

Waite - Heindel
Environmental Management

March 20, 2015

Mr. Gerold Noyes, P.E.
Vermont Department of Environmental Conservation
Waste Management Division
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704

RE: 2014 Annual Monitoring Report
Bressett Site, Randolph, Vermont (Site #87-0009 / 77-0019)

Dear Gerold:

Waite-Heindel Environmental Management (WHEM) is pleased to present the *2014 Annual Monitoring Report* for the Bressett Site in Randolph, Vermont. The report provides details and results of the October 2014 (4th Quarter) sampling event, and summarizes the results from the 1st, 2nd, and 3rd Quarter events. This report has been prepared in accordance with the requirements and conditions described in the *State of Vermont Contract for Personal Services EC13-04*.

A digital copy (*.PDF) of the report has been uploaded to the VT DEC's FTP site.

Do not hesitate to contact us if you have any questions about the report or the work conducted. Please contact Christopher Page at cpage@waiteenv.com or myself at mwaite@waiteenv.com.

Sincerely,

A handwritten signature in black ink that reads "Miles E. Waite".

Miles E. Waite, Ph.D., P.G.
Senior Hydrogeologist

A handwritten signature in black ink that reads "Chris Page".

Christopher M. Page
Staff Scientist

Enclosure

2014 ANNUAL MONITORING REPORT

for the

BRESSETT SITE RANDOLPH, VERMONT

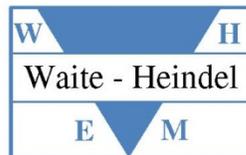
VT DEC Site #87-0009 / 77-0019

March 20, 2015

Prepared for:

STATE OF VERMONT
Vermont Department of Environmental Conservation
Waste Management Division
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704

Prepared by:



Waite - Heindel
Environmental Management

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1.0 INTRODUCTION

The following *2014 Annual Monitoring Report* for the Bressett Site in Randolph, Vermont (see attached Site Location Map in Appendix A) was prepared by Waite-Heindel Environmental Management, LLC (WHEM) for the Vermont Department of Environmental Conservation (VT DEC). This report has been completed in accordance with Waite Environmental Management's (WHEM) contract with State of Vermont (contract EC13-04) for environmental monitoring.

This report includes discussion of the results of groundwater, drinking water and surface water sampling conducted in 2014. Monitoring locations were in the vicinity of the former Bressett Residence, Vermont Route 12, and Town Road #23. Events covered in this report include:

- Sampling of thirteen (13) groundwater monitoring wells in October 2014.
- Sampling of one (1) active private water well in April and October 2014.
- Sampling of two (2) surface water sampling points in July 2014.

Monitoring at these locations was conducted in accordance with Waite-Heindel Environmental Management's (WHEM) *Work Plan for Environmental Monitoring* ("Work Plan") [1], the *Field/Lab Coordination Memorandum for Water Monitoring* ("FLCM-Water") [2], and the *Field/Lab Coordination Memorandum for Air Monitoring* ("FLCM-Air") [3].

All results except those from October (4th Quarter) 2014, which are discussed in this report, have been previously reported by WHEM [4, 5].

2.0 GROUNDWATER SAMPLING

Groundwater monitoring well sampling was conducted by WHEM from a total of thirteen (13) wells on October 20-21, 2014. Wells sampled included six paired monitoring wells (MW-3S/D, MW4-S/D, MW-101S, MW-102S/D, MW-3RD, MW-104S/D) and three bedrock monitoring wells (BRW-1, BRW-2, BRW-3). In addition, groundwater elevation measurement was conducted on two (2) wells (MW-1 and MW-2S). All wells are in the general vicinity of the former Bressett residence, as shown in the Site Plan in Appendix A.

Sampling was conducted in accordance with site protocols as specified in WHEM's Work Plan and the FLCM-Water, with the exception of wells MW-101D and MW-103RS October 2014. MW-103RS contained insufficient water for sampling, as has occurred in the past. MW-103RS and MW-103RD were installed in October 2011 to replace buried wells MW-103S and MW-103D. MW-101D, which is typically sampled without issue and tends to contain the highest target VOC concentrations of the sample group, was destroyed or buried sometime prior to the October 2014 groundwater sampling event and could not be sampled. This well will be replaced during 2014.

Details and results of the sampling events are described below.

2.1 Groundwater Level Measurement

Prior to sampling, the water level in each well was measured with a water level probe. Using top-of-casing elevation data, the measurements were converted into groundwater elevations. Elevation data from October 2014 are shown with historical measurements in Table 1.1 in Appendix B. These data indicate the following:

- The October 2014 average elevation (all wells) was 0.06 feet higher than the October 2013 average elevation, with large increase (2.45 feet) in BRW-2. If the anomalous rise in BRW-2 groundwater elevation is excluded, the average elevation actually *decreased* by 0.11 feet, with the largest declines in elevation in the upper field wells (MW-2, MW-3S/D, and MW-4S/S), and mixed trends in the lower field wells.

Groundwater elevations were also plotted to develop a groundwater elevation map for the October 2014 sampling event (see Appendix A). As this maps shows, the general direction of groundwater flow (based on shallow well data) was toward the southwest. The lateral hydraulic gradient (calculated between MW-3S and MW-102S) was 0.036 ft/ft (3.6%) in October 2014, comparable to past data. Vertical hydraulic gradients calculated between the paired wells (see Table 1.1) were generally negligible. Typically a downward gradient is observed in MW-101S/D, but no water level data could be collected from the destroyed MW-101D. Well Pair MW-104S/D had a downward gradient of 0.03 ft/ft, while MW-3S/D showed an upward gradient of 0.03 ft/ft.

2.2 Groundwater Sample Collection

Overburden monitoring wells MW-101S, MW-102S/D, MW-103RD, MW-104S/D, MW-3S/D and MW-4S/D were purged and sampled using a low-flow methodology. The low-flow methodology involves using a peristaltic pump (Geotech Geopump II) connected to dedicated, high density polyethylene (HDPE) tubing within each well that extends to a pre-specified intake depth. The dedicated HDPE tubing was connected to disposable silicone tubing that ran through the head of the peristaltic pump; new silicone tubing was used for each well purged. Purge rates ranged between 75-300 milliliters/minute (ml/min). During the purging process, the water level was monitored using a water level probe (Solinst) with a 0.25-inch probe, and geochemical parameters were measured using a water quality meter (YSI 556 Multi-Probe Meter) with a flow cell connected to the outlet of the peristaltic pump. The following field geochemical parameters were monitored: dissolved oxygen, specific conductance, temperature, pH, turbidity, and redox potential. Wells were allowed to purge until geochemical parameters stabilized, as specified by site protocols. Upon stabilization, the silicone tubing was disconnected from the water meter. Samples were then collected directly from the outlet of the peristaltic pump. The flow cell inlet was rinsed with a mixture of methanol and de-ionized water, and the probes were cleaned with de-ionized water, between each sample.

Bedrock monitoring wells BRW-1, BRW-2, BRW-3 and MW-103RD were also purged and sampled using the low-flow methodology as described above. However, the pump used was a submersible (GeoTech SS GeoSub) with HDPE tubing. The pump was decontaminated with Alconox and de-ionized water prior to use, and after use in each well. Purge rates and pump intake depths were as dictated by the site protocols. The SS GeoSub generally afforded much lower purger rates than previous submersible pumps, so the flow-through cell was still utilized to monitor parameter stabilization, with a flow rate of approximately 200-320 ml/min in bedrock wells, and 75-100 ml/min in MW-103RD. Upon stabilization, samples were collected directly from the outlet of the disposable tubing.

In both cases, the order of sample collection was as dictated by site protocols, and all samples were collected in pre-acidified sampling containers supplied by the laboratory and immediately placed on ice in a cooler. All samples were delivered by WHEM to Test America laboratory (TA) of South Burlington, Vermont for analysis of volatile organic compounds via EPA Method 8260B. The following four target VOCs are monitored as part of this project: tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and trans-1,2-dichloroethene (trans-1,2-DCE). Results, in micrograms per liter (ug/L), are discussed below.

2.3 Purgewater Management

All purgewater generated during this event was containerized in 5-gallon pails with watertight caps and transported by WHEM to the UniFirst Plant site in Williamstown, Vermont, where the water was added into the groundwater treatment system. This was accomplished by pouring the purgewater into a sump present in the treatment shed that is connected to the activated carbon treatment train. This protocol was introduced in 2012 and will be followed on all future monitoring events, with no further disposal of purgewater on the ground as previously done.

2.4 Discussion of Results

2.4.1 Field Geochemical Data

Field geochemical parameter measurements are summarized in Tables 1.2 through 1.7 in Appendix B. The following observations were made based on comparison of the October 2014 data with historical data:

- **Dissolved Oxygen:** readings were generally lower in 2014, with particularly low readings recorded at MW-103RD and BRW-2, likely due to the much lower flow-rates achieved with the GeoSub submersible. Previous submersible pumps (Grundfos RediFlow) could not achieve flow of less than 1-2L/min, increasing turbidity and DO values. The DO value in MW-104D was also low, but this parameter seems to fluctuate significantly in this well. Generally, values were within the range of historical measurements.
- **Specific Conductance:** October readings were generally in the lower range of historical measurements. Values in recent years have generally trended downwards, likely related to the adoption of low-flow sampling.
- **pH:** October readings were within the range of historical measurements with no anomalies or clear trends noted.
- **Turbidity:** October readings were consistent with 2012-2013 data, except in well MW-104D, which increased and returned to pre-2012 turbidity.
- **Redox:** October readings were within the range of historical measurements with no anomalies or clear trends noted, with the exception of BRW-1.

Parameter measurements from new replacement well pair MW-103RS/D were compared to the old well pair MW-103S/D. As with previous rounds, WHEM noted increased turbidity and pH relative to the old well pair—all other parameters are similar. Unfortunately, MW-103RS could not be sampled this round, as it was dry.

2.4.2 Laboratory Data

Validated laboratory analytical results are summarized in Table 2.0 in Appendix B and in the Data Validation Report [9] prepared by Phoenix Chemistry Service in Appendix E.

The analytical results for the target compounds of interest during October 2014 are described on the following page, along with an assessment of visually estimated trends for each compound:

PCE

- PCE was detected above reporting limits in wells MW-3S/D, MW-4S/D, MW-101S, and MW-102S.
- PCE was not detected above reporting limits in any of the following wells: MW-102D, MW-103RD, MW-104S/D, BRW-1, BRW-2, and BRW-3.
- PCE concentrations decreased in MW-3S, MW-101S, and MW-102S. The PCE concentration in MW-3S (40 ug/L) is the lowest reported value to date. The concentration of PCE in MW-101S decreased to historic levels following a spike in October 2013. Levels in MW-101S appear to fluctuate, but with a slight downward trend over time.

- Concentrations increased slightly in MW-3D, MW-4S and MW-4D, but remained within historic ranges.
- With the exception of an increasing trend in PCE concentrations between 2005 and 2007 in well MW-102S, PCE has generally been decreasing or stable with time.

TCE

- TCE was detected above reporting limits in wells MW-3S/D, MW-101S, and MW-102S.
- TCE was not detected above reporting limits in any of the following wells: MW-4S, MW-4D, MW-102D, MW-103RD, MW-104S/D, BRW-1, BRW-2, or BRW-3.
- TCE decreased in all wells except MW-3D, where it increased marginally from October 2013.
- TCE has generally been decreasing or stable with time.

cis-1,2-DCE

- cis-1,2-DCE was detected above reporting limits in wells MW-3S and MW-102S, and a trace detection estimated below the detection limit was reported in MW-101S.
- cis-1,2-DCE was not detected above reporting limits in wells MW-3D, MW-4S/D, MW-102D, MW-103RD, MW-104S/D, BRW-1, BRW-2, or BRW-3.
- cis-1,2-DCE decreased between in all wells between October 2013 and October 2014.
- cis-1,2-DCE has generally been decreasing or stable with time.

trans-1,2-DCE

- trans-1,2-DCE was estimated below the reporting limit in MW-3S and MW-102S.
- trans-1,2-DCE was not detected above reporting limits in any of the following wells: MW-3D, MW-4S/D, MW-101S, MW-102D, MW-103RS/D, MW-104S/D, BRW-1, BRW-2, or BRW-3.
- trans-1,2-DCE has generally been decreasing or stable with time.

Compared to Vermont groundwater enforcement standard (“VGES”) [10] most of the reported PCE concentrations were above the 5.0 ug/L standard for each compound. Wells out of compliance with VGES for PCE and/or TCE during the October 2014 event include: MW-3S/D, MW-101S, and MW-102S. PCE levels in MW-4D have fallen after fluctuating around the VGES over the last several sampling rounds. Typically MW-101D would greatly exceed the VGES, but this well has been destroyed.

To compare the 2014 results to historical groundwater results, PCE concentrations were plotted against time (see graphs in Appendix C). As these graphs show, long-term concentration trends are generally decreasing or stable with time. The wells that are not shown in the graphs in Appendix C are generally non-detect for the target compounds.

Regarding the distribution of CVOC contamination, the plume continues to extend in a general northeast/southwest orientation between wells MW-3S/D and MW-102S/D. The approximate limits of the plume during October 2014 are shown in the map in Appendix A. The dimensions have not changed significantly from previous years, and continue to show that the plume of CVOC contamination does not extend to the Ayers Brook.

2.4.3 QA/QC Samples

As part of the quality assurance/quality control (QA/QC) program, WHEM collected field duplicate samples during the October 2014 event. During October, sample "MW-Z" was collected in conjunction with MW-101S. Duplicate samples were analyzed by TA using the same method (EPA Method 8260B). In all cases, precision in these field duplicate samples was acceptable (less than 30% RPD) for all target analytes greater than 2 times the quantitation limit (PCE only).

During each day of sampling for the October sampling events, one field blank was prepared and one pre-containerized trip blank was added to the cooler and submitted for analysis by EPA Method 8260B. No target compounds were reported in any field blank or trip blank sample collected at the site during 2014. Non-target compounds were estimated at trace concentrations below detection limits in FB-1 (Acetone, Methylene chloride) and one laboratory blank (VHBLK02); these detections do not call into question the validity of groundwater data collected in October 2014.

2.5 Discussion of Data Validation

The laboratory data from the October 2014 sampling event were validated by Phoenix Chemistry Services, an independent data validator. The validation was performed in accordance with Tier III guidelines as described by the USEPA Region I. Details are presented in the Data Validation Report [9] in Appendix E.

Results for target volatile organic compounds in groundwater collected from the Site during October 2014 were determined to be valid as reported for all samples. While there were qualifications for non-target compounds (acetone, methylene chloride, chloromethane and bromomethane), and some documentation and compliance issues noted for the sample group, these issues did not directly affect the validity of the groundwater data.

2.6 Well Maintenance

MW-101D, a well that typically has the highest concentration of PCE and TCE, was destroyed most likely by a snow plow or tractor prior to the October 2014 monitoring round. This well will be reinstalled prior to October 2015 sampling, in conjunction with other work at the site.

2.7 Recommendations

Based on the above information, overburden groundwater at the Site continues to show evidence of chlorinated VOCs at concentrations that exceed applicable enforcement standards. Given these conditions, WHEM recommends continuing the groundwater monitoring program as specified in the Work Plan and FLCM-Water. The next groundwater sampling event is scheduled for October 2015. Prior to the next sampling event, monitoring well MW-101D will be reinstalled (MW-101DR) with identical depth and screen length.

3.0 WATER SUPPLY SAMPLING

Water supply sampling was conducted by WHEM from the active bedrock well at the former Shields residence (now Hammond) on April 9 and October 20, 2014. The former Bressett household remains vacant, so no sampling occurred. The water supply sampling locations is the bedrock well at the former Shields residence on Town Road #23. Sampling locations are shown in the Site Plan in Appendix A.

3.1 Water Supply Sample Collection

The Shields well is accessed via the hand-activated pump on the well head. During both April and October 2014 the well was purged of approximately 50 gallons prior to sampling. The sample was collected directly from the hand pump discharge nozzle.

All samples were delivered by WHEM to TA. Water supply samples were submitted for analysis of volatile organic compounds via EPA Method 524.2. Results for PCE, TCE, cis-1,2-DCE and trans-1,2-DCE are discussed below.

3.2 Discussion of Results

Validated laboratory analytical results are summarized in Table 3.0 in Appendix B. Full copies of the laboratory reports are presented in Data Validation Reports prepared by Phoenix Chemistry Service [6,9].

The analytical results indicate the following:

- No target VOCs were detected above reporting limits in the Shields Well during both April and October 2014.

Historical results indicate that the Shields well is regularly free of detectable VOCs, and 2014 results support this finding. PCE was regularly detected at very low concentrations at the Bressett locations during 2006-08, attributed to diffusion or penetration into the buried polyethylene water pipe. The lack of PCE in the water supply during 2012 and 2013 sampling events is a result of the replacement of this buried water pipe with a new copper line in the fall of 2009. WHEM recommends discontinuing sampling at the Bressett tap so long as the home is unoccupied.

3.2.1 QA/QC Samples

As part of the QA/QC program, WHEM collected field duplicate samples during each sample event. During both April and October 2014, "Well-Z" was collected in conjunction with the Shields Well. Each sample was analyzed by TA using the same method (EPA Method 524.2). No target compounds were detected at concentrations greater than 2 times the quantitation limit in any sample, so precision could not be evaluated.

WHEM also prepared field blanks and added pre-made trip blanks to the cooler during each day of water supply sampling in April and October 2014. All samples were submitted to TA for analysis by EPA Method 524.2. No target compounds were reported in any of these blank samples.

3.3 Discussion of Data Validation

The laboratory data from the April and October 2014 sampling events were validated by Phoenix Chemistry Services, an independent data validator. The validation was performed in accordance with Tier III guidelines as described by the USEPA Region I. Details are presented in the Data Validation Reports [6,9]. The data validation report for October sampling is provided in Appendix E.

Results for target volatile organic compounds in groundwater collected from the Site during October 2014 were determined to be valid as reported for all samples. While there were qualifications for non-target compounds (acetone, methylene chloride, chloromethane and bromomethane), as well as some documentation and compliance issues noted for the sample group, none of these issues directly affected the validity of the supply well data.

3.4 Recommendations

Due to former presence of PCE in at the point of entry of the former Bressett residence in 2006-2008 and the continuing presence of chlorinated VOCs in the overburden aquifer, WHEM recommends continuing with the supply well monitoring program as specified in the *Work Plan* and *FLCM-Water* with the exception of removing the Bressett sample as long as the property is unoccupied. The next water supply sampling event is scheduled to occur in April 2015.

4.0 SURFACE WATER SAMPLING

Surface water sampling was conducted by WHEM on July 30, 2014 from two tributaries to the Ayers Brook. Sampling was conducted in accordance with WHEM's *Work Plan* and with the *Field/Lab Coordination Memorandum for Water Monitoring* ("FLCM-Water") developed by Phoenix Chemistry Services dated June 4, 2013. It should be noted that the Ayers Brook has changed course considerably over the past year and undercutting has washed out the location where SW-1 has historically been sampled. As a result, the sample location was moved upstream in the unnamed tributary/swale approximately 30 ft. No significant changes were noted at SW-2.

4.1 Surface Water Sample Collection

WHEM collected two (2) surface water samples on July 30, 2014. Regular sampling locations, labeled as SW-1 and SW-2 in the Site Map in Appendix A, are along the Howard Hill Brook,

and an unnamed tributary of the Ayers Brook. The unnamed tributary of the Ayers Brook (SW-1) has been modified by erosion, so the sampling location was moved approximately 30 ft upstream. This small brook/swale was stagnant on the day of sampling, but there was sufficient water to collect a sample. The Howard Hill Brook sample (SW-2) was collected by dipping the container into the stream at the middle of the channel. The Brook was flowing at an approximate rate of 500 gpm. Flow rate at SW-2 was measured upstream of the sample by measuring the stream flow velocity and calculating the stream channel area in the culvert that underlies Route 12.

All samples were delivered by WHEM to TA for analysis of volatile organic compounds via EPA Method 8260B on the day of sampling. Results for PCE, TCE, cis-1,2-DCE and trans-1,2-DCE are discussed below.

4.2 Discussion of Results

Surface water sampling results from July 2014 are summarized in Table 1.0 in Appendix B. These results have been validated by an independent validator (see Section 4.3). Full copies of the laboratory report are presented in the data validation report on file in Montpelier.

The laboratory results indicate that target VOCs were not reported above quantitation limits in either sample collected during the July 2014 sampling event. Based on results dating back to 2001, target VOCs have never been detected at these two sampling locations.

4.2.1 QA/QC Samples

As part of the QA/QC program, WHEM normally collects one (1) field duplicate sample with the surface water samples. Field duplicate sample WQ-X was collected in conjunction with sample WQ-1. No target compounds were detected in either duplicate sample.

WHEM also submitted one (1) trip blank (TB-1) as part of the July 2014 sampling event for analysis by EPA Method 8260B. No target compounds were detected in the trip blank.

4.3 Discussion of Data Validation

The laboratory data were validated by Phoenix Chemistry Services, an independent data validator. The validation was performed in accordance with Tier III guidelines as described by the USEPA Region I. Details are presented in the report: *Data Validation for the UniFirst Project, Bressett and UniFirst Sites, Randolph and Williamstown, VT (Sample Delivery Group Nos. BRES58 and UNIF50), October 9, 2014* prepared by Phoenix Chemistry Service. The full report is on file at the VT DEC offices in Montpelier, and the text is provided in Appendix D.

The findings of the validation effort resulted in the following qualification of sample results:

- Results for bromomethane in all samples were qualified as estimated (UJ).

While there were some minor documentation issues, these issues do not directly affect the validity of the analytical data.

4.4 Recommendations

As is typical, no target compounds were detected in either surface water sampling location. However, due to the continued presence of target contaminants in the overburden as measured downgradient of the source area, WHEM recommends continued sampling in accordance with the approved *Work Plan* and *FLCM-Water*, with the next round to be conducted in July 2016. WHEM will update the site plan by collecting GPS coordinates via a Trimble GeoXT Sub-Meter GPS unit at the new sampling location.

5.0 INDOOR AIR SAMPLING

Indoor air sampling was not conducted in 2015, as the former Bressett residence was vacant throughout the year. Should the home be reoccupied, indoor air sampling will resume in accordance with the approved *Work Plan* and the *FLCM – Air*.

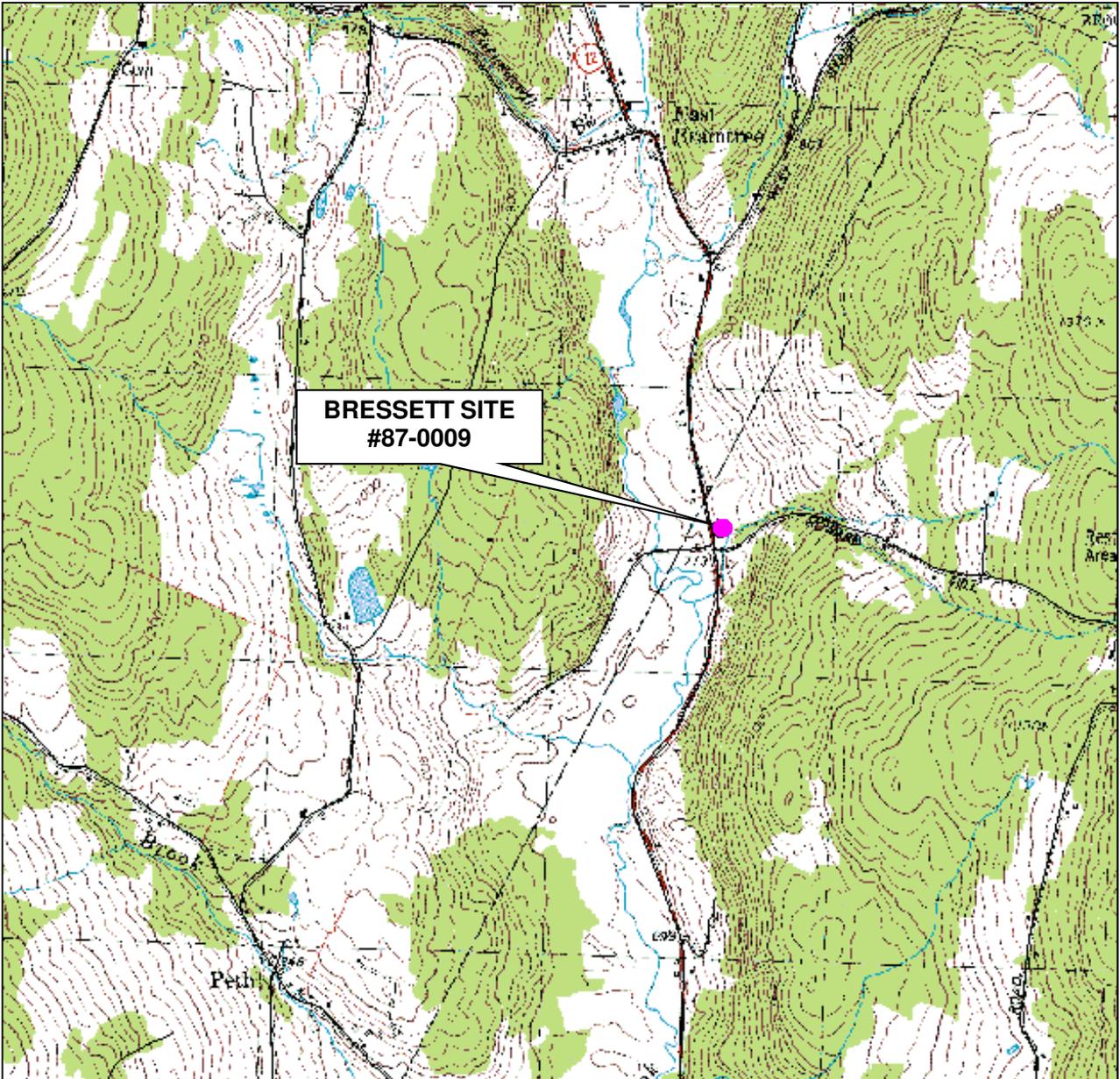


6.0 REFERENCES

1. Waite-Heindel Environmental Management, LLC, *Work Plan for Environmental Monitoring at the UniFirst Plant Site, Williamstown, Vermont, Wheatley Farm Site, Brookfield, Vermont, Bressett Site, Randolph, Vermont*, July 11, 2013.
2. Phoenix Chemistry Services, *Field/Lab Coordination Memorandum for Water Monitoring, UniFirst Plant Site, Williamstown, Vermont, Wheatley Farm Site, Brookfield, Vermont, Bressett Site, Randolph, Vermont*, June 4, 2013.
3. Phoenix Chemistry Services, *Field/Lab Coordination Memorandum for Air Monitoring, UniFirst Plant Site, Williamstown, Vermont, Wheatley Farm Site, Brookfield, Vermont, Bressett Site, Randolph, Vermont*, December 22, 2007.
4. Waite-Heindel Environmental Management, LLC, *2nd Quarter 2014 Monitoring Report, Bressett Site, Randolph, Vermont*, July 10, 2014.
5. Waite-Heindel Environmental Management, LLC, *3rd Quarter 2014 Monitoring Report, Bressett Site, Randolph, Vermont*, October 20, 2014.
6. Phoenix Chemistry Services, *Data Validation for the UniFirst Project, Bressett and UniFirst Sites, Randolph and Williamstown, VT, Organic Analysis Data, Volatile Organics in Water Samples, Sample Delivery Group Nos. BRES57 and UNIF49, May 29, 2014*
8. Phoenix Chemistry Services, *Data Validation for the UniFirst Project, Bressett and UniFirst Sites, Randolph and Williamstown, VT (Sample Delivery Group Nos. BRES58 and UNIF50), October 9, 2014*
9. Phoenix Chemistry Services, *Data Validation for the UniFirst Project, Bressett, Wheatley and UniFirst Sites, Randolph, Brookfield, and Williamstown, VT, Volatile Organics in Water Samples, Sample Delivery Group Nos. BRES59, UNIF52, and WHEA20, January 26, 2015.*
10. State of Vermont, Agency of Natural Resources, Department of Environmental Conservation, *Chapter 12, Groundwater Protection Rule and Strategy*, February, 2005.

APPENDIX A:

FIGURES

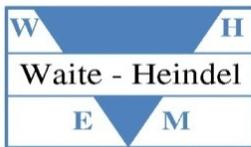


LEGEND

● State-Listed Hazardous Waste Site



Map Source: *USGS Mapping 7.5 Minute Quadrangle: Randolph (1981)*

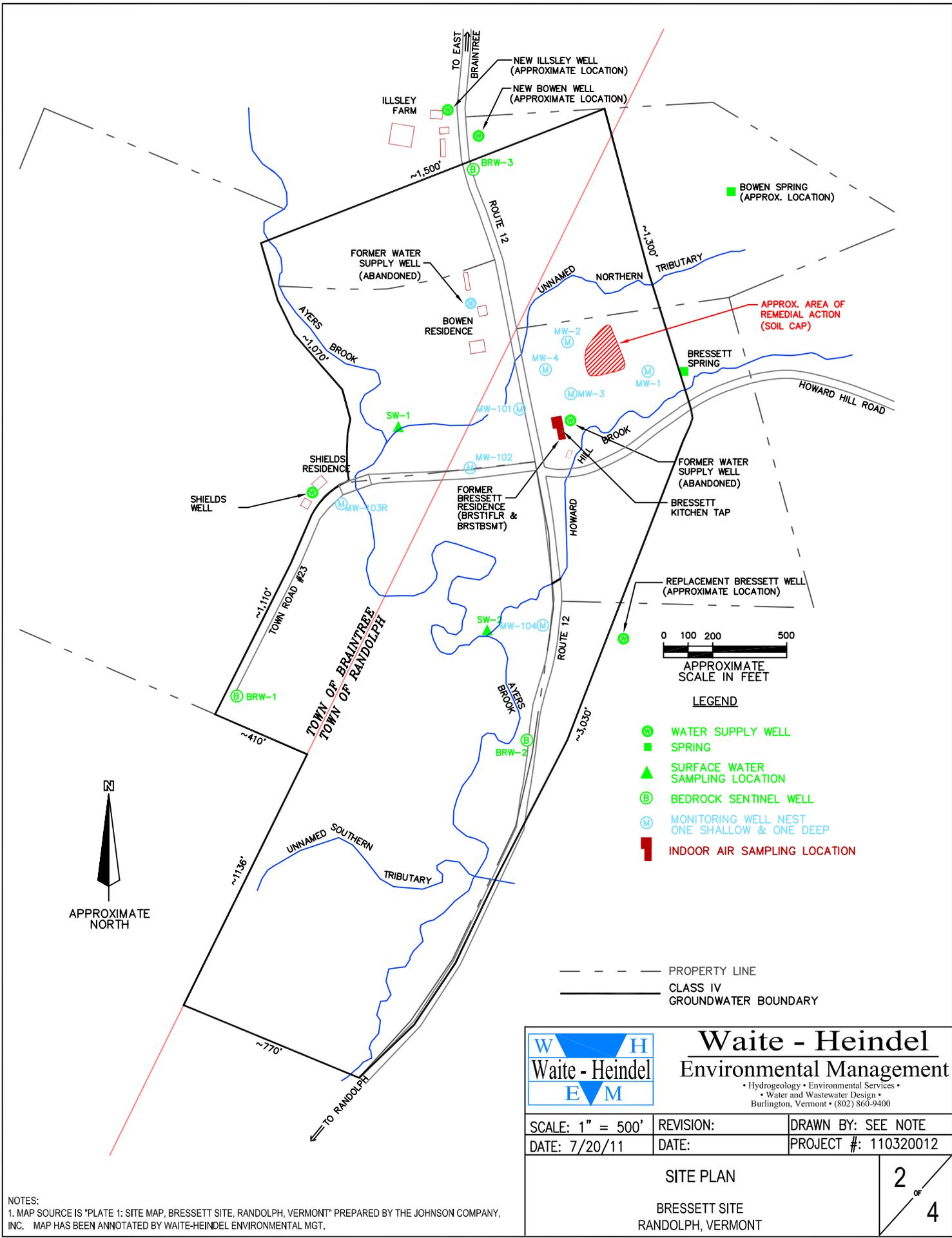


Waite-Heindel
Environmental Management

SITE LOCATION MAP

Bressett Site
Randolph, Vermont

Date: 12/15/12 | Drawing No. 1 | Scale: 1:24,000 | By: MEW

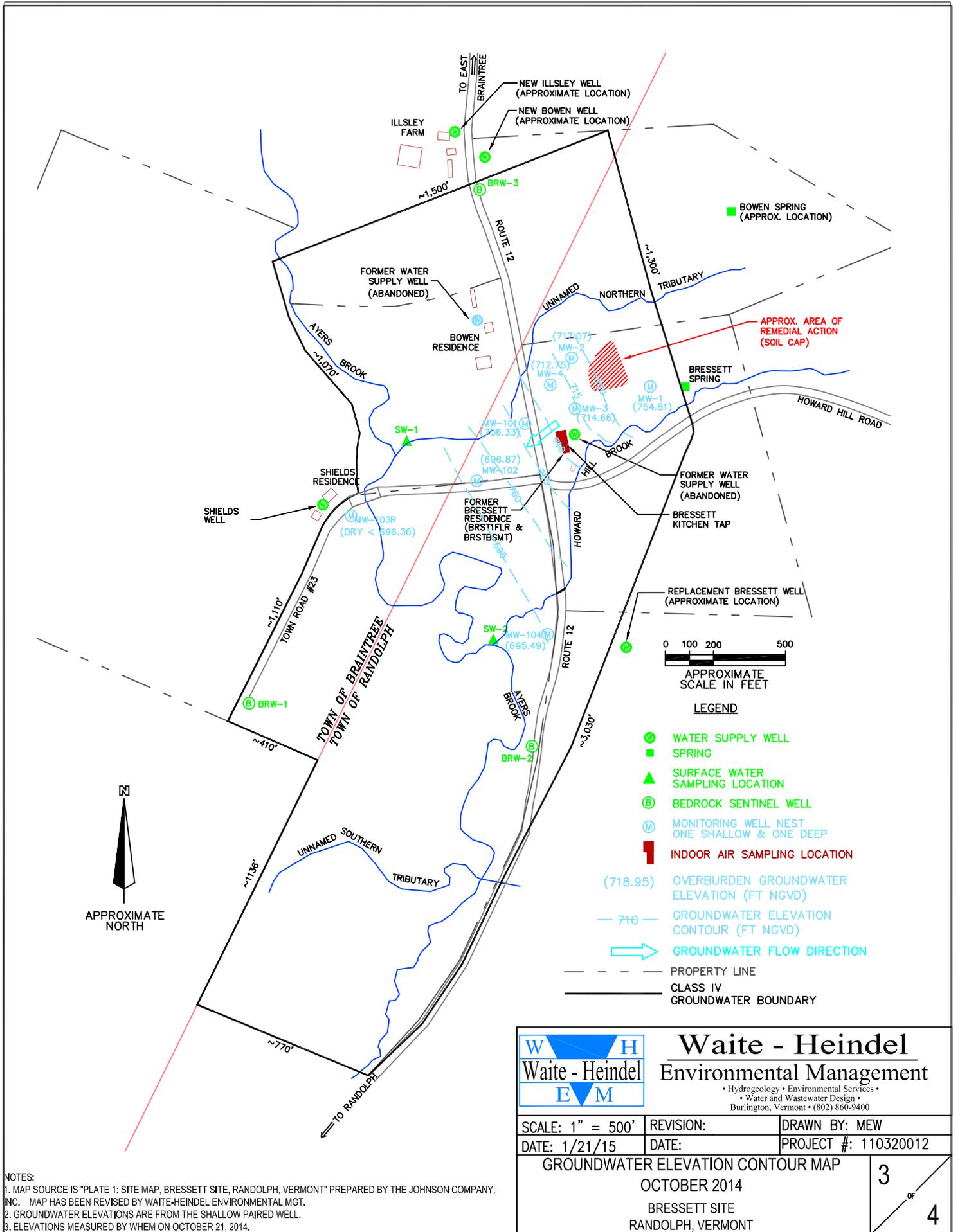


NOTES:
 1. MAP SOURCE IS "PLATE 1: SITE MAP, BRESSETT SITE, RANDOLPH, VERMONT" PREPARED BY THE JOHNSON COMPANY, INC. MAP HAS BEEN ANNOTATED BY WAITE-HEINDEL ENVIRONMENTAL MGT.

	<h2 style="margin: 0;">Waite - Heindel</h2> <h3 style="margin: 0;">Environmental Management</h3>	
	• Hydrogeology • Environmental Services • • Water and Wastewater Design • Burlington, Vermont • (802) 860-9400	

SCALE: 1" = 500'	REVISION:	DRAWN BY: SEE NOTE
DATE: 7/20/11	DATE:	PROJECT #: 110320012

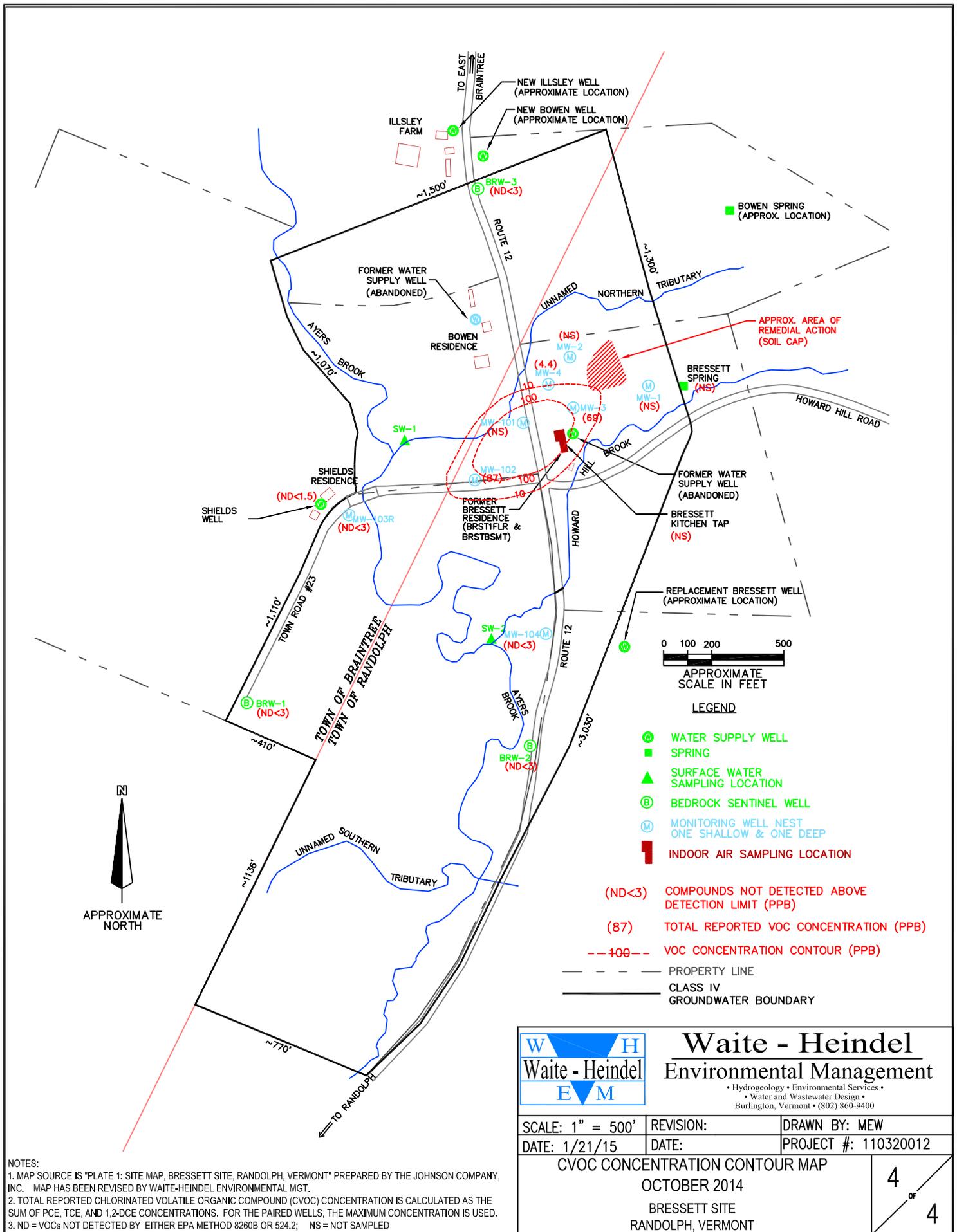
SITE PLAN BRESSETT SITE RANDOLPH, VERMONT	2 <small>OF</small> 4
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		<h2 style="margin: 0;">Waite - Heindel</h2> <h3 style="margin: 0;">Environmental Management</h3> <p style="font-size: small; margin: 0;">• Hydrogeology • Environmental Services • • Water and Wastewater Design • Burlington, Vermont • (802) 860-9400</p>	
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SCALE: 1" = 500'	REVISION:	DRAWN BY: MEW
DATE: 1/21/15	DATE:	PROJECT #: 110320012

GROUNDWATER ELEVATION CONTOUR MAP		3 of 4
OCTOBER 2014		
BRESSETT SITE RANDOLPH, VERMONT		



NOTES:
 1. MAP SOURCE IS "PLATE 1: SITE MAP, BRESSETT SITE, RANDOLPH, VERMONT" PREPARED BY THE JOHNSON COMPANY, INC. MAP HAS BEEN REVISED BY WAITE-HEINDEL ENVIRONMENTAL MGT.
 2. TOTAL REPORTED CHLORINATED VOLATILE ORGANIC COMPOUND (CVOC) CONCENTRATION IS CALCULATED AS THE SUM OF PCE, TCE, AND 1,2-DCE CONCENTRATIONS. FOR THE PAIRED WELLS, THE MAXIMUM CONCENTRATION IS USED.
 3. ND = VOCs NOT DETECTED BY EITHER EPA METHOD 8260B OR 524.2; NS = NOT SAMPLED



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DATE: 1/21/15	DATE:	PROJECT #: 110320012

CVOC CONCENTRATION CONTOUR MAP
 OCTOBER 2014
 BRESSETT SITE
 RANDOLPH, VERMONT



APPENDIX B:

TABLES



TABLE 1.1
Groundwater Elevation Measurements: 2009-2014
Bressett Site, Randolph, Vermont

Location	Type	Units	Screen Center Elevation	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14	Oct-13 Vertical Hydraulic Gradient (ft/ft)	Oct-14 Vertical Hydraulic Gradient (ft/ft)
MW-101D	Monitoring Well	FT	690.52	706.59	706.22	706.82	706.78	707.84	706.68	705.35	705.51		-0.08	NA
MW-101S	Monitoring Well	FT	701.03	707.50	707.33	707.75	707.83	708.79	707.62	706.28	706.36	706.63		
MW-102D	Monitoring Well	FT	674.76	697.17	697.05	697.49	697.63	698.55	697.52	696.83	696.75	696.95	-0.01	0.01
MW-102S	Monitoring Well	FT	689.46	697.30	696.99	697.51	697.72	698.60	697.51	696.92	696.87	696.87		
MW-103D	Monitoring Well	FT	685.48	699.55	698.74	700.24	well destroyed							
MW-103S	Monitoring Well	FT	697.39	698.94	< 695.05	698.77	well destroyed							
MW-103RD	Monitoring Well	FT	687.50	695.93	695.44				697.12	694.99	695.01	694.90	NA	
MW-103RS	Monitoring Well	FT	697.76	695.83	< 695.53				697.94	696.36	DRY	DRY		
MW-104D	Monitoring Well	FT	676.26	695.93	695.44	695.62	695.73	696.62	696.43	695.76	694.89	695.45	-0.03	-0.003
MW-104S	Monitoring Well	FT	690.98	695.83	695.53	695.86	695.85	696.60	696.46	695.93	695.33	695.49		
MW-1	Monitoring Well	FT	755.60	755.13	755.33	756.33	756.80	757.62	755.98	755.14	754.39	754.81	NA	NA
MW-2D	Monitoring Well	FT	683.40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2S	Monitoring Well	FT	714.50	720.63	718.05	720.43	720.70	721.01	718.85	715.75	717.76	717.07	0.04	0.03
MW-3D	Monitoring Well	FT	664.55	717.42	716.53	717.91	717.69	720.13	717.20	715.05	716.78	716.38		
MW-3S	Monitoring Well	FT	714.09	717.72	715.35	717.61	715.36	718.06	716.08	713.47	714.99	714.66	-0.02	0.01
MW-4D	Monitoring Well	FT	689.82	714.96	713.76	715.07	714.09	716.05	714.27	712.02	713.28	712.99		
MW-4S	Monitoring Well	FT	711.44	715.92	714.06	715.91	714.02	716.07	714.61	712.02	713.61	712.75	NA	NA
BRW-1	Monitoring Well	FT	659.30	704.97	703.73	706.13	704.13	708.56	704.83	701.78	702.26	702.11		
BRW-2	Monitoring Well	FT	639.40	695.66	694.83	696.18	695.20	697.67	698.45	696.18	693.89	696.34	NA	NA
BRW-3	Monitoring Well	FT	678.00	723.83	721.81	724.80	722.17	725.95	723.44	716.18	717.18	716.87	NA	NA

Notes:

- All elevations in feet above NGVD; "NGVD" - National Geodetic Vertical Datum (1988).
- "Dry" = well dry during monitoring event; "NA" = data not available.
- Negative sign ("-") indicates downward vertical gradient. Positive numbers indicate upward vertical gradients.
- Screen center elevations are from Tighe & Bond reports: "2002 Monitoring Report Summary, Bressett Site" (March 12, 2003) and "2003 Monitoring Report Summary, Bressett Site" (March 12, 2004).

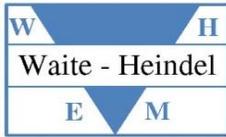


TABLE 1.2
Dissolved Oxygen Field Measurements:
2009 - 2014 Bressett Site,
Randolph, Vermont

Location	Type	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
MW-101D	Monitoring Well	mg/L	0.00	0.59	1.23	4.80	5.30	6.58	2.11	3.33	
MW-101S	Monitoring Well	mg/L	0.00	0.00	0.00	3.29	4.14	4.60	0.00	0.85	1.26
MW-102D	Monitoring Well	mg/L	0.00	0.00	0.00	3.92	3.62	5.26	0.00	0.65	0.73
MW-102S	Monitoring Well	mg/L	1.61	4.05	4.93	7.69	8.35	10.00	6.40	6.43	6.78
MW-103D	Monitoring Well	mg/L	0.00	0.00	0.00						
MW-103S	Monitoring Well	mg/L	NA	DRY	NA						
MW-103RD	Monitoring Well	mg/L						4.55	0.00	0.10	0.51
MW-103RS	Monitoring Well	mg/L						8.78	DRY	DRY	DRY
MW-104D	Monitoring Well	mg/L	0.00	0.00	0.00	5.27	3.75	5.39	0.00	1.30	0.65
MW-104S	Monitoring Well	mg/L	0.19	1.89	3.04	4.39	10.29	6.53	4.58	5.46	4.79
MW-1	Monitoring Well	mg/L	NA								
MW-2D	Monitoring Well	mg/L	NA								
MW-2S	Monitoring Well	mg/L	NA								
MW-3D	Monitoring Well	mg/L	1.06	0.13	2.41	7.16	8.86	8.28	1.64	5.61	3.05
MW-3S	Monitoring Well	mg/L	4.15	8.60	10.03	8.87	15.21	14.55	11.54	9.09	8.99
MW-4D	Monitoring Well	mg/L	4.10	6.56	7.22	7.68	12.52	11.76	6.39	3.98	5.59
MW-4S	Monitoring Well	mg/L	6.14	7.89	11.18	9.30	17.23	14.35	9.59	9.07	8.31
BRW-1	Monitoring Well	mg/L	2.35	1.31	3.01	4.49	7.10	8.64	2.11	2.80	4.55
BRW-2	Monitoring Well	mg/L	0.99	0.00	0.69	2.96	4.31	5.99	0.91	0.20	0.49
BRW-3	Monitoring Well	mg/L	6.45	6.42	7.84	6.05	9.03	11.33	4.54	6.56	6.48

Notes:

- All dissolved oxygen measurements in milligrams/liter (mg/L).
- "Dry" = well dry during monitoring event; "NA" = data not available; blank = well not present
- In October 2013, monitoring wells MW-3S, MW-3D, MW-4D, MW-101S/D, MW-102S/D, MW-103RD, and MW-104S/D were purged at 100 ml/min or slower, with readings collected every 2-3 minutes rather than 5 minutes as outlined in the work plan; therefore, parameters may not have stabilized accordingly in these wells.

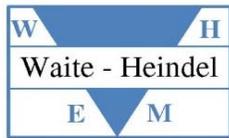


TABLE 1.3
Specific Conductance Field
Measurements: 2009 - 2014
Bressett Site, Randolph, Vermont

Location	Type	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
MW-101D	Monitoring Well	us/cm	920	960	NA	860	996	960	698	693	693
MW-101S	Monitoring Well	us/cm	990	378	NA	368	396	396	296	352	366
MW-102D	Monitoring Well	us/cm	892	374	NA	363	448	417	274	286	300
MW-102S	Monitoring Well	us/cm	488	NA	NA	413	497	462	309	329	347
MW-103D	Monitoring Well	us/cm	541	301	NA						
MW-103S	Monitoring Well	us/cm	NA	DRY	NA						
MW-103RD	Monitoring Well	us/cm						293	201	204	177
MW-103RS	Monitoring Well	us/cm						219	DRY	DRY	DRY
MW-104D	Monitoring Well	us/cm	914	284	NA	197	363	430	306	254	301
MW-104S	Monitoring Well	us/cm	336	NA	NA	366	458	311	322	307	342
MW-1	Monitoring Well	us/cm	NA								
MW-2D	Monitoring Well	us/cm	NA								
MW-2S	Monitoring Well	us/cm	NA								
MW-3D	Monitoring Well	us/cm	352	NA	NA	378	473	440	264	267	281
MW-3S	Monitoring Well	us/cm	391	NA	NA	499	543	623	442	447	424
MW-4D	Monitoring Well	us/cm	292	541	NA	310	383	360	222	235	236
MW-4S	Monitoring Well	us/cm	113	371	NA	123	90	118	122	62	76
BRW-1	Monitoring Well	us/cm	478	248	NA	214	269	257	166	167	172
BRW-2	Monitoring Well	us/cm	611	362	NA	310	383	343	448	350	338
BRW-3	Monitoring Well	us/cm	405	NA	NA	353	428	431	328	277	293

Notes:

- All conductivity measurements in microsiemens per centimeter (us/cm).
- "Dry" = well dry during monitoring event; "NA" = data not available.; blank = well not present-
- In October 2013, monitoring wells MW-3S, MW-3D, MW-4D, MW-101S/D, MW-102S/D, MW-103RD, and MW-104S/D were purged at 100 ml/min or slower, with readings collected every 2-3 minutes rather than 5 minutes as outlined in the work plan; therefore, parameters may not have stabilized accordingly in these wells.



TABLE 1.4
Temperature Field Measurements: 2009- 2014
Bressett Site, Randolph, Vermont

Location	Type	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
MW-101D	Monitoring Well	deg C	10.7	9.5	10.8	11.9	11.9	12.1	12.9	11.07	
MW-101S	Monitoring Well	deg C	9.6	11.3	9.2	13.5	9.9	13.7	12.2	13.70	12.80
MW-102D	Monitoring Well	deg C	12.1	9.0	10.6	10.5	10.7	11.7	9.6	9.32	8.96
MW-102S	Monitoring Well	deg C	11.1	10.0	11.0	11.1	11.9	12.2	10.3	10.86	10.13
MW-103D	Monitoring Well	deg C	8.2	9.6	7.9	NA	NA	NA	NA	NA	NA
MW-103S	Monitoring Well	deg C	NA	DRY	NA						
MW-103RD	Monitoring Well	deg C						13.2	11.0	11.47	9.64
MW-103RS	Monitoring Well	deg C						15.2	DRY	DRY	DRY
MW-104D	Monitoring Well	deg C	18.2	10.4	9.4	10.9	7.9	11.2	11.6	9.86	10.09
MW-104S	Monitoring Well	deg C	7.4	11.5	7.9	11.6	6.1	12.2	11.6	11.62	11.71
MW-1	Monitoring Well	deg C	NA								
MW-2D	Monitoring Well	deg C	NA								
MW-2S	Monitoring Well	deg C	NA								
MW-3D	Monitoring Well	deg C	9.0	8.0	9.7	8.2	11.8	8.7	9.8	8.90	8.27
MW-3S	Monitoring Well	deg C	9.4	8.4	9.4	8.5	10.7	8.9	9.6	9.76	8.82
MW-4D	Monitoring Well	deg C	9.0	9.0	10.8	8.1	11.4	9.0	8.9	10.07	8.47
MW-4S	Monitoring Well	deg C	9.2	8.4	10.5	9.0	11.9	9.6	8.8	10.63	8.74
BRW-1	Monitoring Well	deg C	9.2	9.3	9.3	9.1	8.8	9.4	10.7	9.62	8.64
BRW-2	Monitoring Well	deg C	9.8	10.0	9.7	11.7	9.1	10.9	12.1	10.33	10.52
BRW-3	Monitoring Well	deg C	9.6	10.1	10.0	10.5	9.8	10.4	11.6	9.95	9.82

Notes:

- All temperature measurements in degrees Celsius (deg C).
- "Dry" = well dry during monitoring event; "NA" = data not available; blank = well not present
- In October 2013, monitoring wells MW-3S, MW-3D, MW-4D, MW-101S/D, MW-102S/D, MW-103RD, and MW-104S/D were purged at 100 ml/min or slower, with readings collected every 2-3 minutes rather than 5 minutes as outlined in the work plan; therefore, parameters may not have stabilized accordingly in these wells.



TABLE 1.5
pH Field Measurements: 2009 - 2014
Bressett Site, Randolph, Vermont

Location	Type	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
MW-101D	Monitoring Well	unitless	6.97	7.04	6.91	6.09	7.51	7.49	7.12	6.83	
MW-101S	Monitoring Well	unitless	6.61	6.49	6.19	5.68	7.00	7.08	6.49	6.23	6.34
MW-102D	Monitoring Well	unitless	7.94	7.99	7.94	6.79	7.80	8.16	8.19	7.81	7.56
MW-102S	Monitoring Well	unitless	7.64	7.62	7.57	6.42	7.84	8.14	7.72	7.43	7.48
MW-103D	Monitoring Well	unitless	7.41	7.62	7.29						
MW-103S	Monitoring Well	unitless	NA	DRY	NA						
MW-103RD	Monitoring Well	unitless						8.16	8.20	7.81	7.75
MW-103RS	Monitoring Well	unitless						7.12	DRY	DRY	DRY
MW-104D	Monitoring Well	unitless	7.86	6.98	7.45	6.09	7.78	7.63	7.45	7.05	6.94
MW-104S	Monitoring Well	unitless	7.06	7.17	7.00	5.79	7.58	7.41	7.23	7.23	7.02
MW-1	Monitoring Well	unitless	NA								
MW-2D	Monitoring Well	unitless	NA								
MW-2S	Monitoring Well	unitless	NA								
MW-3D	Monitoring Well	unitless	7.49	7.63	7.41	6.45	8.04	8.05	7.70	7.52	7.31
MW-3S	Monitoring Well	unitless	7.29	7.40	7.18	6.25	7.79	7.82	7.26	7.04	7.02
MW-4D	Monitoring Well	unitless	7.16	7.63	7.26	6.39	7.67	8.01	7.67	7.22	7.13
MW-4S	Monitoring Well	unitless	7.32	7.37	7.20	6.25	7.90	7.49	7.19	6.33	6.35
BRW-1	Monitoring Well	unitless	7.63	7.61	7.70	6.95	7.99	7.48	7.90	7.39	7.04
BRW-2	Monitoring Well	unitless	7.34	7.28	7.48	7.05	7.61	7.33	7.67	7.27	7.42
BRW-3	Monitoring Well	unitless	7.39	7.14	7.37	6.46	6.80	6.63	7.49	7.18	6.56

Notes:

- "Dry" = well dry during monitoring event; "NA" = data not available; blank = well not present
- In October 2013, monitoring wells MW-3S, MW-3D, MW-4D, MW-101S/D, MW-102S/D, MW-103RD, and MW-104S/D were purged at 100 ml/min or slower, with readings collected every 2-3 minutes rather than 5 minutes as outlined in the work plan; therefore, parameters may not have stabilized accordingly in these wells.



TABLE 1.6
Turbidity Field Measurements: 2009 - 2014
Bressett Site, Randolph, Vermont

Location	Type	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
MW-101D	Monitoring Well	NTU	> 1000	> 1000	> 1000	NA	> 1000	> 1000	497	471.9	
MW-101S	Monitoring Well	NTU	122	330	> 1000	NA	> 1000	> 1000	205	67.25	69.03
MW-102D	Monitoring Well	NTU	53.4	164	151	NA	569	171	606	68.71	78.74
MW-102S	Monitoring Well	NTU	21.4	20.9	139	NA	0.2	178	4.4	5.2	1.3
MW-103D	Monitoring Well	NTU	40.0	63.3	144						
MW-103S	Monitoring Well	NTU	NA	DRY	NA						
MW-103RD	Monitoring Well	NTU						> 1000	> 1000	> 1000	> 1000
MW-103RS	Monitoring Well	NTU						112	DRY	DRY	DRY
MW-104D	Monitoring Well	NTU	15.7	> 1000	598	NA	585	210	54.2	58.9	382.0
MW-104S	Monitoring Well	NTU	8.0	7.0	49.5	NA	0.0	103	6.9	4.2	5.3
MW-1	Monitoring Well	NTU	NA								
MW-2D	Monitoring Well	NTU	NA								
MW-2S	Monitoring Well	NTU	NA								
MW-3D	Monitoring Well	NTU	> 1000	> 1000	> 1000	NA	> 1000	> 1000	16.4	51.16	13.67
MW-3S	Monitoring Well	NTU	281	567	806	NA	445	584	0.0	2.08	7.28
MW-4D	Monitoring Well	NTU	684	> 1000	> 1000	NA	> 1000	461	0.0	1.0	4.52
MW-4S	Monitoring Well	NTU	373	268	495	NA	546	459	0.0	1.69	2.49
BRW-1	Monitoring Well	NTU	8.6	0.0	13.0	NA	0.0	0.0	0.5	0.8	2.3
BRW-2	Monitoring Well	NTU	41.1	67.9	98.6	NA	27.2	71.7	100	118	50
BRW-3	Monitoring Well	NTU	19.6	9.8	16.7	NA	0.0	0.0	10.4	5.8	14.3

Notes:

- All turbidity measurements in nephelometric turbidity units (NTU).
- "Dry" = well dry during monitoring event; "NA" = data not available; blank = well not present
- In October 2013, monitoring wells MW-3S, MW-3D, MW-4D, MW-101S/D, MW-102S/D, MW-103RD, and MW-104S/D were purged at 100 ml/min or slower, with readings collected every 2-3 minutes rather than 5 minutes as outlined in the work plan; therefore, parameters may not have stabilized accordingly in these wells.

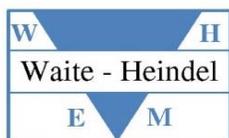


TABLE 1.7
Redox Potential Field Measurements: 2009 - 2014
Bressett Site, Randolph, Vermont

Location	Type	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
MW-101D	Monitoring Well	mV	116	185	115	119	73	35	110	88	
MW-101S	Monitoring Well	mV	120	164	146	132	92	52	127	95.4	111.1
MW-102D	Monitoring Well	mV	-190	-172	-203	-214	-215	-237	-170	-146.4	-130.8
MW-102S	Monitoring Well	mV	66	97	10	29	-27	-58	-6	13.7	27.0
MW-103D	Monitoring Well	mV	-157	-138	-141						
MW-103S	Monitoring Well	mV	NA	DRY	NA						
MW-103RD	Monitoring Well	mV						-239	-169	-165	-170
MW-103RS	Monitoring Well	mV						38	DRY	DRY	DRY
MW-104D	Monitoring Well	mV	-119	-26	-121	-15	-178	-129	-142	-120	-85
MW-104S	Monitoring Well	mV	74	106	53	156	26	-35	89	2.5	117.5
MW-1	Monitoring Well	mV	NA								
MW-2D	Monitoring Well	mV	NA								
MW-2S	Monitoring Well	mV	NA								
MW-3D	Monitoring Well	mV	153	217	176	110	87	48	181	89.1	133.5
MW-3S	Monitoring Well	mV	148	211	152	99	97	57	195	98.4	147.5
MW-4D	Monitoring Well	mV	146	200	152	89	94	44	183	85.5	130.8
MW-4S	Monitoring Well	mV	142	212	143	142	85	49	199	124.6	142.2
BRW-1	Monitoring Well	mV	-13	38	-44	-53	-45	-58	-62	-6.4	106.3
BRW-2	Monitoring Well	mV	-136	-157	-184	-235	-231	-234	-150	-154	-121
BRW-3	Monitoring Well	mV	132	246	163	69	57	40	113	158	197

Notes:

-All redox potential measurements in millivolts (mV).

- "Dry" = well dry during monitoring event; "NA" = data not available; blank = well not present

- In October 2013, monitoring wells MW-3S, MW-3D, MW-4D, MW-101S/D, MW-102S/D, MW-103RD, and MW-104S/D were purged at 100 ml/min or slower, with readings collected every 2-3 minutes rather than 5 minutes as outlined in the work plan; therefore, parameters may not have stabilized accordingly in these wells.



**TABLE 2.0
MONITORING WELL RESULTS:
2009-2014
Bressett Site, Randolph, Vermont**

Location	Parameter Method 8260B	Groundwater Enforcement Standard	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
MW-3S	PCE	5.0	ug/L	54	79	61	95	52	100	110	84	40
	TCE	5.0	ug/L	9.4	16	11	22	12	27	33	25	16
	cis-1,2-DCE	70.0	ug/L	2.7	5.4	3.4	8.9	3.5	13.0	23	11	13
	trans-1,2-DCE	100.0	ug/L	1.9 U	0.68 J	2.1 U	0.61 J	0.35 J	0.76 J	0.5 J	1.2	0.46 J
MW-3D	PCE	5.0	ug/L	97	220	150	220	210	170	23	9.5	12
	TCE	5.0	ug/L	9.8	22	22	25	24	19	1.9	1.0	1.1
	cis-1,2-DCE	70.0	ug/L	9.2	24	26	32	33	24	1.0 U	1.0 U	1.0 U
	trans-1,2-DCE	100.0	ug/L	3.8 U	1.4	1.1	1.6 J	2.1 J	0.98 J	1.0 U	1.0 U	1.0 U
MW-4S	PCE	5.0	ug/L	0.79 J	2.1	0.66 J	1.0	0.82 J	1.5	1.5	0.74 J	1.4
	TCE	5.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
	cis-1,2-DCE	70.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
	trans-1,2-DCE	100.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
MW-4D	PCE	5.0	ug/L	15	11	9.0	6.9	4.6	5.1	3.0	1.0	2.4
	TCE	5.0	ug/L	0.92 J	1.0 U	0.42 J	0.29 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	cis-1,2-DCE	70.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
	trans-1,2-DCE	100.0	ug/L	1.0 U	1.0 U	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
MW-101S	PCE	5.0	ug/L	6.2	6.9	5.0	3.0	5.7	6.8	4.0	9.0	5.2
	TCE	5.0	ug/L	1.0	1.4	1.2	0.78 J	1.2	1.3	0.8 J	1.9	1.2
	cis-1,2-DCE	70.0	ug/L	0.47 J	0.75 J	0.82 J	1.0 U	0.53 J	0.57 J	0.5 J	1.5	0.28 J
	trans-1,2-DCE	100.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 J	1.0 J	1.0 J	1.0 U	1.0 U
MW-101D	PCE	5.0	ug/L	140	150	140	140	140	140	140	140	Well Destroyed
	TCE	5.0	ug/L	30	31	28	31	29	32	33	31	
	cis-1,2-DCE	70.0	ug/L	47	47	39	43	41	43	40	38	
	trans-1,2-DCE	100.0	ug/L	1.3 J	3.4 J	3.1	0.93 J	1.3 J	0.97 J	1.0 U	0.99 J	
MW-102S	PCE	5.0	ug/L	89	70	66	68	61	76	76	75	61
	TCE	5.0	ug/L	13	11	9.8	12	9.1	15	12	14	13
	cis-1,2-DCE	70.0	ug/L	14	13	11	15	10	20	13	16	13
	trans-1,2-DCE	100.0	ug/L	0.73 J	0.73 J	2.6 U	0.57 J	0.45 J	0.67 J	0.48 J	0.58 J	0.47 J
MW-102D	PCE	5.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
	TCE	5.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
	cis-1,2-DCE	70.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
	trans-1,2-DCE	100.0	ug/L	1.0 U	1.0 U	1.0 U	1.0 U					
MW-103S	PCE	5.0	ug/L	1.0 U	DRY	1.0 U						
	TCE	5.0	ug/L	1.0 U	DRY	1.0 U			WELL DESTROYED			
	cis-1,2-DCE	70.0	ug/L	1.0 U	DRY	1.0 U						
	trans-1,2-DCE	100.0	ug/L	1.0 U	DRY	1.0 U						
MW-103D	PCE	5.0	ug/L	1.0 U	1.0 U	1.0 U						
	TCE	5.0	ug/L	1.0 U	1.0 U	1.0 U			WELL DESTROYED			
	cis-1,2-DCE	70.0	ug/L	1.0 U	1.0 U	1.0 U						
	trans-1,2-DCE	100.0	ug/L	1.0 U	1.0 U	1.0 U						
MW-103RS	PCE	5.0	ug/L						1.0 U	DRY	DRY	DRY
	TCE	5.0	ug/L						1.0 U	DRY	DRY	DRY
	cis-1,2-DCE	70.0	ug/L						1.0 U	DRY	DRY	DRY
	trans-1,2-DCE	100.0	ug/L						1.0 U	DRY	DRY	DRY
MW-103RD	PCE	5.0	ug/L						1.0 U	1.0 U	1.0 U	1.0 U
	TCE	5.0	ug/L						1.0 U	1.0 U	1.0 U	1.0 U
	cis-1,2-DCE	70.0	ug/L						1.0 U	1.0 U	1.0 U	1.0 U
	trans-1,2-DCE	100.0	ug/L						1.0 U	1.0 U	1.0 U	1.0 U



**TABLE 2.0
MONITORING WELL RESULTS:
2009-2014
Bressett Site, Randolph, Vermont**

Location	Parameter	Groundwater Enforcement Standard	Units	Apr-09	Oct-09	Apr-10	Oct-10	Apr-11	Oct-11	Oct-12	Oct-13	Oct-14
	Method 8260B											
MW-104S	PCE	5.0	ug/L	1.0 U								
	TCE	5.0	ug/L	1.0 U								
	cis-1,2-DCE	70.0	ug/L	1.0 U								
	trans-1,2-DCE	100.0	ug/L	1.0 U								
MW-104D	PCE	5.0	ug/L	1.0 U								
	TCE	5.0	ug/L	1.0 U								
	cis-1,2-DCE	70.0	ug/L	1.0 U								
	trans-1,2-DCE	100.0	ug/L	1.0 U								
BRW-1	PCE	5.0	ug/L	1.0 U								
	TCE	5.0	ug/L	1.0 U								
	cis-1,2-DCE	70.0	ug/L	1.0 U								
	trans-1,2-DCE	100.0	ug/L	1.0 U								
BRW-2	PCE	5.0	ug/L	1.0 U								
	TCE	5.0	ug/L	1.0 U								
	cis-1,2-DCE	70.0	ug/L	1.0 U								
	trans-1,2-DCE	100.0	ug/L	1.0 U								
BRW-3	PCE	5.0	ug/L	1.0 U								
	TCE	5.0	ug/L	1.0 U								
	cis-1,2-DCE	70.0	ug/L	1.0 U								
	trans-1,2-DCE	100.0	ug/L	1.0 U								

Notes:
 - "PCE" = tetrachlorethene; "TCE" = trichlorethene; "DCE" = dichloroethene.
 - "U" = not detected above listed quantitation limit; "J" = reported concentration is an estimated value; "UJ" = reported quantitation limit is an estimated value; "R" = the data are unusable (analyte may or may not be present).
 - "Dry" = well dry during monitoring event; "NA" = not applicable; "NS" = not sampled.
 - Data entered from the data validation report for each sampling event.
 - Shaded cells indicate that the reported concentration is in excess of the Enforcement Standard.
 - Groundwater Enforcement Standards referenced from Table 1, Chapter 12 - Groundwater Protection Rule and Strategy, December 2000.



**TABLE 3.0
SUPPLY WELL RESULTS: 2010-2014
Bressett Site, Randolph, Vermont**

Owner	Location	Parameter <small>Method 524.2</small>	Groundwater Enforcement Standard	Units	Apr-10	Oct-10	Apr-11	Oct-11	Apr-12	Oct-12	Apr-13	Oct-13	Apr-14	Oct-14
Voner	Bressett Kitchen Tap	PCE	0.7	ug/L	0.5 U									
		TCE	5.0	ug/L	0.5 U									
		cis-1,2-DCE	70.0	ug/L	0.5 U									
		trans-1,2-DCE	100.0	ug/L	0.5 U									
Voner	Bressett Holding Tank / Bressett Pre-Filter	PCE	0.7	ug/L	0.5 U	0.5 U	0.5 U							
		TCE	5.0	ug/L	0.5 U	0.5 U	0.5 U							
		cis-1,2-DCE	70.0	ug/L	0.5 U	0.5 U	0.5 U							
		trans-1,2-DCE	100.0	ug/L	0.5 U	0.5 U	0.5 U							
Hammond	Shields Well	PCE	0.7	ug/L	0.5 U									
		TCE	5.0	ug/L	0.5 U									
		cis-1,2-DCE	70.0	ug/L	0.5 U									
		trans-1,2-DCE	100.0	ug/L	0.5 U									
Bowen	Bowen Well	PCE	0.7	ug/L										
		TCE	5.0	ug/L										
		cis-1,2-DCE	70.0	ug/L										
		trans-1,2-DCE	100.0	ug/L										

Notes:

- "PCE" = tetrachlorethene; "TCE" = trichlorethene; "DCE" = dichloroethene.
- "U" = not detected above listed quantitation limit; "J" = reported concentration is an estimated value; "UJ" = reported quantitation limit is an estimated value; "R" = data are unusable
- "Dry" = well dry during monitoring event; "NA" = not applicable; "NS" = no sample collected.
- All data have been qualified based on the data validation report for each sampling event.
- Shaded cells indicate that the reported concentration is in excess of the Enforcement Standard.
- Enforcement Standard for PCE is the Vermont Action Level, taken from the Vermont Department of Health Drinking Water Guidance, December 2002.
- Enforcement Standard for TCE, cis-1,2-DCE, and trans-1,2-DCE is the Federal Maximum Contaminant Level (MCL), December 2002.



**TABLE 4.0
SURFACE WATER QUALITY RESULTS: 2003- 2014
Bressett Site, Randolph, Vermont**

Location	Parameter Method 8260B	Water Quality Standard	Units	Jul-03	Jul-04	Jul-05	Jul-06	Jul-07	Jul-08	Jul-09	Jul-10	Jul-11	Aug-12	Jul-14
SW-1	PCE	0.8	ug/L	DRY	1.0 U	DRY	1.0 U							
	TCE	2.7	ug/L	DRY	1.0 U	DRY	1.0 U							
	cis-1,2-DCE	NA	ug/L	DRY	1.0 U	DRY	1.0 U							
	trans-1,2-DCE	NA	ug/L	DRY	1.0 U	DRY	1.0 U							
SW-2	PCE	0.8	ug/L	1.0 U										
	TCE	2.7	ug/L	1.0 U										
	cis-1,2-DCE	NA	ug/L	1.0 U										
	trans-1,2-DCE	NA	ug/L	1.0 U										

Notes:

- "PCE" = tetrachlorethene; "TCE" = trichlorethene; "DCE" = dichloroethene.
- "U" = not detected above listed quantitation limit; "J" = reported concentration is an estimated value; "UJ" = reported quantitation limit is an estimated value; "R" = the data are unusable (analyte may or may not be present).
- "Dry" = well dry during monitoring event; "NA" = not applicable; "NS" = not sampled.
- All data are qualified based on the data validation report for each sampling event.
- Water Quality Standard referenced from Appendix C of "Vermont Water Quality Standards" (water and organisms) effective July 2, 2000.



TABLE 5.0
INDOOR AIR QUALITY RESULTS: 2008-2013
Bressett Site, Randolph, Vermont

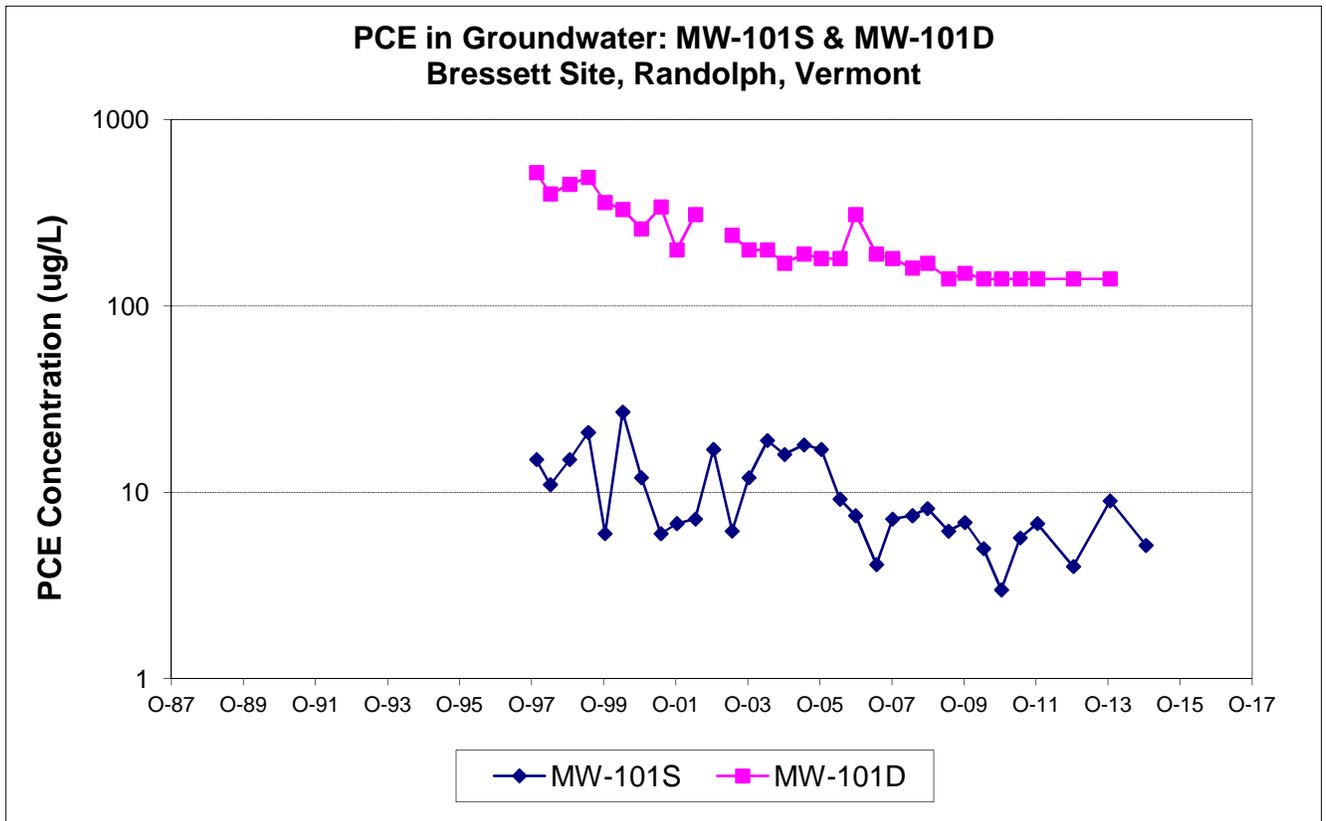
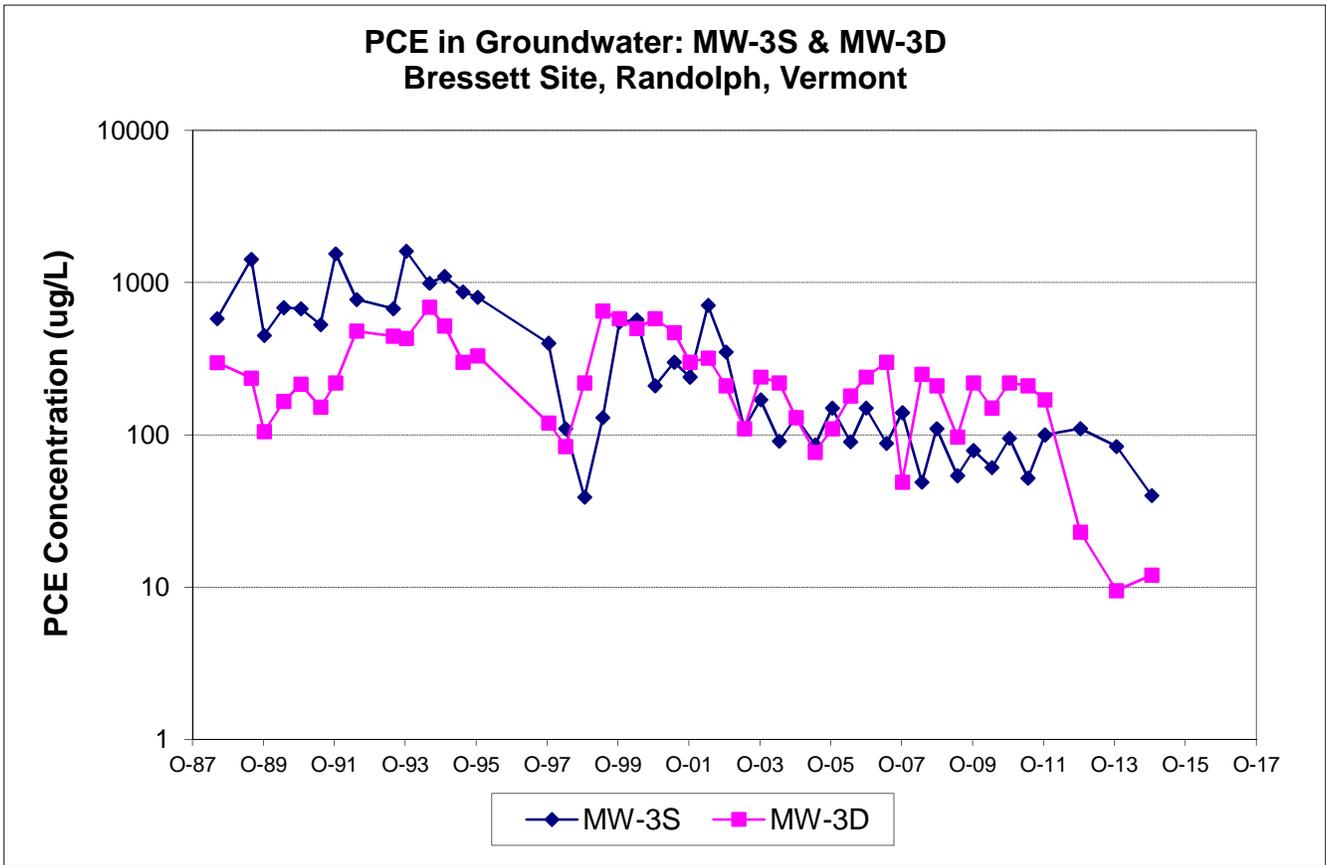
Current Owner	Location	Parameter Method T-014A	Guidance Level	Units	Jul-08	Jan-09	Jul-09	Feb-10	Jul-10	Jan-11	Jul-11	Jan-12	Aug-12	Feb-13	Aug-13
Vonner	BRST1FLR	Tetrachloroethene	0.08	ppbv	2.8	1.8	3.4	0.27	0.034 J	1.3	0.041	0.13	0.041	0.15	0.071
		Trichloroethene	0.09	ppbv	0.19	0.22	0.20	0.034	0.010 UJ	0.19	0.010 U	0.018	0.010 U	0.019	0.010 U
		cis-1,2-Dichloroethene		ppbv	0.040	0.13	0.055	0.025	0.010 UJ	0.16	0.010 U				
		trans-1,2-Dichloroethene	15.9	ppbv	0.010 U	0.013	0.010 U	0.010 U	0.010 U	0.015	0.010 U				
	BRSTBSMT	Tetrachloroethene	0.08	ppbv	4.4	2.6	9.1	0.82 J	0.21 J	4.8	0.24	0.32	0.16	0.19	0.11
		Trichloroethene	0.09	ppbv	0.30	0.33	0.55	0.084	0.029 J	0.65	0.035	0.037	0.027	0.025	0.015
		cis-1,2-Dichloroethene		ppbv	0.055	0.18	0.14 J	0.067	0.010 UJ	0.53	0.015	0.020	0.010 U	0.017	0.010 U
		trans-1,2-Dichloroethene	15.9	ppbv	0.011	0.018	0.016 J	0.010 U	0.010 U	0.047	0.010 U				

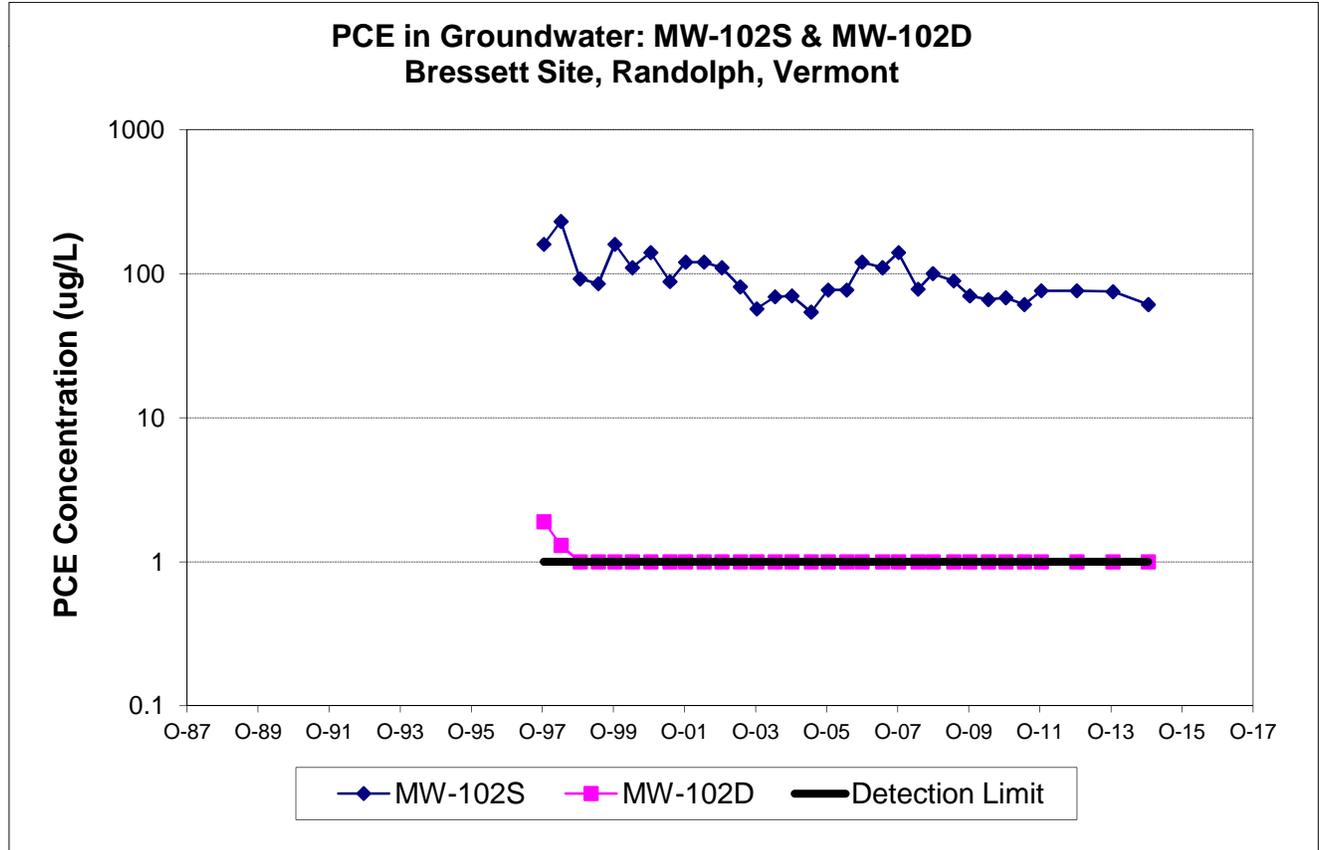
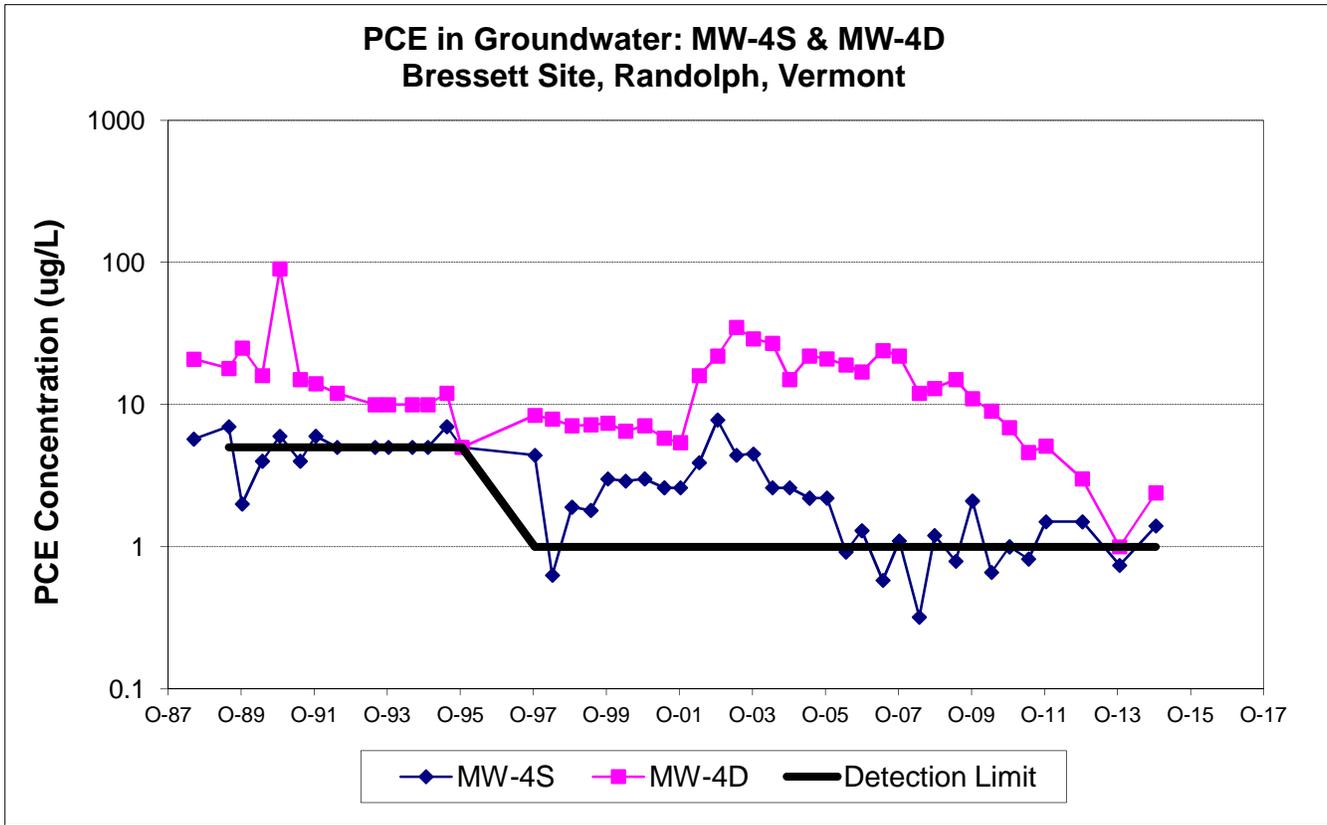
Notes:

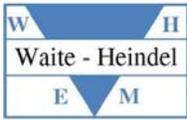
- "U" = not detected above listed quantitation limit; "J" = reported concentration is an estimated value; "UJ" = reported quantitation limit is an estimated value; "R" = the data are unusable (analyte may or may not be present).
- "NS" = Not Sampled (house unoccupied or access not obtained).
- Bold values are reported above quantitation limit; shaded cells are in excess of the guidance level.
- Guidance levels for tetrachloroethene and trichloroethene are Target Indoor Air concentrations from Table C.7 of VT ANR Investigation and Remediation of Contaminated Properties Procedure, April 2012. These values have been converted from ug/m3 to ppbv using the formula: concentration (ppbv) = concentration (ug/m3) * 24.46/MW @ 25 dec C.
- Guidance level for trans-1,2-dichloroethene is based on the EPA Regional Screening Level (RLS) for residential indoor air (May 2013). There is no EPA RSL for cis-1,2-dichloroethene.

APPENDIX C:

GRAPHS







APPENDIX D:
FIELD DATA SHEETS: 4TH QUARTER



Waite-Heindel
Environmental Management

UNIFIRST

FIELD WATER COLLECTION SHEET

SAMPLING LOCATION BRLW-3 Pump Intake Depth 70'

Date 10/20/14 Pump Type FlowLab

Sampler CA/SC Well Diameter 2"

Weather Cloudy 1-2 40's Well Depth 80.96

Water Type gw Initial Depth to Water 14.46

Sampling Method baller Traditional Purge Vol. / Rate 200 ad/m

supply grab

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/m) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
1041	4.30	200	9.08	268	7.07	299.8	11.34	15.71	200 ad/m, re 1 bar
1046	4.91	↓	9.14	218	6.11	239.4	7.53	18.40	
1047	18.25	↓	9.28	235	6.08	232.6	6.82	23.09	
1050	18.16	↓	9.17	294	6.13	225.5	7.29	22.17	
1053	15.14	↓	9.64	296	6.23	218.3	6.92	17.48	
1056	15.19	200	9.66	296	6.32	211.7	6.72	22.29	
1059	15.20	200	9.74	295	6.52	205.3	6.50	19.47	
1102	15.20	200	9.97	295	6.55	195.1	6.54	17.78	
1105	15.20	200	9.82	293	6.56	197.2	6.48	14.25	

SAMPLE COLLECTION

Purge Volume: 2.5 gal Temp.: 9.82 Specific Cond.: 293 pH: 6.56 ORP: 197.2 DO: 6.48 Turbidity: 14.25

Final Measurements: Type Container: 2.5 gal # Container: 3 Preservative: HCl Analysis Method: 8260 Collection Time: 1106 COC #

Sample Description: BRLW-3 Label: 40 ml Container: 3 HCl

Additional: Acetic acid

Field Duplicate

MS/MSD

Field Blank

General Notes:



Waite-Heindel
Environmental Management

UNIFIRST FIELD WATER COLLECTION SHEET

SAMPLING LOCATION BRW-2 Pump Intake Depth 7.5'

Date 10/20/14 Pump Type Geosub

Sampler CP/SC Well Diameter 2"

Weather Cloudy, low 40's Well Depth 101.5'

Water Type GW Initial Depth to Water 9.56'

Sampling Method bailer Traditional Purge Vol. / Rate 200 ml/min

within 3% 10 mv 1 pH unit within 10% within 10%

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/cm) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
1154	10.42	200	11.19	276	7.60	-99.7	4.04	25.67	220 mL/min
1157	12.37		10.11	507	7.06	-68.7	2.14	47.45	200 mL/min
1200	13.76		10.34	519	6.95	-77.9	1.33	54.25	gray silty
1203	15.07		10.02	475	6.95	-85.9	1.06	46.07	
1206	16.33		9.93	420	6.97	-91.4	0.87	59.62	↑ sulphur odor
1209	17.98		9.98	378	7.03	-93.2	0.70	55.82	
1212	18.88		10.06	368	7.14	-63.2	0.63	63.81	
1215	19.95		10.50	353	7.36	-111.4	0.55	53.01	
1219	20.94		10.48	352	7.47	-112.0	0.51	51.15	
1221	21.65		10.53	342	7.47	-119.4	0.49	49.81	
1224	21.96		10.52	338	7.42	-120.5	0.49	50.22	180 mL/min

SAMPLE COLLECTION

Final Measurements: Purge Volume 325 ml Temp. 10.52 Specific Cond. 338 pH 7.42 ORP -120.5 DO 0.49 Turbidity 50.22

Sample Description	Label	Purge Volume	Temp. #	Specific Cond.	pH	ORP	DO	Turbidity	Analysis Method	Collection Time	COC #
Sample	<u>BRW-2</u>	<u>40 ml</u>	<u>3</u>	<u>HCl</u>					<u>8260</u>	<u>1026</u>	
Additional											
Additional											
Field Duplicate											
MS/MSD											
Field Blank											

General Notes:



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Environmental Management

UNIFIRST FIELD WATER COLLECTION SHEET

SAMPLING LOCATION BRW-1 Pump Intake Depth 40

Date 10/20/14 Pump Type Bessb

Sampler CP/SC Well Diameter 2"

Weather cloudy, low HO's Well Depth 80.8

Water Type sw Initial Depth to Water 15.47

Sampling Method gw Traditional Purge Vol. / Rate 200 mL/min

low flow supply grab

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/m) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
1310	15.95	200	9.20	176	7.81	86.6	8.82	11.25	
1313	16.03	↓	8.86	174	7.21	90.7	6.30	15.35	clear
1316	16.14	↓	8.78	173	6.87	110.4	5.43	8.08	no odor
1319	16.24	↓	8.85	172	6.86	112.6	5.01	5.77	
1322	16.71	↓	8.81	172	6.97	105.0	4.82	6.10	
1325	17.00	↓	8.66	172	7.04	103.8	4.62	5.72	
1328	17.18	↓	8.64	172	7.04	106.3	4.55	2.33	

SAMPLE COLLECTION		Purge Volume	Temp.	Specific Cond.	pH	ORP	DO	Turbidity
Sample Description	Label	Type Container	# Container	Preservative	Analysis Method	Collection Time	COC #	
Final Measurements:		25 gal	8.64	172	7.04	106.3	4.55	2.33
Sample	BRW-1	40 mL	3	HCl	8260	1330		
Additional								
Additional								
Field Duplicate								
MS/MSD								
Field Blank								

General Notes:

WEM Project #110320012

VT DEC Site #



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Environmental Management

UNIFIRST FIELD WATER COLLECTION SHEET

SAMPLING LOCATION MW-103D Pump Intake Depth 20'

Date 10/21/14 Pump Type Peri

Sampler CP/SC Well Diameter 1"

Weather Rainy, low 40's Well Depth 21.55

Water Type (gw) sw supply Initial Depth to Water 13.20

Sampling Method bailer (low flow) grab Traditional Purge Vol. / Rate 200 mL/min

LOW FLOW PURGING DATA

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/m) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
0846	16.10	100	9.85	219	6.78	200	6.60	2100	very silty
0849	16.37	↓	9.90	219	7.12	-8.0	7.37	↓	
0854	16.50	↓	9.85	216	7.91	-12.2	1.40	↓	No odor
0859	16.71	↓	9.77	210	7.56	-14.9	0.98	↓	
0904	16.77	↓	9.71	200	7.65	-15.0	0.75	↓	
0909	16.85	↓	9.71	188	7.69	-16.7	0.63	↓	
0914	17.00	↓	9.67	183	7.73	-16.4	0.56	↓	
0919	17.00	↓	9.64	177	7.75	-16.9	0.51	↓	

SAMPLE COLLECTION

Sample Description	Label	Type	#	Container	Temp.	Specific Cond.	pH	ORP	DO	Turbidity	COC #
Final Measurements:		2.5 gal	1	1.64	177	Preservative	7.75	-16.9	0.51	2100	
Sample	MW-103D	40 mL	3			HCl		8260			
Additional											
Additional											
Field Duplicate											
MS/MSD											
Field Blank											
General Notes:											

UNIFIRST FIELD WATER COLLECTION SHEET

SAMPLING LOCATION MW-104 S Pump Intake Depth 8'

Date 10/21/14 Pump Type Peru

Sampler CP/SC Well Diameter 1"

Weather Rainy, low 40's Well Depth 8.90

Water Type (gw) Initial Depth to Water 1.82

Sampling Method bailer Traditional Purge Vol. / Rate 200 ml/min

10 mv within 10% within 10% within 10%

Time	DTW (ft. btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/cm) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
0952	1.93	200	11.40	339	7.00	+134.6	12.56	197.3	
0955	1.95		11.42	342	7.11	-64.3	5.30	36.20	
0958	1.95		11.52	343	7.23	-25.7	5.11	35.11	
1001			11.60	342	7.15	-20.6	5.03	19.94	
1004			11.64	342	7.11	22.4	4.94	13.19	
1007			11.66	342	7.07	51.1	4.81	6.49	
1011			11.67	342	7.04	76.4	4.89	5.01	
1014			11.70	342	7.02	87.9	4.83	5.32	
1017			11.71	342	7.01	108.4	4.82	5.61	
1020			11.71	342	7.02	119.5	4.79	5.33	

SAMPLE COLLECTION

Purge Volume 2.5 gal Temp. 11.71 Specific Cond. 342 pH 7.02 ORP 119.5 DO 4.79 Turbidity 5.33

Final Measurements: Label MW-104S Type 40ml Container 3 Preservative HCl Analysis Method 8260 Collection Time 1021 COC #

Sample Description: Additional, Additional, Field Duplicate, MS/MSD, Field Blank

General Notes:



Waite-Heindel
Environmental Management

UNIFIRST FIELD WATER COLLECTION SHEET

SAMPLING LOCATION MW-102D

Date 10/24/14
 Sampler LP/S/L
 Weather Rainy, low 40's
 Water Type (gw) sw supply
 Sampling Method bailer (low flow) grab

Pump Intake Depth 32'
 Pump Type Pesi
 Well Diameter 1"
 Well Depth 33.19
 Initial Depth to Water 8.66
 Traditional Purge Vol. / Rate 200 ml/min

LOW FLOW PURGING DATA

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/cm) / (us/cm)	1 pH unit		10 mv		within 10%		Notes
					pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)			
1113	12.47	160	9.65	300	7.36	-55.9	6.41	160.5			
1116	12.81	↓	9.37	299	7.42	-92.1	2.23	99.12			
1119	12.69	↓	9.31	299	7.41	-107.6	1.45	96.66			
1122	12.53	200	9.22	300	7.45	-113.0	1.22	96.28			
1125	13.29	↓	9.07	300	7.50	-119.3	1.03	86.76			
1128	13.30	↓	9.00	299	7.49	-126.2	0.87	86.64			
1131	13.37	↓	8.95	299	7.50	-128.7	0.78	82.11			
1134	13.45	↓	8.90	300	7.53	-128.2	0.74	80.27			
1137	13.64	↓	8.86	300	7.56	-130.8	0.73	78.74			

SAMPLE COLLECTION

Sample Description	Label	Purge Volume	Temp.	Specific Cond.	pH	ORP	DO	Turbidity	COC #
Final Measurements:		2.5	8.96	300	7.56	-130.8	0.73	78.74	

Sample Description	Type	Container	#	Preservative	Analysis Method	Collection Time
Sample <u>MW-102D</u>	<u>40 ML</u>	<u>3</u>		<u>HCl</u>	<u>8260</u>	<u>1138</u>
Additional						
Additional						
Field Duplicate						
MS/MSD						
Field Blank						

General Notes:



Waite-Heindel
Environmental Management

UNIFIRST

FIELD WATER COLLECTION SHEET

SAMPLING LOCATION MW-1025 Pump Intake Depth: 14.5

Date: 10/24/06 Pump Type: per

Sampler: CPSC Well Diameter: 3/4"

Weather: rainy, cold Well Depth: 15.60

Water Type: gw sw low flow supply grab

Sampling Method: bailer Initial Depth to Water: 8.55

Traditional Purge Vol. / Rate: 200

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/cm) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
1157	9.11	200	10.20	345	7.45	-11.6	8.58	40.07	<u>Clear No. 0</u>
1159	9.12		10.17	345	7.55	-11.4	7.50	11.42	
1157	9.12		10.16	347	7.50	3.3	6.95	5.80	<u>Clear</u>
1200			10.16	347	7.51	11.1	6.88	4.32	
1203			10.15	347	7.00	17.1	6.81	8.65	
1206			10.14	347	7.48	23.7	6.84	1.74	
1209			10.13	347	7.48	27.0	6.78	1.32	<u>Stable</u>

SAMPLE COLLECTION

Sample Description	Label	Purge Volume	Temp.	Specific Cond.	pH	ORP	DO	Turbidity	COC #
Final Measurements:		1.5 gal	10.13	347	7.48	27.0	6.78	1.32	
Sample	MW-102	VOA	3	Preservative		Analysis Method		Collection Time	
Additional				HCL		8260		1210	
Additional									
Field Duplicate									
MS/MSD									
Field Blank									

General Notes:



Waite-Heindel
Environmental Management

UNIFIRST FIELD WATER COLLECTION SHEET

SAMPLING LOCATION MW-101S

Date 10/21/14

Sampler CP/sc

Weather rainy, cold

Water Type GW SW low flow supply grab

Sampling Method bailer

Pump Intake Depth 11.9

Pump Type peri

Well Diameter 3/4"

Well Depth 13.14

Initial Depth to Water 6.25

Traditional Purge Vol. / Rate 7.5

LOW FLOW PURGING DATA

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/m) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
1401	7.90	120	12.98	358	6.80	120.6	8.12	---	
1404	7.85	100	12.91	365	6.69	125.7	3.54	3709	broken, 8'11"
1407	7.85		12.83	367	6.53	119.3	2.09	344.0	
1410			12.85	366	6.47	117.2	1.84	268.8	No odor
1413			12.83	367	6.42	115.0	1.58	117.3	
1416			12.85	366	6.38	113.0	1.36	63.07	clear
1419			12.85	366	6.36	111.8	1.28	64.40	
1422			12.80	366	6.34	111.1	1.26	69.03	stable

SAMPLE COLLECTION

Sample Description	Label	Purge Volume	Temp.	Specific Cond.	pH	ORP	DO	Turbidity	COC #
Final Measurements:		1.5 gallons	12.80	366	6.34	111.1	1.26	69.03	

Sample Description	Label	Type	Container	#	Preservative	Analysis Method	Collection Time
Sample	MW-101S	VOA		3	HCL	8260	1424
Additional							
Additional							
Field Duplicate	MW-2	VOA		3	HCL	8260	"1200"
MS/MSD							
Field Blank							

General Notes:



Waite-Hendel
Environmental Management

UNIFIRST

FIELD WATER COLLECTION SHEET

SAMPLING LOCATION MW-45 Pump Intake Depth 23.3

Date 10/21/14 Pump Type per

Sampler CMSC Well Diameter 2"

Weather Sunny, Clearing Well Depth 24.57

Water Type sw Initial Depth to Water 2.44

Sampling Method grab Traditional Purge Vol. / Rate 200

LOW FLOW PURGING DATA

Time	DTW (ft btp)	Purge Rate (ml/min)	Temp. (deg C)	Specific Cond. (ms/cm) / (us/cm)	pH	ORP (mv)	DO (mg/L)	Turbidity (NTU)	Notes
1449	21.39	200	9.06	68	6.89	119.4	9.30	1025	Clear, No odor
1452	21.53		8.90	69	6.70	129.1	8.92	7.35	
1455	21.62		8.89	69	6.56	134.5	8.56	7.10	
1458	21.73		8.85	70	6.48	137.2	8.46	9.76	
1501	21.81		8.82	70	6.43	139.3	8.48	5.93	
1504	21.91		8.79	73	6.38	140.8	8.44	3.59	
1507	21.97		8.74	76	6.35	142.2	8.31	2.49	

SAMPLE COLLECTION

Sample Description	Label	Purge Volume	Temp.	Specific Cond.	pH	ORP	DO	Turbidity	COC #
Final Measurements:		1.58	8.74	76	6.35	142.2	8.31	2.49	
Sample Description	MW45	VOA	# Container	Preservative	Analysis Method	Collection Time			
Sample	MW45	VOA	3	AUC	8260	1508			
Additional									
Additional									
Field Duplicate									
MS/MSD	MW45	VOA	4	AUC	8260	1508			
Field Blank									

General Notes:



APPENDIX E:

DATA VALIDATION REPORT: 4TH QUARTER



January 28, 2015

Mr. Gerold Noyes
VT Department of Environmental Conservation
Waste Management and Prevention Division
1 National Life Drive - Davis 1
Montpelier, VT 05620-3704

Reference #: 2014-1117-001, -1121-001, and -1223 -001

Dear Gerold,

Attached please find the results of the data validation of Sample Delivery Group (SDG) Nos. BRES59, UNIF51, UNIF52, and WHEA20 from the Environmental Monitoring work at the Bressett Site, in Randolph, the UniFirst Site in Williamstown, and the Wheatley Farm site in Brookfield, VT. No air samples were collected for this sampling round; the water samples in these SDGs were collected on October 20, 21, 22, and 23, 2014, and sample SP-4 collected on November 21, 2014 due to the necessity of removing pavement that the homeowner had applied over the well access. The laboratory analyses were performed by TestAmerica Burlington (formerly STL Burlington) of South Burlington, VT.

The data packages were received on November 17 and 21, and December 23, 2014. The validation has been performed by Phoenix Chemistry Services, to the extent possible according to the Tier III guidelines as defined by USEPA Region I, as presented in "Region I EPA-NE Data Validation Manual and Functional Guidelines for Evaluating Environmental Analyses", December, 1996. The EPA's National Functional Guidelines for Organic Data Review (EPA 540/R-99/008, October, 1999), and the Field/Laboratory Coordination Memorandum for Water Monitoring (FLCM), June 25, 2013 were also considered during the evaluation, and professional judgment was applied as necessary and appropriate. Data qualifiers have been applied in the final validation report as necessary and appropriate, in accordance with these guidelines.

Electronic copies of these reports are being submitted to Waite Environmental Management and TestAmerica Burlington, as well as to your attention. The year-end quality assurance summary report for air and water analyses will be submitted soon under separate cover.

Thank you for this opportunity to provide data validation services to the Waste Management Division. We look forward to continuing to work with you. If there are any questions or concerns about the material in this report, please do not hesitate to contact me for help and clarification.

Sincerely,

Deborah H. Gaynor, Ph.D.
Principal, Phoenix Chemistry Services

DATA VALIDATION

FOR

**UniFirst Project
Bressett, Wheatley, and UniFirst Sites
Randolph, Brookfield, and Williamstown, VT**

**ORGANIC ANALYSIS DATA
Volatile Organics in Water Samples**

Sample Delivery Group Nos. BRES59, UNIF51, WHEA20, and UNIF52

Chemical Analyses Performed by:

**TestAmerica Burlington
30 Community Drive Dr. Suite 11
South Burlington, VT 05403**

FOR

**Mr. Gerold Noyes
Department of Environmental Conservation
Waste Management and Prevention Division
1 National Life Dr – Davis 1
Montpelier, VT 05620-3704**

Data Validation Report by:

**Phoenix Chemistry Services
126 Covered Bridge Rd.
N. Ferrisburgh, VT 05473
(802)-233-2473**

January 26, 2015

Reference #s 2014-1117-001, 1121-001, &-1223-001
VOA Validation Report/BRES59_UNIF51_52_WHEA20/dpd/dhg

EXECUTIVE SUMMARY

Phoenix Chemistry Services (Phoenix) has completed the validation of the volatile organics analysis data prepared by TestAmerica Burlington (formerly STL Burlington) for 39 groundwater samples, 8 potable water samples, 1 performance evaluation (PE) sample, 5 field blanks (FB), and 6 trip blanks (TB) from the Bressett Site in Randolph, VT, the UniFirst Site in Williamstown, VT, and the Wheatley Farm site in Brookfield, VT. The laboratory reported the data under Sample Delivery Group (SDG) Nos. BRES59, UNIF51, UNIF52, and WHEA20 which were submitted as four data packages received by Phoenix on November 17, November 21, and December 23, 2014. These SDGs include the following samples:

Table 1. Sample Identifications

Sample Identifier	Laboratory ID
<i>Method 8260B</i>	
<i>SDG No. BRES59</i>	
TB-2	200-24909-1
MW-103RD	200-24909-2
MW-104S	200-24909-3
MW-104D	200-24909-4
MW-102D	200-24909-5
MW-102S	200-24909-6
MW-101S	200-24909-7
MW-Z	200-24909-8
MW-4S	200-24909-9
MW-4D	200-24909-10
MW-3S	200-24909-11
MW-3D	200-24909-12
TB-1	200-24910-1
BRW-3	200-24910-5
BRW-2	200-24910-6
BRW-1	200-24910-7
<i>SDG No. UNIF51</i>	
MW-25884	200-24910-8
BRW-Z	200-24910-9
FB-2	200-24910-10
W-19	200-24934-1
PZ-101	200-24934-2
PZ-102	200-24934-3
W-25	200-24934-4
MW-50	200-24934-5
W-Z	200-24934-7
MW-C	200-24934-6
MW-E	200-24934-8
W-1	200-24934-9
W-20	200-24934-10
MW-D	200-24934-11

Sample Identifier	Laboratory ID
FB-4	200-24934-12
TB-3	200-24934-13
SS-2	200-24981-9
SS-5	200-24981-10
W-SEEP	200-24981-11
SEEP-1A	200-24981-12
SP-MW3	200-24981-13
SS-Z	200-24981-14
<i>SDG No. WHEA20</i>	
TB-4	200-24977-1
FB-5	200-24977-2
MW-PL2	200-24977-3
MW-S1	200-24977-4
MW-S2	200-24977-5
MW-PL1	200-24977-6
MW-PLX	200-24977-7
<i>SDG No. UNIF52</i>	
TRIP BLANK	200-25551-1
SP-4	200-25551-2
<i>Method 524.2</i>	
<i>SDG No. BRES59</i>	
SHIELDS	200-24910-2
WELL Z	200-24910-3
FB-1	200-24910-4
<i>SDG No. UNIF51</i>	
TB-5	200-24981-1
FB-6	200-24981-2
WP-7	200-24981-3
WP-8	200-24981-4
WP-13	200-24981-5
WP-3	200-24981-6
WP-Z	200-24981-7
WP-5	200-24981-8
WP-23	200-24981-15

Sample MW-103RD was originally identified as MW-103D on the Chain of Custody received on November 17, 2014. This well has been renamed MW-103RD to identify it as a re-drilled well. The correct identifier has been used throughout this report and in the validated spreadsheet files.

Monitoring well SP-4 was paved over by the homeowner. The field engineer returned to the site to break through the pavement and sample this well on 11/21/14.

Findings of the validation effort resulted in the following qualifications of sample results:

- Results for all non-detected aromatic compounds in MW-103RD were rejected (R).

- Results for chloromethane in SP-4 and TRIP BLANK were qualified as estimated (UJ).
- Results for acetone in samples TB-2, MW-103RD, MW-104S, MW-104D, MW102D, MW-102S, MW-101S, MW-Z, MW-4S, MW-4D, MW-3S, MW-3D, TB-1, FB-2, BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, and TB-3, and for bromomethane in BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, TB-3, W-19, PZ-101, PZ-102, W-25, SS-2, SS-5, W-SEEP, SEEP-1A, SP-MW3, SS-Z, TB-4, FB-5, MW-PL2, MW-S1, MW-S2, MW-PL1, and MW-PLX, all as analyzed by Method 8260B, were qualified as estimated (UJ).
- Results for acetone in TB-5, FB-1, SHIELDS, FB-6, WP-7, WP-8, WP-3, and WP-Z, and for methylene chloride in FB-1, FB-6, and WP-7 were qualified as less than the quantitation limit (U).
- Results for bromomethane in MW-4S, W-1, W-SEEP, and MW-S2; for carbon disulfide, cis-1,2-dichloroethene, chloroform, 1,1,1-trichloroethane, toluene, m&p-xylene, o-xylene, total xylenes, vinyl chloride, 1,1-dichloroethene, methylene chloride, 4-methyl-2-pentanone, dibromochloromethane, and bromoform in MW-4S; and for vinyl chloride in MW-S2 were qualified as estimated (UJ).
- Non-detected results for methylene chloride in samples TRIP BLANK and SP-4 were qualified as estimated (UJ).
- Results for chloromethane in TB-2, MW-103RD, MW-104S, MW-104D, MW-102D, MW-102S, MW-101S, MW-Z, MW-4S, MW-4D, MW-3S, MW-3D, TB-1, and FB-2; for vinyl chloride in BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, and TB-3, and the result for methylene chloride in MW-PLX were qualified as estimated (UJ), and results for all analytes in TRIP BLANK and SP-4 were qualified as estimated (J,UJ).
- The laboratory appropriately applied “J” qualifiers to the sample Form I’s when the concentration of an analyte was less than the sample-specific PQL. The validator did not remove these qualifiers.
- All laboratory-specific qualifiers, such as the asterisk (*), have been removed by the validator.

The Overall Evaluation of Data (Section XVI) summarizes the validation results. The validation findings and conclusions for each analytical parameter are detailed in the remaining sections of this report.

Documentation problems observed in the data packages are described in Section XVII.

This validation report shall be considered part of the data packages for all future distributions of the volatiles (8260B and 524.2) analysis data.

INTRODUCTION

Analyses were performed according to SW-846 Method 8260B Low Level, as documented in TestAmerica SOP BR-MV-005r8, and SDWA Method 524.2 Rev. 4.1, as documented in TestAmerica SOP BR-MV-005r11, and in accordance with requirements in the Field/Laboratory Coordination Memorandum for Water Monitoring (FLCM), June 25, 2013. The target compound list for the Method 8260B analyses was limited to the OLM03.1 CLP target compound list, and the target compound list for Method 524.2 was limited to the OLM03.1 CLP target compound list plus methyl-*tert*-butyl ether (MTBE).

Tentative identification of non-target analyte peaks (i.e., tentatively identified compounds, or TICs) was not requested for these analyses.

Phoenix Chemistry Services' validation was performed in conformance with Tier III guidelines as defined by USEPA Region I in the "Region I EPA-NE Data Validation Manual: The Data Quality System", (12/96 Revision). To maintain consistency with previous work at these sites, the data were evaluated in accordance with the "Region I EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses", December 1996. EPA's National Functional Guidelines for Organic Data Review (EPA 540/R-99/008, October, 1999) were also considered during the evaluation, and professional judgment was applied as necessary and appropriate.

The data validation process evaluates data on a technical basis for chemical analyses conducted under the CLP or other well-defined methods. Contract compliance is evaluated only in specific situations. Issues pertaining to contractual compliance are noted where applicable. It is assumed that the data package is presented in accordance with the CLP (CLP-like or SW-846) requirements. It is also assumed that the data package represents the best efforts of the laboratory and has already been subjected to adequate and sufficient quality review prior to submission for validation. In instances where SW-846 or other specific methods have been used for the analyses, the validation effort is modified to acknowledge the differences in methodology while maintaining the goals and quality objectives of the CLP.

Results of sample analyses are reported by the laboratory as either qualified or unqualified; various qualifier codes are used by the laboratory to denote specific information regarding the analytical results. During the validation process, laboratory data are verified against all available supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data validator. Raw data is examined in detail to check calculations, compound identification, and/or transcription errors. Validated results are either qualified or unqualified; if results are unqualified, this means that the reported values may be used without reservation. Final validated results are annotated with the following codes, as defined in the EPA Region I Functional Guidelines:

- U - The analyte was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit. The sample quantitation limit accounts for sample specific dilution factors and percent solids corrections or sample sizes that deviate from those required by the method.
- J - The associated numerical value is an estimated quantity.
- UJ - The analyte was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

R - The data are unusable (analyte may or may not be present). Resampling and reanalysis is necessary for verification. The R replaces the numerical value or sample quantitation limit. In some instances (e.g., a dilution) a result may be indicated as “rejected” to avoid confusion when a more quantitatively accurate result is available.

EB, TB, BB - An analyte that was identified in an aqueous equipment (field) blank, trip blank, or bottle blank that was used to assess field contamination associated with soil/sediment samples. These qualifiers are to be applied to soil/sediment sample results only.

These codes are assigned during the validation process and are based on the data review of the results. They are recorded in the Data Summary Table contained in Attachment A and the spreadsheet summary files (Attachment B, submitted electronically) of this validation report.

All data users should note two facts. First, **the "R" qualifier means that the laboratory-reported value is completely unusable.** The analysis is invalid due to significant quality control problems, and provides no information as to whether the compound is present or not. Rejected values should not appear on data tables because they have no useful purpose under any circumstances. Second, **no analyte concentration is guaranteed to be accurate even if all associated quality control is acceptable.** While strict quality control conformance provides well-defined confidence in the reported results, any analytical result will always contain some error.

The user is also cautioned that the validation effort is based on the materials provided by the laboratory. Software manipulation, resulting in misleading raw data printouts, cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

Detailed Findings of Measurement Error Associated with the Analytical Analysis

I. Preservation and Technical Holding Times (Sample Integrity)

The samples for volatiles analysis in SDG Nos. BRES59, UNIF51, and WHEA20 were collected on October 20, 21, 22, and 23, 2014, and the samples in SDG No. UNIF52 were collected on November 21, 2014. All volatiles analyses were performed within the acceptable holding times for preserved water samples (14 days from collection), as required by Region 1. The pH of the samples was measured at the time of screening, and is recorded in the Sample Preparation sections of the data packages and noted in the Case Narrative. Vial preservation with hydrochloric acid is noted by the field sampler in all field sheets. The pH of the vial analyzed is also measured immediately following analysis. All recorded sample pH values were <2 with the exception of MW-103RD, which had a post-analysis pH of 7. Due to the use of a non-preserved sample vial for analysis, and analysis 11 days following sample collection, results for all non-detected aromatic compounds in MW-103RD were rejected (R), while results for non-aromatic compounds were accepted.

The cooler temperatures on receipt at the laboratory were checked and documented in the data packages, and were 0.4, 3.2, 5.8, 5.4, 5.0, and 3.6 °C, which are within the acceptance range of 4 °C ±2 °C.

Only one vial each was submitted for TB-2 and FB-3 due to an error by the sampler. The laboratory consumed the single vial for FB-3 during screening, so no results were submitted for this sample. The laboratory did not screen TB-2 and results are included in the data packages.

The field data sheets and Chain of Custody incorrectly identified sample MW-103RD as MW-103D. This well has been renamed to MW-103RD to identify that it was re-drilled. The correct identifier has been used throughout this report and in the validated spreadsheet files.

II. GC/MS Instrument Performance Check (Tuning)

The samples were analyzed on one GC/MS system identified as instrument CHL. The tuning of this instrument was demonstrated with analysis of 4-bromofluorobenzene (BFB); tunes were analyzed for each shift (12-hour period) during which the samples or associated standards were analyzed. All eleven (11) BFB tunes were correctly calculated, within acceptance limits, and are reported accurately on the Form V summaries in the data packages.

III. Initial Calibration (IC)

Two ICs (10/30/14, and 11/10/14) were performed on instrument CHL in support of the Method 8260B sample analyses, and one IC (10/23/14) was performed on instrument CHL in support of the Method 524.2 sample analyses reported in these data packages. Documentation of all individual IC standards was present in the data packages and relative response factor (RRF) as well as percent relative standard deviation (%RSD) values were correctly calculated and accurately reported on the Form VI summaries.

No target compounds were manually integrated in the ICs and CCs performed for this data set.

All % RSDs for both ICs were below the maximum limit (30%) specified by Region I, and all RRF's were above the 0.05 minimum technical criterion, with the following exceptions:

Table 2. Initial Calibration Exceedances

Instrument	IC	Average RRF	
		acetone	2-butanone
CHL (524.2)	10/23/14	0.0496	0.0186

Pursuant to the Region I validation document, results for acetone and 2-butanone in all samples analyzed by Method 524.2 in this data set warranted rejection (R) based on the low RRFs achieved. However, acetone and 2-butanone were spiked at a concentration of 5 µg/L in the matrix spikes, matrix spike duplicates, laboratory control samples, and laboratory control sample duplicates for method 524.2 in this data set, and acceptable recoveries for this compound were achieved in these analyses. Therefore, results for acetone and 2-butanone were not qualified on the basis of the low RRFs in the associated IC on this instrument.

An ICV was analyzed immediately after each IC, as required, and recoveries were correctly calculated and accurately reported as percent differences (%D) in the data packages. All percent differences in the submitted ICVs were within laboratory established control limits (± 25 %D for Method 8260B and ± 30 %D for Method 524.2), and Region 1 limits for continuing calibrations (± 25 %D), with the exception of chloromethane, which exhibited 30.6 %D in the Method 8260B ICV analyzed on 11/10/14.

On the basis of the unacceptably high percent difference result in the associated ICV, results for chloromethane in SP-4 and TRIP BLANK were qualified as estimated (UJ).

IV. Continuing Calibration (CC)

Five continuing calibration (CC) standards were analyzed in support of the Method 8260B sample analyses, and three CC standards were analyzed in support of the Method 524.2 sample analyses reported in this data set. Documentation of the CC standards was present in the data packages and RRF as well as percent difference (%D) values were correctly calculated and accurately reported on the Form VII summaries within the data packages.

The maximum limit for %D in the CC standard allowed by Region 1 is ± 25 %. All %D results were below this limit for the CC standards analyzed by Method 8260B with the following exceptions:

- acetone exhibited a -33.1, and -26.5 %D in the CC standards analyzed on 10/31/14 at 14:22, and on 11/1/14 at 07:18;
- bromomethane exhibited a -47.7, -55.0, and -51.6 %D in the CC standards analyzed on 11/1/14 at 07:18, 11/2/14 at 16:40, and on 11/3/14 at 07:07;

All RRFs were above the 0.05 minimum criterion in all CC standards for Method 8260B.

All %D results were below ± 25 % for the CC standards analyzed by 524.2.

All RRFs for Method 524.2 CC standards were above the 0.05 minimum criterion with the exception of 2-butanone in all CC standards (range: 2-butanone, 0.0169 - 0.0191), and in acetone in the CC standards analyzed on 10/27/14 and 10/28/14 (0.0470 and 0.0481, respectively).

On the basis of the unacceptable %D values in the associated CC standards, non-detect results for acetone in samples TB-2, MW-103RD, MW-104S, MW-104D, MW102D, MW-102S, MW-101S, MW-Z, MW-4S, MW-4D, MW-3S, MW-3D, TB-1, FB-2, BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, and TB-3 were qualified as estimated (UJ). On the basis of the unacceptable %D value in the associated CC standards, results for bromomethane in samples BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, TB-3, W-19, PZ-101, PZ-102, W-25, SS-2, SS-5, W-SEEP, SEEP-1A, SP-MW3, SS-Z, TB-4, FB-5, MW-PL2, MW-S1, MW-S2, MW-PL1, and MW-PLX were qualified as estimated (UJ). For the reasons discussed in Section III, no results for 2-butanone were qualified on the basis of the low RRFs in the associated ICs and CCs.

It should be noted that negative % difference values will result in a low bias for positive detects, and a positive % difference will result in a high bias for positive detects.

V. Blanks

Results for five (5) water-matrix laboratory method blanks (MBs) were reported in support of the Method 8260B and three MBs were reported in support of the Method 524.2 sample analyses. No target compounds were detected in any MB for either method with the following exceptions:

Table 3. Method Blank (MB) Detections

Method Blank ID	Analyte	Concentration (ug/L)	Reporting limit (ug/L)	Action limit (ug/L)
Method 524.2				
MB 200-79351	methylene chloride	0.0983	0.50	See MB 200-79437
MB-200-79437	methylene chloride	0.105	0.50	1.05
MB 200-79802	methylene chloride	0.0847	0.50	See MB 200-79437
	acetone	2.31	5.0	23.1

Six trip blanks (TBs) were reported in these SDGs; five for Method 8260B analysis and one for Method 524.2 analysis. No target compounds were detected in any TB in this sample set with the exception of acetone at 0.97 ug/L in TB-5. No trip blank was submitted with the samples collected on 10/20/14 for Method 524.2 analysis. No target compounds were detected in either of the two trip blanks submitted for Method 8260B analysis.

Five field blanks (FBs) were reported in these SDGs; three were analyzed by Method 8260B and two by Method 524.2. No target analytes were detected in any FB with the following exceptions:

Table 4. Field Blank (FB) Detections

Field Blank ID	Analyte	Concentration (ug/L)	Reporting limit (ug/L)	Action limit (ug/L)
Method 524.2				
FB-1	acetone	1.2	5.0	See MB 200-79802
	methylene chloride	0.108	0.50	See MB 200-79437
FB-6	acetone	1.1	5.0	See MB 200-79802
	methylene chloride	0.084	0.50	See MB 200-79437

Six holding (storage) blanks (HBs) were reported in these SDGs; four were analyzed by Method 8260B and two by Method 524.2. No target analytes were detected in any HB for either method with the following exceptions: acetone was detected below the reporting limit in both holding blanks for Method 524.2. The holding blank identified as 200-24910-12 reported acetone at 0.98 ug/L, and the holding blank identified as 200-24981-16 reported acetone at 1.8 ug/L.

No target compounds were detected in any blanks analyzed by Method 8260B in these data packages, including method blanks, trip blanks, field blanks and holding blanks. Acetone and/or methylene chloride were present in every blank analyzed by Method 524.2, including method blanks, trip blanks, field blanks and holding blanks. Additionally, a false positive for acetone was reported in the PES sample also analyzed by Method 524.2. The validator suspects wide spread laboratory contamination as the source of acetone and/or methylene chloride in the field, storage, and holding blanks, as a false positive in the PES, and also in the method blanks. Because acetone and methylene chloride are recognized as common laboratory contaminants, the action limit for these analytes is ten times the highest amount found in associated blanks.

On the basis of laboratory contamination exhibited in method and storage blanks, results for acetone in TB-5, FB-1, SHIELDS, FB-6, WP-7, WP-8, WP-3, and WP-Z were qualified as less than the quantitation limit (U). On the basis of laboratory contamination, results for methylene chloride in FB-1, FB-6, and WP-7 were qualified as less than the quantitation limit (U).

VI. Surrogate Compounds

Percent recoveries (%R) for all surrogate compounds in Method 8260B were correctly calculated, accurately reported on the Form II summaries within the data packages, and were within acceptance limits for all sample analyses.

Surrogate recoveries were reported for Method 524.2 analysis in the surrogate summary reports in the data summary sections of the data packages. The laboratory SOP includes four surrogate compounds, and these were present in all sample analyses; however, they were reported in the same manner as internal standard compounds (on the Form VIII) in the raw data sections of the data packages.

The surrogate compounds in the Method 524.2 sample analyses were evaluated from the Form VIII area responses, and were within the acceptance criteria established by the laboratory SOP ($\pm 30\%$ of the area response in the associated continuing calibration standard). The laboratory SOP also defines recovery criteria relative to the associated initial calibration ($\pm 30\%$ of the ion area for that analyte in the IC; it is not specified whether average area or from the mid-point of the initial calibration).

VII. Internal Standards (IS)

All IS areas and retention times (RT) were within the established QC limits for all reported sample analyses in these data packages for both 8260B and 524.2 analysis.

VIII. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Samples MW-4S, W-1, W-SEEP, and MW-S2 were used for the Method 8260B MS/MSD analyses in this data set, and samples WP-8 and SHIELDS were used for the Method 524.2 MS/MSD

analyses. The spiking solutions for both methods contained all target compounds at 1 µg/L (except for the ketones at 5 µg/L). Percent recoveries (%R) and relative percent differences (%RPD) between paired recoveries were correctly calculated and accurately reported on the Form III summaries for the spiked analytes.

All recoveries were acceptable (range 50 – 127 %R; overall laboratory-established control limits: 15 – 200 %R; Region 1 limits 60 – 140 %R) and reproducible (range: 0 - 30%; limit 30% RPD), with the following exceptions:

Table 5. Matrix Spike/Matrix Spike Duplicate Exceedances

Parent Sample	Analyte	Native Conc. (ug/L)	% R (MS)	% R (MSD)	Laboratory Limits (%R)	% RPD
WP-8	chloroethane	nd	61	63	70 - 130	a
MW-4S	chloromethane	nd	133	a	65 - 120	a
	bromomethane	nd	50	45	60 - 120	a
	carbon disulfide	nd	121	a	80-120	31
	1,1-dichloroethane	nd	127	a	80-120	a
	cis-1,2-dichloroethene	nd	126	a	80-125	31
	chloroform	nd	124	a	75-120	32
	1,1,1-trichloroethane	nd	121	a	75-120	31
	carbon tetrachloride	nd	123	a	75-120	a
	trichloroethene	nd	123	a	75-120	a
	toluene	nd	125	a	80-120	31
	tetrachloroethene	1.4	124	a	80-120	a
	o-xylene	nd	121	a	80-120	31
	vinyl chloride	nd	a	64	80-130	33
	1,1-dichloroethene	nd	a	a	80-120	31
	methylene chloride	nd	a	68	80-120	47
	4-methyl-2-pentanone	nd	a	a	80-125	31
	2-hexanone	nd	a	67	75-150	a
	dibromochloromethane	nd	a	a	80-125	31
	m&p-xylene	nd	a	a	80-125	35
	styrene	nd	a	78	80-120	a
bromoform	nd	a	a	80-120	32	
W-1	bromomethane	nd	38	37	60-120	a
	chloroethane	nd	131	a	80-130	a
	tetrachloroethene	24	44	126	80-120	a
	vinyl chloride	nd	a	64	80-130	a
	methylene chloride	nd	a	77	80-120	a
	2-hexanone	nd	a	68	75-150	a
W-SEEP	vinyl chloride	nd	72	65	80-130	a
	bromomethane	nd	41	53	60-120	a
	2-hexanone	nd	72	74	75-150	a
MW-S2	chloromethane	nd	130	a	65-120	a
	bromomethane	nd	59	54	60-120	a
	chloroethane	nd	141	a	80-130	a
	1,1-dichloroethane	nd	121	a	80-120	a
	1,1,2,2-tetrachloroethane	nd	126	a	80-125	a

Parent Sample	Analyte	Native Conc. (ug/L)	% R (MS)	% R (MSD)	Laboratory Limits (%R)	% RPD
	vinyl chloride	nd	a	66	80-130	39
	2-hexanone	nd	a	71	75-150	a

nd = not detected a = acceptable

Results exceeding both laboratory and Region I limits are shown in **boldface**.

Since tetrachloroethene was spiked at a concentration less than four times the native concentration in sample W-1, no qualifications were necessary on the basis of the unacceptable recoveries of tetrachloroethene in the associated MS and MSD analysis. No qualifications were deemed necessary for recoveries of the analytes shown outside laboratory-established limits but within Region 1 limits in the MS and/or MSD analyses of samples WP-8, MW-4S, W-1, W-SEEP, and MW-S2. Since chloroethane was not detected in sample MW-S2, it was not necessary to qualify the result for chloroethane in MW-S2 on the basis of the high recovery of chloroethane in the MS analysis.

On the basis of the unacceptably low recoveries in the associated MS and MSD analyses (range 38-59%), results for bromomethane in MW-4S, W-1, W-SEEP, and MW-S2 were qualified as estimated (UJ). On the basis of poor precision in the associated MS and MSD analyses, results for carbon disulfide, cis-1,2-dichloroethene, chloroform, 1,1,1-trichloroethane, toluene, m&p-xylene, o-xylene, total xylenes, vinyl chloride, 1,1-dichloroethene, methylene chloride, 4-methyl-2-pentanone, dibromochloromethane, and bromoform in MW-4S, and for vinyl chloride in MW-S2 were qualified as estimated (UJ).

All analytes were spiked into the MS/MSD analyses; therefore non-spiked target compounds could not be evaluated against the parent samples to evaluate laboratory precision.

IX. Field Duplicates

SDG Nos. BRES59, UNIF51, WHEA20, and UNIF52 contained five groundwater field duplicate pairs for Method 8260B and two drinking water field duplicate pairs analyzed by Method 524.2, which were identified by the field sampler as follows:

Table 6. Field Duplicate Identifications

Field Sample	Field Duplicate
Method 8260B	
MW-25884	BRW-Z
MW-C	W-Z
MW-PL1	MW-PLX
SEEP-1A	SS-Z
MW-101S	MW-Z
Method 524.2	
WP-3	WP-Z
SHIELDS	WELL-Z

Tetrachloroethene was detected at greater than twice the quantitation limit in MW-C, W-Z, MW-PL1, MW-PLX, MW-101S, and MW-Z by Method 8260B, and above the quantitation limit in SEEP-1A and at twice the quantitation limit in SS-Z; trichloroethene was detected at greater than twice the quantitation limit in MW-C and MW-Z by Method 8260B and in WP-3 and WP-Z by Method 524.2, and above the quantitation limit in SEEP-1A, SS-Z, MW-101S, and MW-Z.

Trichloroethene, tetrachloroethene, and cis-1,2-dichloroethene were detected below the quantitation limit in MW-25884 and BRW-Z; trichloroethene was detected below the quantitation limit in MW-PL1 and MW-PLX; and cis-1,2-dichloroethene was detected below the quantitation limit in MW-101S and MW-Z. Acetone, carbon disulfide, and benzene were detected below their quantitation limits in WP-3 and WP-Z, and acetone was detected below the quantitation limit in SHIELDS. No other target compounds greater than 2 times the quantitation limit were detected in these samples, so precision could not be evaluated for any other analytes in these field duplicate pairs.

Precision in the field duplicate pairs MW-25884 and BRW-Z, MW-C and W-Z, MW-PL1 and MW-PLX, SEEP-1A and SS-Z, MW-101S and MW-Z, WP-3 and WP-Z, and SHIELDS and WELL-Z was acceptable (less than 30 % RPD) for all target analytes greater than 2 times the quantitation limit.

X. Sensitivity Check

The aqueous MDL and verification studies submitted for Method 8260B were performed in December, 2013 and March and April, 2014. The Limit of Quantitation (LOQ) values are verified on a quarterly basis, and checked during on-site assessments performed by NELAP and Department of Defense assessors. All project analytes in this study had calculated MDL values below the method quantitation limits and verified, acceptable LOQ values.

The aqueous MDL and the MDL verification studies for Method 524.2 submitted for this project were completed in January, 2014, which is less than one year prior to the sample analyses in this data set. All analytes had calculated and verified MDLs below the method quantitation limits in the MDL study.

Current verification studies have not been requested for either method. All of the laboratory control samples and the MS and MSD analyses analyzed with the samples for both methods were spiked at 1 µg/L (ketones at 5 µg/L), as required by the FLCM. Recoveries within or above Region 1 acceptance criteria (60 – 140 %R) were obtained for all target analytes in all spiked analyses (except as noted). In addition, the low standard of the initial calibrations for both methods supports the reporting limit for the sample analyses.

On the basis of acceptable recoveries in low-concentration laboratory control samples, and the low standard of the initial calibrations at the reporting limit, sensitivity for both methods was deemed acceptable for the purposes of this monitoring program.

XI. Performance Evaluation (PE) Samples/Accuracy Check

Five zero blind PE samples (commonly known as laboratory control sample, LCS) and duplicate (LCSD) pairs, and three LCS and LCSD pairs were prepared and analyzed by the laboratory at 1 µg/L (ketones at 5 µg/L) in support of the Method 8260B and Method 524.2, respectively, sample analyses in this data set. Laboratory established control limits are 15 – 200 %R (overall) for Method 8260B, and 70 – 130 %R for each analyte for Method 524.2; the Region 1 control limits are 60 – 140 %R. The laboratory limit of 30 %RPD limit is shown on the Form III summaries for Method 8260B analyses, and a 20 %RPD limit is shown on the Form III summaries for the Method 524.2 paired analyses; the Region 1 limit for paired aqueous analyses is 30 %RPD.

Percent recoveries were correctly calculated and accurately reported on Form III summaries in the

data packages, and were acceptable (67 – 134 %R for Method 8260B, and 70 - 130 %R for Method 524.2) and reproducible (0 - 30 %RPD across both methods) with the following exceptions:

Table 7. LCS/LCSD Exceedances

Batch ID (date)	Analyte	LCS %R	LCSD %R	Laboratory Limits (%R)	% RPD
Method 524.2					
200-79351 (10/27/14)	trans-1,3-dichloropropene	a	a	70 - 130	23
Method 8260B					
200-79725 (10/31/14)	chloromethane	60	a	65 - 120	67
	vinyl chloride	71	77	80 - 130	a
	1,1-dichloroethane	123	a	80-120	a
	trichloroethene	123	a	75-120	a
	toluene	122	a	80-120	a
	chlorobenzene	121	a	80-120	a
	1,1,2,2-tetrachloroethane	132	a	80-125	a
200-79733 (11/1/14)	chloromethane	139	a	65 - 120	a
	chloroethane	137	a	80-130	a
	carbon disulfide	124	a	80-120	a
	1,1-dichloroethane	126	a	80-120	a
	cis-1,2-dichloroethene	126	a	80-125	a
	chloroform	121	a	75-120	a
	carbon tetrachloride	121	a	75-120	a
	1,2-dichloroethane	123	a	70-120	a
	trichloroethene	123	a	75-120	a
	bromodichloromethane	121	a	80-120	a
	toluene	121	a	80-120	a
	trans-1,3-dichloropropene	124	a	80-120	a
	vinyl chloride	a	73	80-130	31
	200-79759 (11/2/14)	vinyl chloride	74	a	80-130
bromomethane		53	54	60 - 120	a
chloromethane		a	125	65-120	a
chloroethane		a	131	80-130	a
200-79760 (11/3/13)	chloromethane	139	a	65 - 120	a
	chloroethane	142	a	80-130	a
	carbon disulfide	121	a	80-120	a
	1,1-dichloroethane	122	a	80-120	a
	1,2-dichloroethane	123	a	70-120	a
	trichloroethene	122	a	75-120	a
	trans-1,3-dichloropropene	122	a	80-120	a
	bromomethane	a	52	60-120	a
methylene chloride	a	a	80-120	31	
200-81469 (12/1/14) [continued on next page]	bromomethane	165	150	60 - 120	a
	chloroethane	132	a	80 - 130	a
	1,1-dichloroethene	124	a	80-120	32
	carbon disulfide	127	a	80-120	a
	trans-1,2-dichloroethene	134	a	80-125	36
	1,1-dichloroethane	139	a	80-120	34

Batch ID (date)	Analyte	LCS %R	LCSD %R	Laboratory Limits (%R)	% RPD
200-81469 (12/1/14) [continued]	cis-1,2-dichloroethene	137	a	80-125	41
	chloroform	134	a	75-120	34
	1,1,1-trichloroethane	125	a	75-120	32
	carbon tetrachloride	124	a	75-120	31
	benzene	130	a	80-125	a
	1,2-dichloroethane	134	a	70-120	35
	trichloroethene	135	a	75-120	37
	1,2-dichloropropane	134	a	80-125	33
	bromodichloromethane	132	a	80-120	37
	cis-1,3-dichloropropene	126	a	80-125	34
	toluene	127	a	80-120	31
	trans-1,3-dichloropropene	131	a	80-120	42
	1,1,2-trichloroethane	139	a	80-125	34
	tetrachloroethene	123	a	80-120	a
	dibromochloromethane	126	a	80-125	33
	chlorobenzene	130	a	80-120	32
	ethylbenzene	126	a	80-125	31
	o-xylene	129	a	80-120	32
	bromoform	130	a	80-120	36
	1,1,2,2-tetrachloroethane	144	a	80-125	35
	vinyl chloride	a	76	80-130	a
	acetone	a	a	15-200	41
methylene chloride	a	42	80-120	63	
2-hexanone	a	a	75-150	33	

a = acceptable

Results exceeding both laboratory and Region I limits are shown in **boldface**.

No reanalysis was performed for the recoveries above the upper acceptance limits in any of the LCS/LCSD pairs. For Method 8260B, since the reported recoveries were within Region 1 limits, no results were qualified for the recoveries slightly above laboratory control limits in the LCS or LCSD analysis on 10/31/14, 11/1/14, 11/2/14, 11/3/14, and 12/1/14, or for the recoveries slightly below the lower laboratory control limit for vinyl chloride in the LCS and LCSD analyses on 10/31/14, 11/1/14, 11/2/14, and 12/1/14.

Since bromomethane and chloroethane were not detected in associated samples, no results required qualification on the basis of recoveries above both laboratory and Region 1 limits in the associated LCS and LCSD analyses on 11/3/14 (chloroethane) and on 12/1/14 (bromomethane) for Method 8260B.

Bromomethane recoveries were below both laboratory established control limits and Region 1 limits for the LCS and LCSD samples analyzed on 11/2/14, and for the LCSD sample analyzed on 11/3/14 for Method 8260B. Non-detected results for bromomethane in samples W-19, PZ-101, PZ-102, W-25, SS-2, SS-5, W-SEEP, SEEP-1A, SP-MW3, SS-Z, TB-4, FB-5, MW-PL2, MW-S1, MW-S2, MW-PL1, and MW-PLX were qualified as estimated (UJ) on the basis of the unacceptably low recoveries in the associated LCS and LCSD analyses. Methylene chloride recovery was below both laboratory established control limits and Region 1 limits for the LCSD sample analyzed on 12/1/14 for Method 8260B. Non-detected results for methylene chloride in samples TRIP BLANK and SP-4 were qualified as estimated (UJ) on the basis of the unacceptably low recoveries in the associated LCSD analysis.

On the basis of the unacceptable precision in the associated LCS and LCSD sample analyses on 10/31/14, results for chloromethane in TB-2, MW-103RD, MW-104S, MW-104D, MW-102D, MW-102S, MW-101S, MW-Z, MW-4S, MW-4D, MW-3S, MW-3D, TB-1, and FB-2 were qualified as estimated (UJ).

On the basis of unacceptable precision in the associated LCS and LCSD sample analysis on 11/1/14, results for vinyl chloride in BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, and TB-3 were qualified as estimated (UJ). On the basis of the unacceptable precision in the associated LCS and LCSD sample analyses on 11/3/14, the result for methylene chloride in MW-PLX was qualified as estimated (UJ).

On the basis of unacceptable precision for most of the analytes in the associated LCS and LCSD sample analyses on 12/1/14, results for all analytes in TRIP BLANK and SP-4 were qualified as estimated (J, UJ). Since the relative percent differences were below the Region 1 limit of 30 %RPD, no results were qualified for the reported precision above the laboratory acceptance limit (20 %RPD) for trans-1,3-dichloropropene in the LCS and LCSD pair analyzed by Method 524.2 on 10/27/14.

One external single-blind PES sample for Method 524.2 was submitted with the samples in this sampling round.

The results of the PES are summarized in Appendix C. All spiked compounds were within the vendor's published QC Performance Acceptance Limits (three standard deviations). One target analyte not added by the vendor, acetone, was reported in the analysis of the PES, at a concentration below the quantitation limit (1.2 ug/L). The method blank, as well as trip blank, field blank and holding blank that were analyzed in this analytical window all had positive detections for acetone below reporting limit. The validator believes the presence of acetone in all these blanks as well as the false positive in the PES is due to wide spread laboratory contamination, and not indicative of contamination being introduced in the shipping cooler, field sampling, or holding refrigerator.

XII. Target Compound Identification

Reported target compounds were correctly identified with supporting spectra present for all samples in these data packages.

XIII. Compound Quantitation and Reported Quantitation Limits

Target compound quantitation and practical quantitation limits (PQLs) were accurately reported on the Form I summaries. Based on screen results, dilution analysis (2-fold) was performed for sample MW-D to bring the result for tetrachloroethene within the upper half of the calibration range for Method 8260B. Based on the reported result, the 2-fold dilution performed on MW-D was necessary, and no full-strength analysis was performed.

One or more manual integrations were performed on field samples and spiked analyses. The manual integrations appear to be correctly performed, are initialed by the analyst, and are accurately reported with the final area listed on the tabular report and the before and after ion chromatograms included in the data packages.

The laboratory appropriately applied "J" qualifiers to the sample Form I's when the concentration of an analyte was less than the sample-specific PQL. The validator did not remove these qualifiers.

The values that the validator has judged to be acceptable are presented in the “Validated_Value” column in the Data Summary Table in Attachment A and in the spreadsheet summary files submitted electronically as Attachment B. The final qualifiers based on the validation effort are presented in the “Validator_Qualifier” column in the Data Summary Table and in the spreadsheet summary files. All results, positive and non-detect, are listed in these summaries, whether or not the value or qualifier was changed as a result of the validation; if a value or qualifier was changed, this is indicated by the “Y” (for yes) notation in the column “Validator_Change” in the Data Summary Table. Sample-specific (practical) quantitation limits (PQL) are given in the summaries.

All laboratory-specific qualifiers, such as the asterisk (*), have been removed by the validator. This is not noted as a validation change.

XIV. Tentatively Identified Compounds (TICs)

Evaluation of unidentified, non-target analyte peaks was not requested or performed for these samples.

XV. System Performance

The analytical systems appear to have been operating well at the time of these analyses based on the evaluation of the available raw data, with the exceptions noted within this report.

XVI. Overall Evaluation of Data

Results for volatile organic compounds were determined to be valid as reported for all samples in SDG Nos. BRES59, UNIF51, WHEA20, and UNIF52, with the following exceptions:

- On the basis of post-analysis pH measurement of sample MW-103RD being recorded as pH 7, results for all non-detected aromatic compounds in MW-103RD were rejected (R).
- On the basis of the unacceptably high percent difference results in the associated ICV, results for chloromethane in SP-4 and TRIP BLANK were qualified as estimated (UJ).
- On the basis of the unacceptable %D value in the associated CC standards, results for acetone in samples TB-2, MW-103RD, MW-104S, MW-104D, MW102D, MW-102S, MW-101S, MW-Z, MW-4S, MW-4D, MW-3S, MW-3D, TB-1, FB-2, BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, and TB-3 analyzed by Method 8260B, and for bromomethane in BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, TB-3, W-19, PZ-101, PZ-102, W-25, SS-2, SS-5, W-SEEP, SEEP-1A, SP-MW3, SS-Z, TB-4, FB-5, MW-PL2, MW-S1, MW-S2, MW-PL1, and MW-PLX analyzed by Method 8260B were qualified as estimated (UJ).
- On the basis of suspected laboratory contamination exhibited in method and storage blanks, results for acetone in TB-5, FB-1, SHIELDS, FB-6, WP-7, WP-8, WP-3, and WP-Z, and for methylene chloride in FB-1, FB-6, and WP-7 were qualified as less than the quantitation limit (U).

- On the basis of unacceptably low recoveries in the associated MS and MSD analyses, results for bromomethane in MW-4S, W-1, W-SEEP, and MW-S2 were qualified as estimated (UJ). On the basis of poor precision in the associated MS and MSD analyses, results for carbon disulfide, cis-1,2-dichloroethene, chloroform, 1,1,1-trichloroethane, toluene, m&p-xylene, o-xylene, total xylenes, vinyl chloride, 1,1-dichloroethene, methylene chloride, 4-methyl-2-pentanone, dibromochloromethane, and bromoform in MW-4S, and for vinyl chloride in MW-S2 were qualified as estimated (UJ).
- Non-detected results for bromomethane in samples W-19, PZ-101, PZ-102, W-25, SS-2, SS-5, W-SEEP, SEEP-1A, SP-MW3, SS-Z, TB-4, FB-5, MW-PL2, MW-S1, MW-S2, MW-PL1, and MW-PLX, and non-detected results for methylene chloride in samples TRIP BLANK, and SP-4 were qualified as estimated (UJ) on the basis of the unacceptably low recoveries in the associated LCS and LCSD analyses.
- On the basis of the unacceptable precision in the associated LCS and LCSD sample analyses, results for chloromethane in TB-2, MW-103RD, MW-104S, MW-104D, MW-102D, MW-102S, MW-101S, MW-Z, MW-4S, MW-4D, MW-3S, MW-3D, TB-1, and FB-2, for vinyl chloride in BRW-3, BRW-2, BRW-1, MW-25884, BRW-Z, MW-50, MW-C, W-Z, MW-E, W-1, W-20, MW-D, FB-4, and TB-3, and the result for methylene chloride in MW-PLX were qualified as estimated (UJ), and results for all analytes in TRIP BLANK and SP-4 were qualified as estimated (J,UJ).
- Although acetone was reported below the quantitation limit as a false positive in the PES, acetone was also positively detected in the method blank, trip blank, field blank and holding blank analyzed in the same analytical window, so no qualifications were applied on the basis of the false positive in the PES analysis.
- The laboratory appropriately applied “J” qualifiers to the sample Form I’s when the concentration of an analyte was less than the sample-specific PQL. The validator did not remove these qualifiers.
- All laboratory-specific qualifiers, such as the asterisk (*), have been removed by the validator.

Documentation problems observed in the data packages are described in Section XVII.

XVII. Documentation

Chain-of-custody (COC) and internal chain of custody (ICOC) records were present and completed accurately. However, it was noted that the required trip blank for Method 524.2 analysis was not submitted with samples collected on 10/20/14. Instead, two trip blanks for Method 8260B analysis were submitted for samples collected and transported on this date.

Data presentation was acceptable, with the following exceptions:

- The sample MW-103RD was incorrectly identified on the field sheets and the Chain of Custody and logged into the laboratory as MW-103D. This monitoring well was originally identified as MW-103D but was re-drilled, and the “R” was added to the sample ID. The

validator has used the correct sample identifier (MW-103RD) throughout this report and in the associated spreadsheet files.

This validation report should be considered part of the data packages for all future distributions of the volatiles (8260B and 524.2) analysis data.