	**26**	**26**	**48.1**	**44.5**	**40**	**41**	<5	< 5	<5	<5	<5	<5	<5
Methyl tert-butyl ether	10	<5	< 5	< 5	<5	<5	<5	<5	<5	< 5	<5	<5	<5	<5	**13**
Methylene chloride	5	<5	< 5	< 5	<5	**8.6**	<5	<5	<5	< 5	**9.2**	<5	<5	<5	<5
Tetrachloroethene	5	**120**	**120**	**120**	**96.3**	**90.7**	**93**	**89**	<5	< 5	<5	<5	<5	<5	<5
Trichloroethene	5	**15**	**14**	**14**	**17.7**	**16.3**	**21**	**19**	<5	< 5	<5	<5	<5	<5	<5

Sample ID	GW Std.	MW-6M						MW-6S					MW-12				
Sample Date	GV	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11	6/28/11	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11
VOCs ug/l							Duplicate										
Acetone	50	<10	<10	<10	**31**	**24**	**26**	<10	<10	<10	<10	**16**	<10	<10	<10	**28**	**19**
cis-1,2-Dichloroethene	5	<5	< 5	<5	<5	<5	<5	<5	< 5	<5	<5	<5	<5	< 5	<5	<5	<5
Methyl tert-butyl ether	10	<5	< 5	<5	<5	<5	<5	<5	< 5	<5	<5	<5	<5	< 5	<5	<5	<5
Methylene chloride	5	<5	< 5	**8.5**	<5	<5	<5	<5	< 5	**9.0**	<5	<5	<5	< 5	**9.5**	<5	<5
Tetrachloroethene	5	<5	< 5	<5	<5	<5	<5	<5	< 5	<5	<5	<5	<5	< 5	<5	<5	<5
Trichloroethene	5	<5	< 5	<5	<5	<5	<5	<5	< 5	<5	<5	<5	<5	< 5	<5	<5	<5

Sample ID	GW Std.	MW-14								MW-15						MW-16				
Sample Date	GV	9/16/09	9/16/09	8/19/10	10/25/10	1/6/11	3/31/11	3/31/11	6/28/11	9/16/09	8/19/10	10/25/10	1/6/11	3/31/11	6/28/11	8/19/10	10/25/10	1/6/11	3/31/11	6/28/11
VOCs ug/l			Duplicate					Duplicate												
Acetone	50	**12**	<10	<10	<10	**11.8**	**13**	**13**	**19**	**14**	<10	<10	<10	**14**	**18**	<10	<10	**14**	**19**	**16**
cis-1,2-Dichloroethene	5	<5	<5	<5	< 5	**15**	**22**	**23**	**12**	<5	<5	< 5	<5	<5	<5	**10**	**10**	**6.4**	**6.1**	**7.2**
Methyl tert-butyl ether	10	<5	<5	<5	< 5	<5	<5	<5	<5	<5	<5	< 5	<5	<5	<5	<5	< 5	<5	<5	<5
Methylene chloride	5	<5	<5	<5	< 5	<5	<5	<5	<5	<5	<5	< 5	<5	<5	<5	<5	< 5	<5	<5	<5
Tetrachloroethene	5	**7.1**	**5.8**	**8.2**	< 5	**6.4**	**45**	**46**	**23**	<5	<5	< 5	<5	<5	<5	**40**	**9.6**	**20.7**	**19**	**12**
Trichloroethene	5	<5	<5	<5	< 5	<5	**11**	**11**	**5.3**	<5	<5	< 5	<5	<5	<5	<5	< 5	<5	<5	<5

NOTES:

1. GW Std: NYS Ambient Water Quality Standards and Guidance Values (TOGS 1.1.1, June 1998 with April 2000 and June 2004 Addendums) for groundwater (GA).
2. GV - designates a Guidance Value.
3. Bold font designates detected result.
4. Shaded cells indicate detections above the standard or guidance value.

Table 2

Laboratory Results- METALS

GROUNDWATER SAMPLING RESULTS

BEDFORD VILLAGE WELLS

HUNTING RIDGE MALL

Site 360009

Sample ID	GW Std.	MW-3M		MW-3S	MW-5M	MW-5S	MW-6D	MW-6M		MW-6S		MW-12		MW-14			MW-15			MW-16	
Sample Date	**GV**	9/16/09	6/28/11	8/20/10	6/28/11	8/20/10	8/20/10	8/20/10	6/28/11	8/20/10	6/28/11	8/20/10	6/28/11	9/16/09	8/19/10	6/28/11	9/16/09	8/19/10	6/28/11	8/19/10	6/28/11
Metals mg/l																					
Aluminum	NS	< 0.100	<0.1	<0.1	**0.545**	<0.1	<0.1	<0.1	<0.1	<0.1	**0.398**	<0.1	<0.1	**0.178**	**1.85**	<0.1	**0.155**	<0.1	**73.7**	**0.293**	**3.82**
Antimony	3	< 0.060	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	< 0.060	<0.06	<0.06	< 0.060	<0.06	<0.06	<0.06	<0.06
Arsenic	25	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Barium	1	**0.123**	**0.099**	**0.292**	**0.125**	**0.049**	**0.022**	**0.116**	**0.139**	**0.105**	**0.101**	**0.089**	**0.098**	**0.157**	**0.29**	**0.1**	**0.252**	**0.283**	**0.933**	**0.165**	**0.125**
Beryllium	3	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Cadmium	5	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Calcium	NS	**56.3**	**61.7**	**132**	**47**	**21.1**	**69**	**57.3**	**69**	**46.6**	**41.3**	**58.3**	**72.6**	**115**	**103**	**82.8**	**89.5**	**83.5**	**84.9**	**79.7**	**64.1**
Chromium	0.05	< 0.005	<0.005	<0.005	**0.056**	**0.79**	<0.005	**0.023**	**0.038**	**0.092**	**0.486**	**0.029**	<0.005	< 0.005	**0.008**	<0.005	< 0.005	<0.005	**0.134**	<0.005	**0.007**
Cobalt	NS	< 0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.050	<0.05	<0.05	< 0.050	<0.05	**0.07**	<0.05	<0.05
Copper	200	< 0.005	<0.005	<0.005	**0.005**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.008**	<0.005	<0.005	< 0.005	<0.005	<0.005	< 0.005	<0.005	**0.143**	<0.005	**0.009**
Iron	0.3	**0.121**	**0.176**	<0.05	**2.2**	**2.12**	**2.63**	**0.131**	**0.412**	**0.45**	**3.73**	**0.589**	**0.074**	**0.290**	**0.393**	**0.116**	**4.62**	**6.31**	**152**	**0.328**	**7.22**
Lead	25	< 0.005	**0.018**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Magnesium	35 (GV)	**16**	**21.7**	**25.9**	**11.8**	**4.78**	**11.9**	**16.2**	**21.3**	**13.6**	**12.8**	**15.9**	**19.9**	**23.3**	**17.7**	**15.6**	**20.7**	**15.5**	**48**	**12.3**	**15.9**
Manganese	0.3	**0.329**	**0.284**	**0.033**	**0.102**	<0.02	**0.344**	<0.02	<0.02	<0.02	**0.066**	<0.02	<0.02	**1.05**	**0.992**	**0.437**	**15.8**	**13.8**	**14.5**	**0.625**	**1.35**
Nickel	0.1	< 0.020	<0.02	<0.02	**0.032**	**0.044**	<0.02	**0.112**	**0.057**	**0.059**	**0.036**	**0.061**	**0.048**	< 0.020	<0.02	<0.02	< 0.020	<0.02	**0.099**	<0.02	<0.02
Potassium	NS	**6.21**	**5.79**	**3.85**	**6.51**	**1.46**	**8.31**	**2.59**	**4.3**	**1.92**	**2.55**	**5.19**	**6.67**	**10.9**	**7.35**	**9.52**	**20.7**	**15**	**35.6**	**10.2**	**10.1**
Selenium	0.01	< 0.005	<0.005	**0.006**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Silver	50	< 0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.010	<0.01	<0.01	< 0.010	<0.01	<0.01	<0.01	<0.01
Sodium	20	**16.7**	**11.8**	**47**	**96.7**	**15.6**	**7.02**	**29.2**	**102**	**29.8**	**81.4**	**9.14**	**17.6**	**135**	**48**	**137**	**151**	**54.5**	**124**	**25.2**	**21.6**
Thallium	0.0005 (GV)	**0.018**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.029**	<0.01	<0.01	**0.08**	**0.022**	<0.01	<0.01	<0.01
Vanadium	NS	< 0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.020	<0.02	<0.02	< 0.020	<0.02	**0.247**	<0.02	**0.022**
Zinc	5 (GV)	**0.017**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.010	<0.01	<0.01	< 0.010	<0.01	**0.262**	<0.01	**0.02**
Mercury	0.7	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Iron, Dissolved	0.3	< 0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.050	<0.05	Not Collected	**0.094**	**0.229**	**0.341**	<0.05	<0.05
Manganese, Dissolved	0.3	**0.24**	**0.272**	**0.028**	<0.02	<0.02	**0.292**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.968**	**0.414**	Not Collected	**15.5**	**13.8**	**13.1**	**0.039**	**1.2**

NOTES:

1. GW Std: NYS Ambient Water Quality Standards and Guidance Values (TOGS 1.1.1, June 1998 with April 2000 and June 2004 Addendums) for groundwater (GA).
2. GV - designates a Guidance Value.
3. NS - designates no groundwater Standard or Guidance Value listed for this compound.
4. Bold font designates detected result.
5. Shaded cells indicate detections above the standard or guidance value.

Table 3

FIELD PARAMETERS

BEDFORD VILLAGE WELLS

HUNTING RIDGE MALL

Site 360009

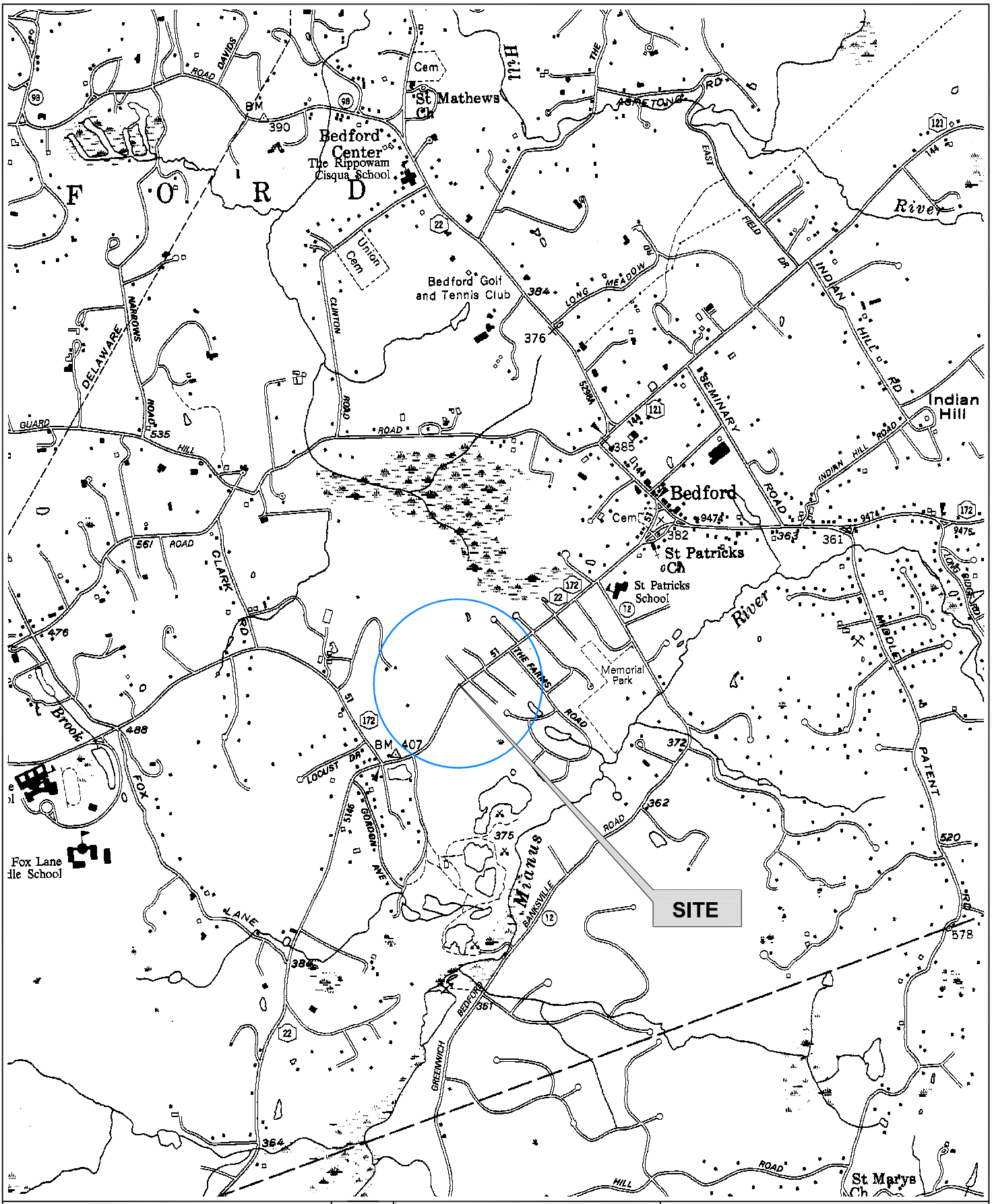
Sample ID	GW Std.	MW-3M					MW-3S	MW-5M				MW-5S	MW-6D				
Sample Date	**GV**	9/16/09	10/25/10	1/6/11	3/31/11	6/28/11	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11	8/20/10	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11
Field Parameters																	
Temperature	°C	15.55	14.24	14.3	14.07	16.48	14.29	No Readings	10.08	10.43	12.09	11.78	14.22	11.46	10.42	10.66	12.22
Conductivity	ms/cm[c]	0.504	0.452	0.607	0.658	0.343	2.25		0.966	0.819	0.588	0.334	0.572	0.963	0.444	0.490	0.272
Dissolved Oxygen	mg/L	0.59	171.2*	0.34	0.46	8.45	0.42		4.82	5.75	15.89	10.08	4.97	422.0*	5.18	3.59	10.31
Oxidation Reduction Potential	MeV	35.3	-123.6	-257.9	-210.4	4	175		144.8	-180.1	160	106	-30	32.0	44.3	-264.8	117
pH	pH Unit	7.32	7.7	7.88	7.38	7.86	5.77		7.4	7.16	7.68	5.99	6.88	6.49	7.86	8.30	8.00

Sample ID	GW Std.	MW-6M					MW-6S					MW-12				
Sample Date	**GV**	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11	8/20/10	10/25/10	1/6/11	3/31/11	6/28/11
Field Parameters																
Temperature	°C	17.55	11.58	10.72	10.65	12.98	11.62	11.54	10.16	9.97	12.05	12.86	12.00	11.19	11.31	13.41
Conductivity	ms/cm[c]	0.999	0.978	0.989	1.226	0.706	0.923	1.244	1.232	0.011	0.444	0.020	0.930	0.599	0.697	0.372
Dissolved Oxygen	mg/L	2.3	388.5*	1.98	8.98	13.06	1.57	976*	4.07	12.53	11.82	0	972.3*	3.46	2.48	10.29
Oxidation Reduction Potential	MeV	97	41.4	105.6	-206.0	88	81	112.3	48.3	-207.5	94	28	203.1	160.1	-212.9	39
pH	pH Unit	6.62	6.47	7.23	6.93	6.48	6.28	6.52	6.74	7.47	6.64	7.72	6.49	7.54	7.42	7.31

Sample ID	GW Std.	MW-14							MW-15						MW-16				
Sample Date	**GV**	9/16/09	9/16/09	8/19/10	10/25/10	1/6/11	3/31/11	6/28/11	9/16/09	8/19/10	10/25/10	1/6/11	3/31/11	6/28/11	8/19/10	10/25/10	1/6/11	3/31/11	6/28/11
Field Parameters																			
Temperature	°C	17.91	Duplicate Sample	17.12	17.58	16.66	14.34	16.98	15.78	16.54	18.64	15.86	13.04	15.30	15.34	17.44	13.93	13.57	16.31
Conductivity	ms/cm[c]	1.388		1.14	1.927	1.483	1.607	0.858	1.488	0	1.767	1.601	1.496	0.988	0.573	0.426	0.511	0.607	0.309
Dissolved Oxygen	mg/L	2.58		2.01	134.2*	1.83	3.78	6.62	1.28	10.31	121.6*	2.26	0.75	8.86	3.51	117*	1.05	0.09	8.52
Oxidation Reduction Potential	MeV	106.0		15.6	-96.7	77.1	-182.4	143	-40.7	111	-185.0	-138.4	-212.8	-44	-8	-133.6	23.5	-229.5	-89
pH	pH Unit	5.98		6.3	6.71	6.99	6.42	6.46	6.44	5	6.66	6.87	6.52	6.74	8.94	8.03	9.27	7.32	7.65

* - Measurement unit is percentage.

Figures



MAP REFERENCE:

DOT 7.5 MINUTE QUADRANGLE, MOUNT KISCO SERIES

0' 2000' 4000'

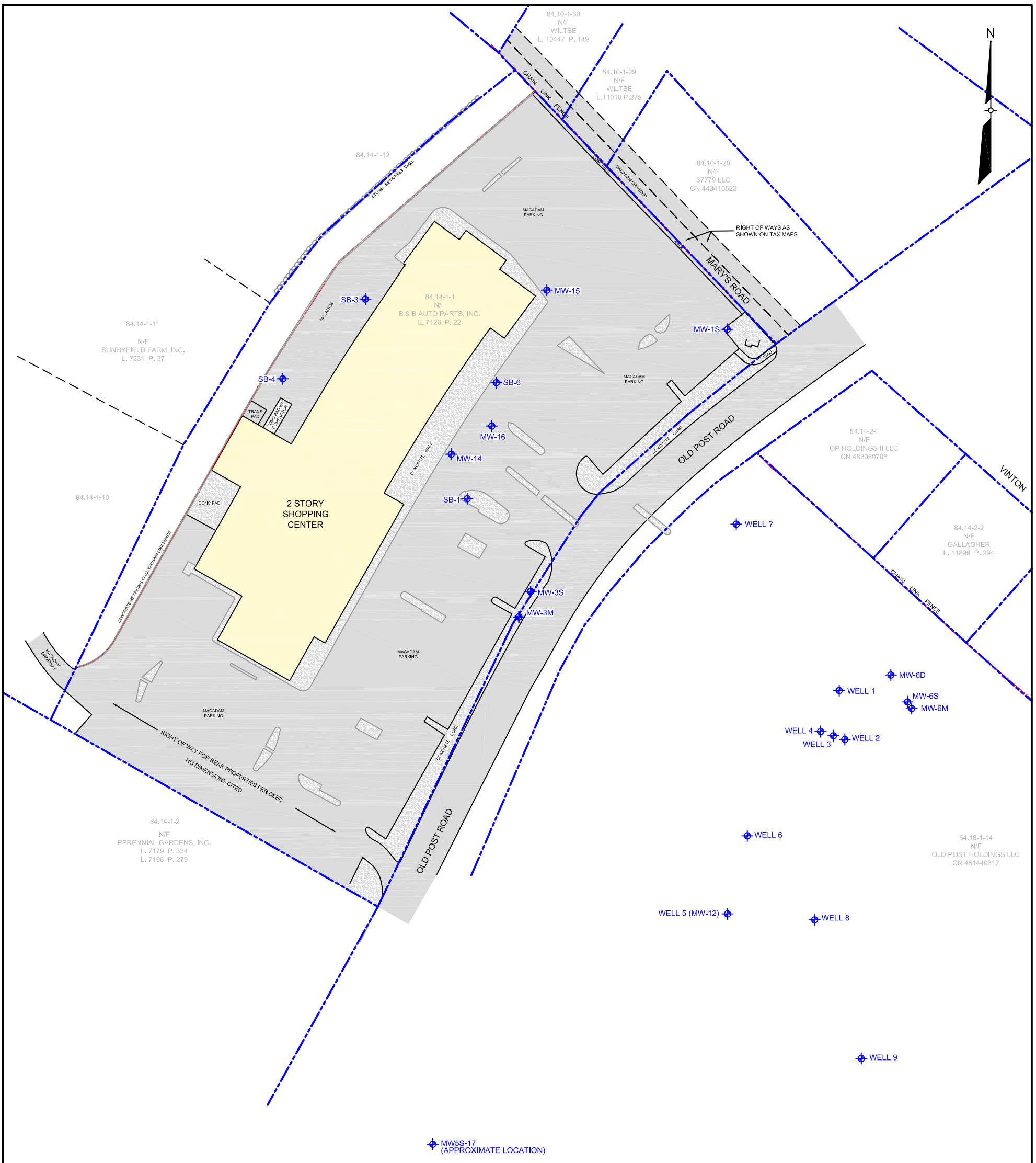
JANUARY 2010 SCALE 78829

N

AECOM

Figure 1
SITE LOCATION MAP

Bedford Village Wells
Hunting Ridge Mall Site
Bedford, New York



LEGEND:

- MW-14/SB-2 — SOIL BORING/MONITORING WELL LOCATION
- 40 — VOC CONCENTRATION CONTOUR LINE
- PROPERTY BOUNDARY
- BUILDING
- PAVED AREA
- CONCRETE AREA

0 40 80 160

SCALE IN FEET

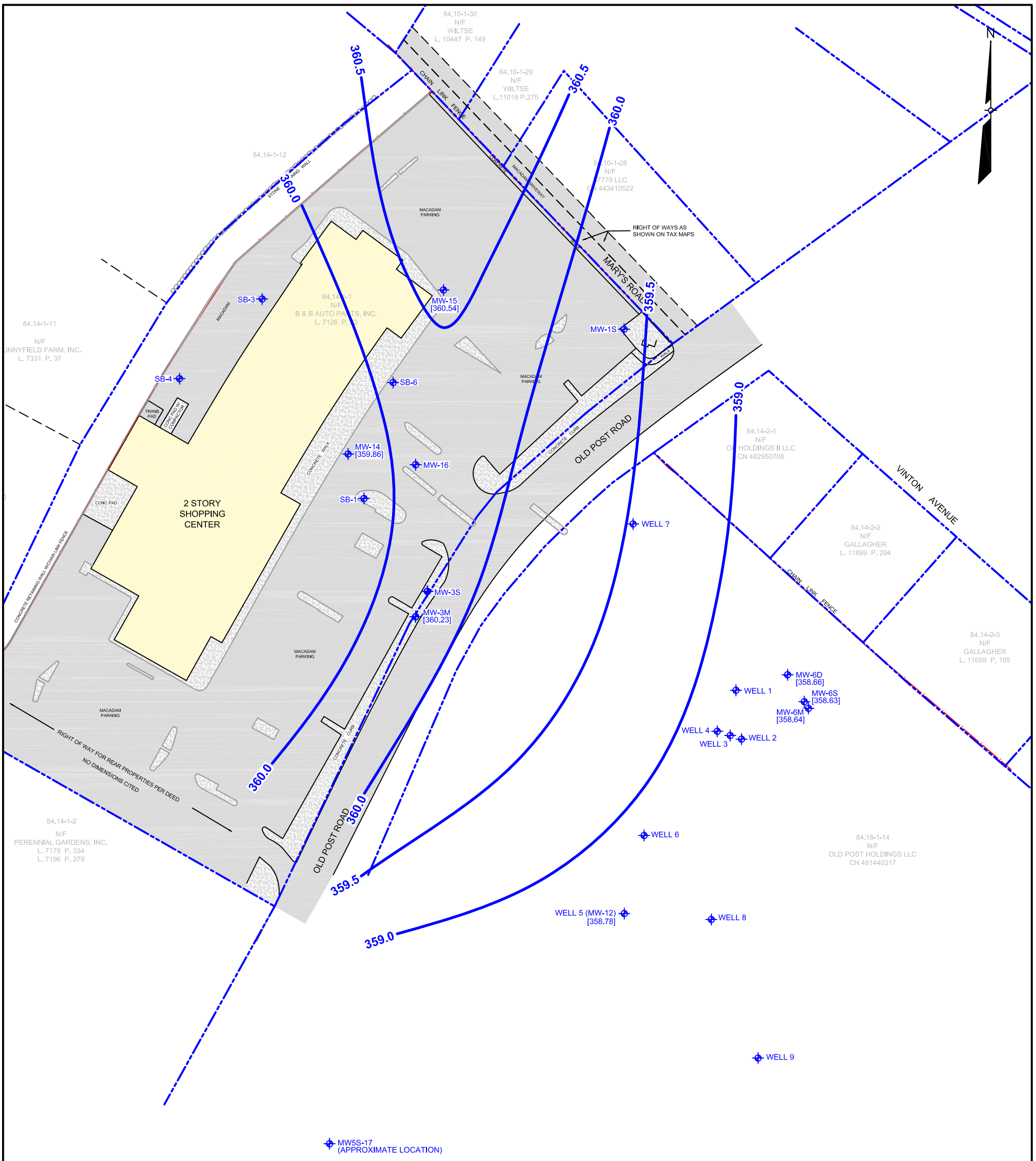
AECOM
40 British American Blvd.
Latham, NY 12110
T: (518) 951-2200 F: (518) 951-2300
www.aecom.com

FIGURE 2
SITE FEATURES

BEDFORD VILLAGE HUNTING RIDGE MALL
SITE NO. 360009

SEPTEMBER 2011 60133923

SOURCE:
SURVEY COMPLETED BY YEC, INC. DATE OF FIELD SURVEY JANUARY 12, 2009. PROPERTY LINES SHOWN ARE APPROXIMATE ONLY FROM TAX MAP INFORMATION AND ARE NOT CERTIFIED. PROPERTY OWNERS NAMES AND DEED REFERENCES FROM TOWN OF BEDFORD TAX ASSESSMENT ROLES.



LEGEND:

- MW-14/SB-2 — SOIL BORING/MONITORING WELL LOCATION
- * — ANOMALOUS ELEVATION
- 359.0 — GROUNDWATER ELEVATION CONTOUR LINE
- PROPERTY BOUNDARY
- BUILDING
- PAVED AREA
- CONCRETE AREA

0 40 80 160

SCALE IN FEET

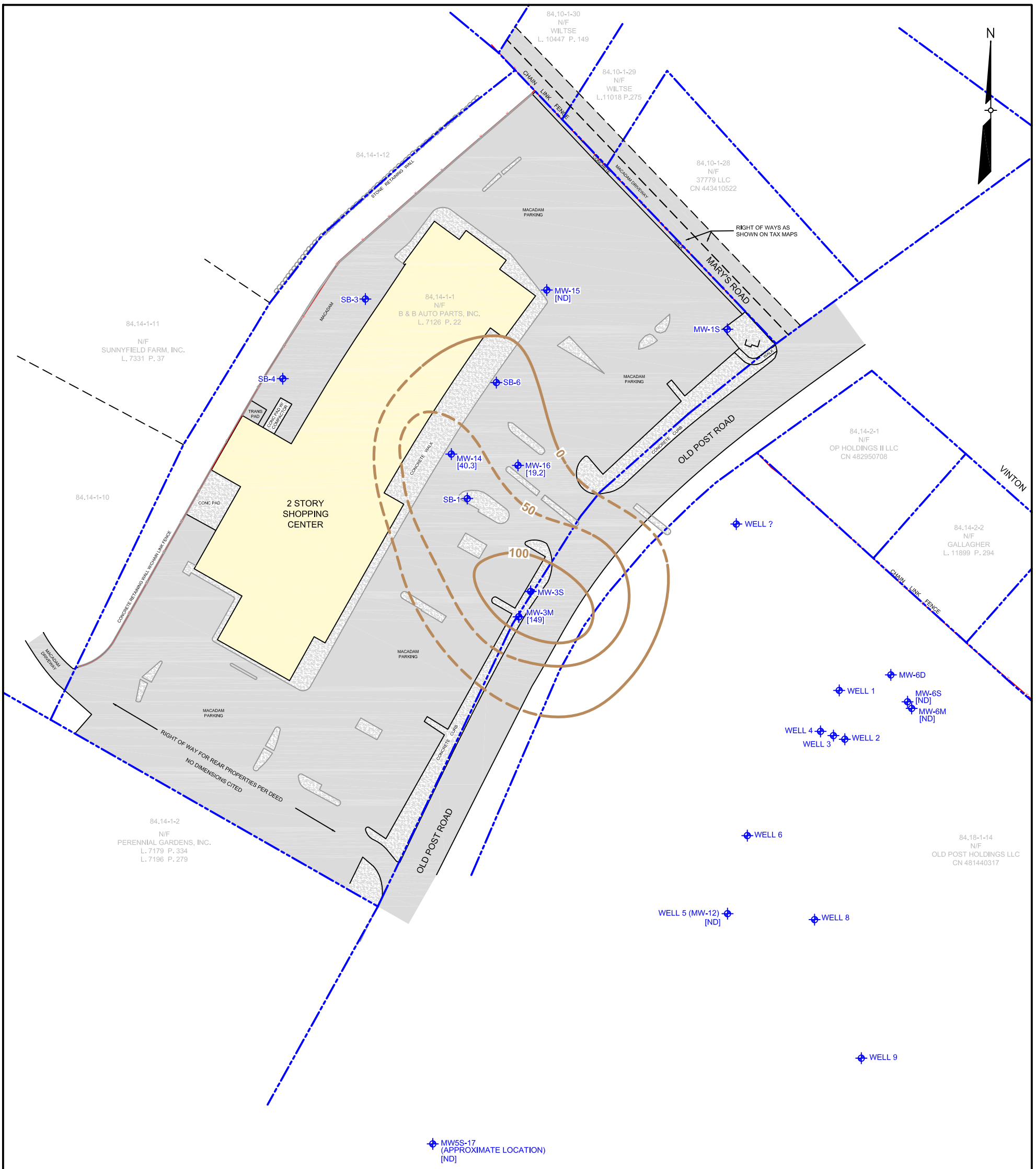
SOURCE:
SURVEY COMPLETED BY YEC, INC. DATE OF FIELD SURVEY JANUARY 12, 2009. PROPERTY LINES SHOWN ARE APPROXIMATE ONLY FROM TAX MAP INFORMATION AND ARE NOT CERTIFIED. PROPERTY OWNERS NAMES AND DEED REFERENCES FROM TOWN OF BEDFORD TAX ASSESSMENT ROLES.

AECOM
40 British American Blvd.
Latham, NY 12110
T: (518) 951-2200 F: (518) 951-2300
www.aecom.com

FIGURE 3
GROUNDWATER ISOELEVATION MAP
JUNE 2011

BEDFORD VILLAGE HUNTING RIDGE MALL
SITE NO. 360009

SEPTEMBER 2011 60133923



LEGEND:

- MW-14/SB-2 — SOIL BORING/MONITORING WELL LOCATION
- 50 — CVOC CONCENTRATION CONTOUR LINE (JUNE 2011) (DASHED WHERE INFERRED)
- PROPERTY BOUNDARY
- [ND] — NON DETECT
- BUILDING
- PAVED AREA
- CONCRETE AREA

0 40 80 160

SCALE IN FEET

SOURCE:
SURVEY COMPLETED BY YEC, INC. DATE OF FIELD SURVEY JANUARY 12, 2009. PROPERTY LINES SHOWN ARE APPROXIMATE ONLY FROM TAX MAP INFORMATION AND ARE NOT CERTIFIED. PROPERTY OWNERS NAMES AND DEED REFERENCES FROM TOWN OF BEDFORD TAX ASSESSMENT ROLES.

AECOM
40 British American Blvd.
Latham, NY 12110
T: (518) 951-2200 F: (518) 951-2300
www.aecom.com

FIGURE 4
CVOC PLUME MAP
JUNE 2011

BEDFORD VILLAGE HUNTING RIDGE MALL
SITE NO. 360009

SEPTEMBER 2011 60133923

FIGURE 5
CHLORINATED VOC TRENDS
MW-3M

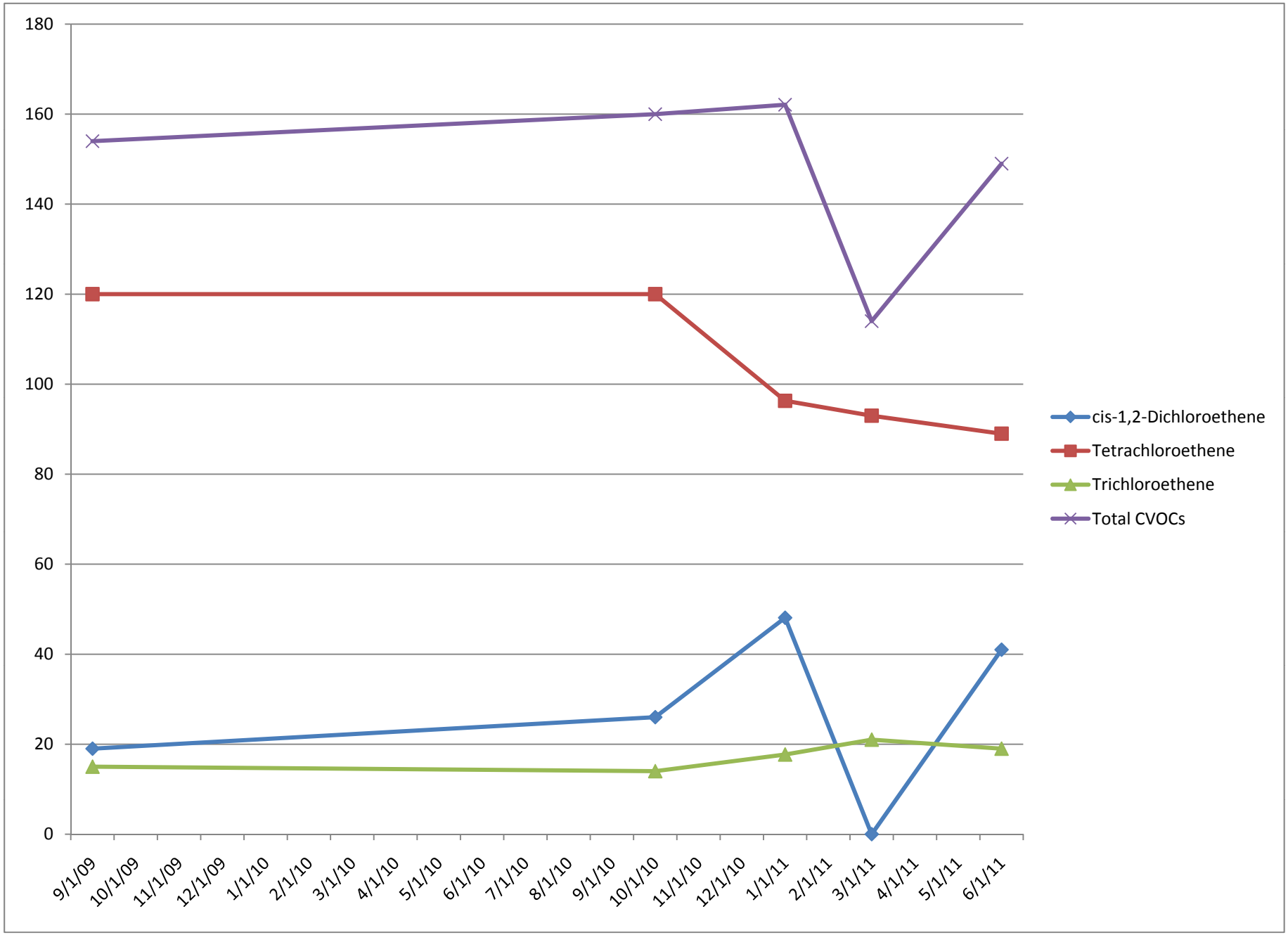


FIGURE 6
CHLORINATED VOC TRENDS
MW-14

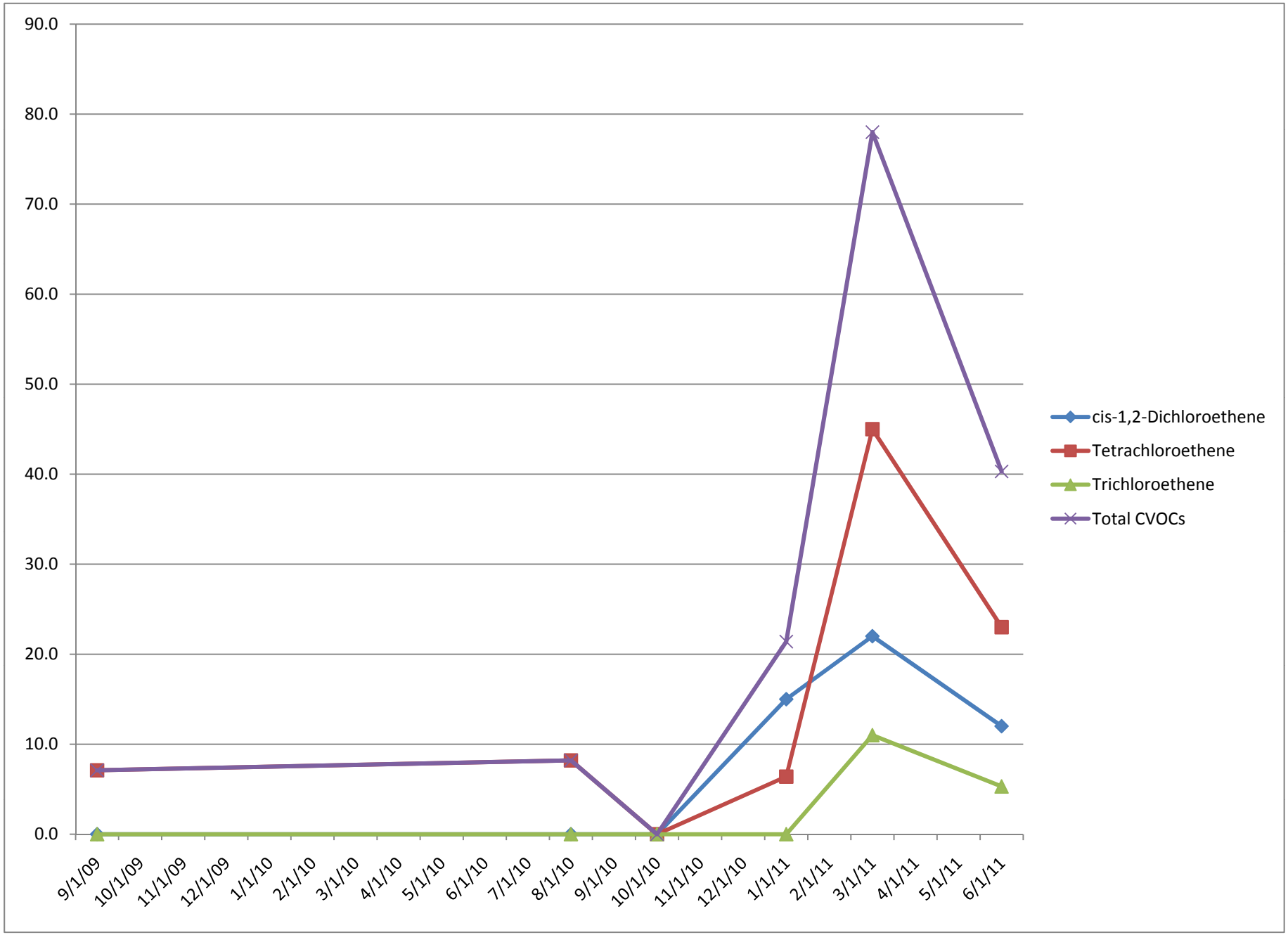
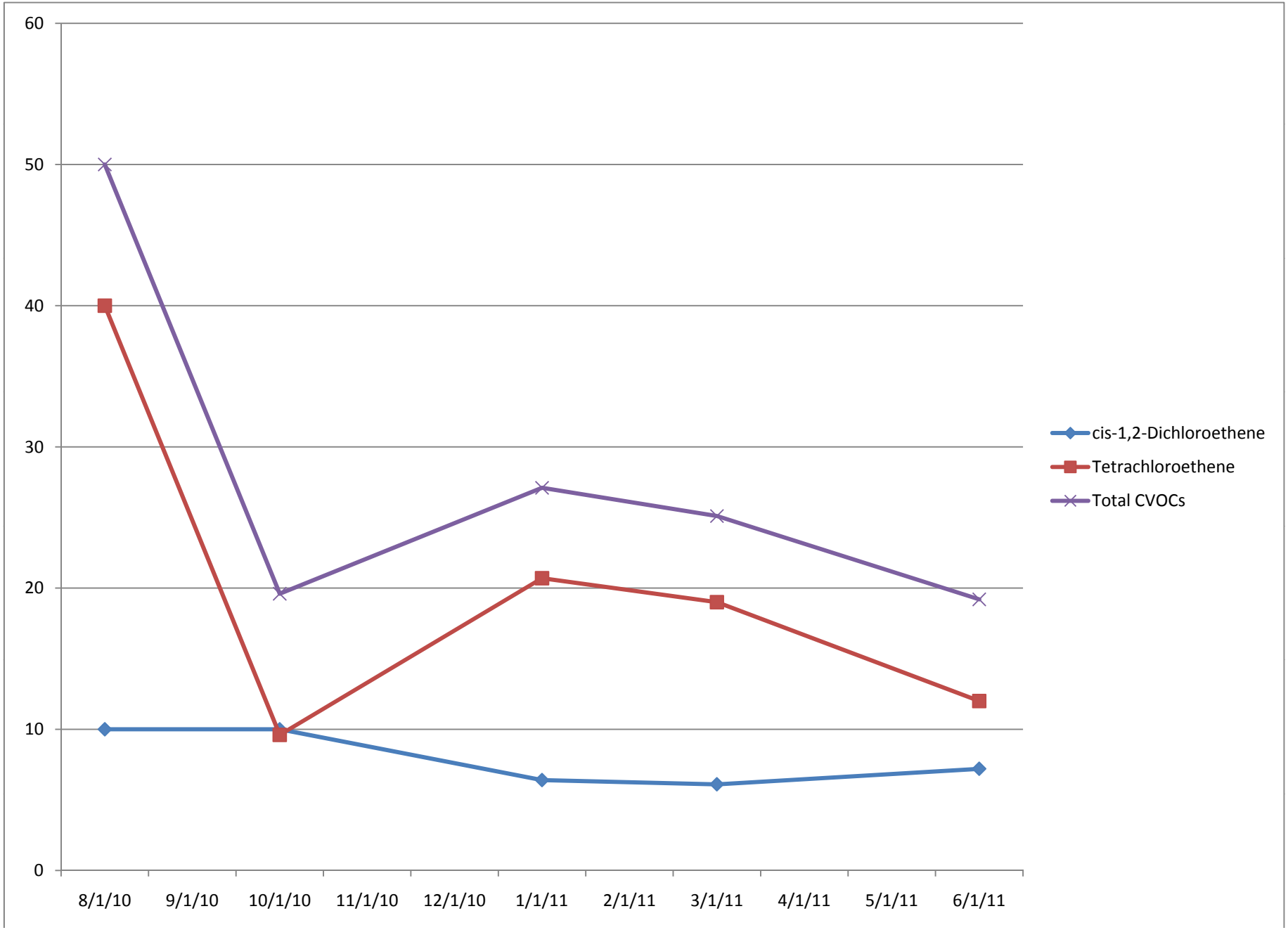


FIGURE 7
CHLORINATED VOC TRENDS
MW-16



Appendix A

Field Sampling Forms

SITE NAME: _____ SITE ID.: BVW

MONITORING WELL FIELD INSPECTION LOG

INSPECTOR: GLW
DATE/TIME: 6/28/11
WEll ID.: MW-12

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	

WELL COORDINATES? NYTM X_____ NYTM Y_____
PDOP Reading from Trimble Pathfinder:_____ Satelites:_____
GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back). Figure says Well-5	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: .....

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED.....
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): stickup
PROTECTIVE CASING MATERIAL TYPE: steel
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): .....

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 63.34
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 30.31
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: .....
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE .....
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES.....

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.
In woods - service road in woods - entrance unknown

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.
In woods

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:

Sketch

SITE NAME: _____ SITE ID.: BVW

MONITORING WELL FIELD INSPECTION LOG

INSPECTOR: GLW
DATE/TIME: 6/28/11
WEll ID.: MW-16D

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	

WELL COORDINATES? NYTM X_____ NYTM Y_____
PDOP Reading from Trimble Pathfinder:_____ Satelites:_____
GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: .....

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	top stuck open	

HEADSPACE READING (ppm) AND INSTRUMENT USED.....
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): stick up
PROTECTIVE CASING MATERIAL TYPE: steel
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): .....

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): .....
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 28.63
MEASURE WELL DIAMETER (Inches): .....
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE .....
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES.....

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.
In Woods - service road nearby but entrance unknown

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.
In woods

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:

Sketch

SITE NAME: _____ SITE ID.: _____

INSPECTOR: _____

MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: 6/28/11

WELL ID.: MW-15

	YES	NO
WELL VISIBLE? (If not, provide directions below)	X	

WELL COORDINATES? NYTM X_____ NYTM Y_____

PDOP Reading from Trimble Pathfinder:_____ Satelites:_____

GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	X	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	X	~~X~~

Labeled Wrong on Figure

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-15

~~Label lost~~

	YES	NO
SURFACE SEAL PRESENT?	X	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	X	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	X	

HEADSPACE READING (ppm) AND INSTRUMENT USED: _____

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Flushmount

PROTECTIVE CASING MATERIAL TYPE: Cast Iron

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 6"

	YES	NO
LOCK PRESENT?		X
LOCK FUNCTIONAL?		X
DID YOU REPLACE THE LOCK?		X
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		X
WELL MEASURING POINT VISIBLE?	X	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 27.91

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 11.16

MEASURE WELL DIAMETER (Inches): 2

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Good, in parking Lot near side walk, very busy parking Lot

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Parking Lot

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

Parked Cars, AC Discharge

REMARKS:

Sketch

SITE NAME: _____ SITE ID.: _____

INSPECTOR: _____

MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: 6/28/11

WELl ID.: MW-3M

	YES	NO
WELL VISIBLE? (If not, provide directions below)	X	

WELL COORDINATES? NYTM X_____ NYTM Y_____

PDOP Reading from Trimble Pathfinder:_____ Satelites:_____

GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	X	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	X	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-3M

	YES	NO
SURFACE SEAL PRESENT?	X	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	X	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	X	

HEADSPACE READING (ppm) AND INSTRUMENT USED.....

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) Flushmount

PROTECTIVE CASING MATERIAL TYPE: Cast Iron

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 6"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 73.62

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 14.18

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE .....

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES.....

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

By Power lines

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

on grass @ island between busy road & busy parking Lot

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

Parked Cars, Leaking Moving cars

REMARKS:

Sketch

SITE NAME: _____ SITE ID.: _____

INSPECTOR: _____

MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: 6/28/11

WELl ID.: mw-6m

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	

WELL COORDINATES? NYTM X_____ NYTM Y_____

PDOP Reading from Trimble Pathfinder:_____ Satelites:_____

GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: mw-6m

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED.....

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) 2' ~~0 Steel~~ 2' Stickup

PROTECTIVE CASING MATERIAL TYPE: Steel

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 4"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 59.93

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 30.09

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

In Woods, service Road nearby

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Woods

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

Flying Golf Balls

REMARKS:

Sketch

SITE NAME: _____ SITE ID.: BVW

INSPECTOR: GLW

MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: 6/28/11

WELL ID.: MW-6S

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	

WELL COORDINATES? NYTM X_____ NYTM Y_____

PDOP Reading from Trimble Pathfinder:_____ Satelites:_____

GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-6S

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Stickup

PROTECTIVE CASING MATERIAL TYPE: Steel

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 6

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 30.71

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 44.18

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

in woods - service road nearby but unsure of entrance

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

in woods - vegetation could be cleared out

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:

Sketch

SITE NAME:

SITE ID.: BVW
INSPECTOR: GLW
DATE/TIME: 10/28/11
WELL ID.: MW-5M

MONITORING WELL FIELD INSPECTION LOG

	YES	NO
WELL VISIBLE? (If not, provide directions below) Note that it is west of Stone Wall in woods	✓	

WELL COORDINATES? NYTM X_____ NYTM Y_____
PDOP Reading from Trimble Pathfinder:_____ Satelites:_____
GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL:

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below) no cover		✓

HEADSPACE READING (ppm) AND INSTRUMENT USED
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Stickup
PROTECTIVE CASING MATERIAL TYPE: Steel
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 69.02
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 26.37
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: [redacted] Broken at top
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.
in woods - there is a service rd in the woods - unsure of entrance though

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.
in woods - could use some clearing out

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:
Note that the well is currently covered by Blue Nitrile gloves

Sketch

SITE NAME: _____ SITE ID.: BVW

MONITORING WELL FIELD INSPECTION LOG

INSPECTOR: GLW
DATE/TIME: 6/28/11
WELL ID.: MW-14

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	

WELL COORDINATES? NYTM X_____ NYTM Y_____
PDOP Reading from Trimble Pathfinder:_____ Satelites:_____
GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back) On map it's labelled MW-10	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: .....

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED.....
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) Flushmount
PROTECTIVE CASING MATERIAL TYPE: Steel
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 4"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 26.74
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 11.91
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE .....
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES.....

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.
in a busy parking lot near curb of shopping plaza - good access

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.
parking lot

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):
vehicle discharges - storm sewer

REMARKS:
cars will park on top of it from time to time even though it's in a no parking zone

Sketch

SITE NAME:

SITE ID.: BVW
INSPECTOR: GLW
DATE/TIME: 6/28/11
WELL ID.: MW-16

MONITORING WELL FIELD INSPECTION LOG

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	

WELL COORDINATES? NYTM X_____ NYTM Y_____
PDOP Reading from Trimble Pathfinder:_____ Satelites:_____
GPS Method (circle) Trimble And/Or Magellan

	YES	NO
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL:

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): flushmount
PROTECTIVE CASING MATERIAL TYPE: steel
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 6"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		✓
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 65.69
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 11.03
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.
in a busy parking lot in the entranceway - good access

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.
in parking lot

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):
vehicle discharge - storm sewer

REMARKS:

Sketch

Monitoring Well Purging / Sampling Form

Project Name and Number:

Monitoring Well Number: MW-12 Date: 6/28/11

Samplers:

Sample Number: MW-12 QA/QC Collected? No

Purging / Sampling Method:

1. L = Well Depth:	63.34	feet
2. D = Casing Diameter (I.D.):	2"	feet
3. W = Depth to Water:	30.31	feet
4. C = Column of Water in Well:	33.03	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	5.58	gal
6. 3(V) = Target Purge Volume	16.75	gal

D (inches)	D (feet)
1-inch	0.08
(2-inch)	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using Horiba U22

Parameter	Units	Readings					
Time	24 hr	1807	~~1815~~ 1821				
Water Level (0.33)	feet	30.31	—				
Volume Purged	gal	0	16.75				
Flow Rate	mL / min	—	—				
Turbidity (+/- 10% or < 50)	NTU	44.3	67.1				
Dissolved Oxygen (+/- 10%)	%	—	—				
Dissolved Oxygen (+/- 10%)	mg/L	8.53	10.29				
Eh / ORP (+/- 10)	MeV	50	39				
Specific Conductivity	mS/cm^c						
Conductivity (+/- 3%)	µmho / cm	0.381	0.372				
pH (+/- 0.1)	pH unit	7.35	7.31				
Temp (+/- 0.5)	C	13.35	13.41				
Color	Visual	Clear SL Cloudy					
Odor	Olfactory	None	None				

Comments: Sampled VOC @ 1805
Started purge @ 1807

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: Bedford Village Wells - HRM

Monitoring Well Number: MW-6D Date: 6/28/11

Samplers:

Sample Number: MW-6D QA/QC Collected? No

Purging / Sampling Method: Bailer

1. L = Well Depth:		feet
2. D = Casing Diameter (I.D.):		feet
3. W = Depth to Water:	28.63	feet
4. C = Column of Water in Well:		feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$		gal
6. 3(V) = Target Purge Volume		gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

Parameter	Units	Readings					
Time	24 hr	1530					
Water Level (0.33)	feet	~~28~~63					
Volume Purged	gal	—					
Flow Rate	mL / min	—					
Turbidity (+/- 10% or < 50)	NTU	31.2					
Dissolved Oxygen (+/- 10%)	%	—					
Dissolved Oxygen (+/- 10%)	mg/L	10.31					
Eh / ORP (+/- 10)	MeV	117					
Specific Conductivity	mS/cm^c	—					
Conductivity (+/- 3%)	µmho / cm	0.272					
pH (+/- 0.1)	pH unit	8.00					
Temp (+/- 0.5)	C	12.22					
Color	Visual	Clear					
Odor	Olfactory	None					

Comments:

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: Bedford Village Wells - HRM

Monitoring Well Number: MW-15 Date: 6/28/11

Samplers: Mark Howard + Greta White

Sample Number: MW-15 QA/QC Collected? No

Purging / Sampling Method: PDB + Bailer / 3 Well Volumes

1. L = Well Depth:	27.77	feet
2. D = Casing Diameter (I.D.):	2"	feet
3. W = Depth to Water:	11.16	feet
4. C = Column of Water in Well:	16.61	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	2.82	gal
6. 3(V) = Target Purge Volume 6.16978	8.46	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using ~~YSI~~ Horiba U22

Parameter	Units	Readings					
Time	24 hr	1105	1125				
Water Level (0.33)	feet	–	–				
Volume Purged	gal	–	3V				
Flow Rate	mL / min	–	–				
Turbidity (+/- 10% or < 50)	NTU	316.0	+				
Dissolved Oxygen (+/- 10%)	%						
Dissolved Oxygen (+/- 10%)	mg/L	7.51	8.86				
Eh / ORP (+/- 10)	MeV	-95	-44				
Specific Conductivity	mS/cm^c						
Conductivity (+/- 3%) mS/cm	~~umho / cm~~	0.90	0.988				
pH (+/- 0.1)	pH unit	7.06	6.74				
Temp (+/- 0.5)	C	18.07	15.30				
Color	Visual	Orange	lt. Br.				
Odor	Olfactory	None	organic				

Comments: Sampled ~~[illegible]~~ @1050

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: BVW - HRM

Monitoring Well Number: MW-3M Date: 6/28/11

Samplers: Mark Howard + Greta White

Sample Number: MW-3M QA/QC Collected? No

Purging / Sampling Method: ~~PDB~~ PDB + bailer 3 well Volume

			D (inches)	D (feet)
1. L = Well Depth:	73.45	feet	1-inch	0.08
2. D = Casing Diameter (I.D.):	0.17	feet	2-inch	0.17
3. W = Depth to Water:	14.18	feet	3-inch	0.25
4. C = Column of Water in Well:	59.27	feet	4-inch	0.33
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	9.66	gal	6-inch	0.50
6. 3(V) = Target Purge Volume	28.98	gal		

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using Horiba U-22

Parameter	Units	Readings					
Time	24 hr	1155	1235				
Water Level (0.33)	feet	14.18	—				
Volume Purged	gal	0	3V				
Flow Rate	mL / min	—	—				
Turbidity (+/- 10% or < 50)	NTU	42.0	33.7				
Dissolved Oxygen (+/- 10%)	%						
Dissolved Oxygen (+/- 10%)	mg/L	6.74	8.45				
Eh / ORP (+/- 10)	MeV	55	4				
Specific Conductivity	mS/cm^c	—	—				
Conductivity (+/- 3%)	µmho / cm	0.363	0.343				
pH (+/- 0.1)	pH unit	7.68	7.86				
Temp (+/- 0.5)	C	15.81	16.48				
Color	Visual	Clear	Clear				
Odor	Olfactory	None	None				

Comments: Started purge @ 1155

1150 collected MW3M-062811

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: Bedford Village Wells - HRM

Monitoring Well Number: MW-6M Date: 6/28/11

Samplers: GLW, MJH

Sample Number: MW6M-062811 QA/QC Collected? Yes - Dup
&MWDup-062811

Purging / Sampling Method: PDB & Bailer

1. L = Well Depth:	59.93	feet
2. D = Casing Diameter (I.D.):	2"	feet
3. W = Depth to Water:	30.09	feet
4. C = Column of Water in Well:	29.84	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	5.06	gal
6. 3(V) = Target Purge Volume	15.20	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using Horiba U22

Parameter	Units	Readings					
Time	24 hr	1313	1358				
Water Level (0.33)	feet	—	—				
Volume Purged	gal	—	—				
Flow Rate	mL / min	—	—				
Turbidity (+/- 10% or < 50)	NTU	46.8	28.9				
Dissolved Oxygen (+/- 10%)	%						
Dissolved Oxygen (+/- 10%)	mg/L	12.54	13.06				
Eh / ORP (+/- 10)	MeV	104	88				
Specific Conductivity	mS/cm^c						
Conductivity (+/- 3%) mS/cm ~~umho/cm~~		0.639	0.706				
pH (+/- 0.1)	pH unit	7.38	6.48				
Temp (+/- 0.5)	C	14.01	12.98				
Color	Visual	Clear	Clear				
Odor	Olfactory	None	None				

Comments: 1305 - Collect MW6M-062811 Sample & Dup.

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: Bedford Village Wells-HRM

Monitoring Well Number: MW-6S Date: 6/28/11

Samplers: GLW, MJH

Sample Number: MW6S-062811 QA/QC Collected? No

Purging / Sampling Method: PDB & Bailer

1. L = Well Depth:	30.71	feet
2. D = Casing Diameter (I.D.):	2"	feet
3. W = Depth to Water:	44.18	feet
4. C = Column of Water in Well:	13.47	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	2.29	gal
6. 3(V) = Target Purge Volume	6.86	gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using Horiba U22

Parameter	Units	Readings					
Time	24 hr	1335	1400				
Water Level (0.33)	feet	—	—				
Volume Purged	gal	—	—				
Flow Rate	mL / min	—	—				
Turbidity (+/- 10% or < 50)	NTU	173.0	68.5				
Dissolved Oxygen (+/- 10%)	%						
Dissolved Oxygen (+/- 10%)	mg/L	12.07	11.82				
Eh / ORP (+/- 10)	MeV	64	94				
Specific Conductivity	mS/cm^c						
Conductivity (+/- 3%) mS/cm	µmho / cm	0.466	0.444				
pH (+/- 0.1)	pH unit	6.71	6.64				
Temp (+/- 0.5)	C	13.26	12.05				
Color	Visual	Clear	Clear				
Odor	Olfactory	None	None				

Comments:

1330 Collect MW6S-062811

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: BVW - HRM

Monitoring Well Number: MW-5M Date: 6/28/11

Samplers: Matt Howard + Greta White

Sample Number: MW-5M QA/QC Collected? No

Purging / Sampling Method: PDB + Bailer / 3 well Volumes

1. L = Well Depth:	69.02	feet	
2. D = Casing Diameter (I.D.):	0.17	feet	
3. W = Depth to Water:	26.37	feet	
4. C = Column of Water in Well:	42.65	feet	
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	6.95	gal	
6. 3(V) = Target Purge Volume	20.86	gal	

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

Parameter	Units	Readings					
Time	24 hr	1520	1605				
Water Level (0.33)	feet						
Volume Purged	gal						
Flow Rate	mL / min						
Turbidity (+/- 10% or < 50)	NTU	62.0	72.8				
Dissolved Oxygen (+/- 10%)	%						
Dissolved Oxygen (+/- 10%)	mg/L	14.53	15.89				
Eh / ORP (+/- 10)	MeV	145.0	160				
Specific Conductivity	mS/cm^c						
Conductivity (+/- 3%)	µmho / cm	0.566	0.588				
pH (+/- 0.1)	pH unit	7.15	7.68				
Temp (+/- 0.5)	C	12.16	12.09				
Color	Visual	~~Clear~~ SIA	~~Clear~~ SIA				
Odor	Olfactory	None	None				

Comments:

Started purge @ 1520

Sampled VOC @ 1575

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: Bedford Village Wells - HRM

Monitoring Well Number: MW-14 Date: 6/28/11

Samplers: GLW, MJH

Sample Number: MW14-062811 QA/QC Collected? No

Purging / Sampling Method: PDB & Bailer

1. L = Well Depth:	26.74	feet
2. D = Casing Diameter (I.D.):	2"	feet
3. W = Depth to Water:	11.91	feet
4. C = Column of Water in Well:	14.83	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	2.5	gal
6. 3(V) = Target Purge Volume	7.5	gal

D (inches)	D (feet)
1-inch	0.08
~~2-inch~~	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using Horiba U22

Parameter	Units	Readings					
Time	24 hr	1645	1705				
Water Level (0.33)	feet	—	—				
Volume Purged	gal	—	3V				
Flow Rate	mL / min	—	—				
Turbidity (+/- 10% or < 50)	NTU	151.0	+				
Dissolved Oxygen (+/- 10%)	%						
Dissolved Oxygen (+/- 10%)	mg/L	8.35	10.62				
Eh / ORP (+/- 10)	MeV	152	143				
Specific Conductivity	mS/cm^c						
Conductivity (+/- 3%) mS/cm	~~µmho / cm~~	0.97	0.858				
pH (+/- 0.1)	pH unit	7.07	6.46				
Temp (+/- 0.5)	C	17.37	16.98				
Color	Visual	Clear,	Cloudy Tan				
Odor	Olfactory	None	None				

Comments:

1640- Collect MW14-062811

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging / Sampling Form

Project Name and Number: Bedford Village Wells - HRM

Monitoring Well Number: MW-16 Date: 6/28/11

Samplers: GLW, MJH

Sample Number: MW-16 QA/QC Collected? No

Purging / Sampling Method: PDB; ~~Bailer~~ Whale

1. L = Well Depth:	65.69	feet
2. D = Casing Diameter (I.D.):	0.17	feet
3. W = Depth to Water:	11.03	feet
4. C = Column of Water in Well:	54.66	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	8.91	gal
6. 3(V) = Target Purge Volume	26.73	gal

D (inches)	D (feet)
~~1-inch~~	~~0.08~~
~~2-inch~~	~~0.17~~
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using Horiba U22

Parameter	Units	Readings					
Time	24 hr	1730	1750				
Water Level (0.33)	feet	11.03	—				
Volume Purged	gal	0	~27				
Flow Rate	mL / min	—	—				
Turbidity (+/- 10% or < 50)	NTU	94.0	160.0				
Dissolved Oxygen (+/- 10%)	%	—	—				
Dissolved Oxygen (+/- 10%)	mg/L	6.48	5.52				
Eh / ORP (+/- 10)	MeV	-120	-89				
Specific Conductivity	mS/cm^c	—	—				
Conductivity (+/- 3%)	µmho / cm	0.359	0.309				
pH (+/- 0.1)	pH unit	7.63	7.65				
Temp (+/- 0.5)	C	16.92	16.31				
Color	Visual	Cloudy	Cloudy				
Odor	Olfactory	Sulfur	Sulfur				

Comments: Start of purge @ 1730

1730 - Collect Sample MW16-062811

* Three consecutive readings within range indicates stabilization of that parameter.