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# Shelburne Road Variety 1855 Shelburne Road South Burlington, Vermont

SMS Site #2010-4047  
KAS Job #410090357

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## SPRING/SUMMER 2016 GROUNDWATER MONITORING AND REMEDIAL SYSTEM OPERATION & MAINTENANCE REPORT

September 14, 2016

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*Prepared for:*

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## 1.0 Introduction and Background

This report summarizes the March 2016 and July 2016 groundwater monitoring events conducted at the Shelburne Road Variety property located at 1855 Shelburne Road in South Burlington, Vermont, ("Site"). This report also includes a summary of the soil vapor extraction (SVE) and air sparge (AS) system operation and maintenance (O&M) visits performed between November 10, 2015 and June 23, 2016. A Site location Map is included as Appendix A. KAS, Inc. (KAS) conducted this work for the Champlain Oil Company (COCO), the owner of the Site. Previous reports documenting site history, investigative work, groundwater monitoring and remedial activities are on file at the Vermont Department of Environmental Conservation (VTDEC) in Montpelier, Vermont.

Petroleum contamination was first encountered at the Site during underground storage tank (UST) removal activities conducted in October 2009 and April 2010. Subsequent monitoring of groundwater beneath and in the vicinity of the Site indicated dissolved phase petroleum-related constituents in excess of applicable Vermont Groundwater Enforcement Standards (VGES). Additionally, light non-aqueous phase liquid (LNAPL) has been detected in select wells and impacts to nearby surface water and low lying wet areas has been documented. Since June 2015, KAS has operated a SVE/AS remediation system at the Site. To date, the SVE/AS system has removed approximately 290 gallons of product (weathered gasoline) from the subsurface. The system was briefly shut down between March 4, 2016 and May 6, 2016 due to poor recovery rates and to evaluate recharge after a period of the system being off. The system was shut down again on June 23, 2016 due to poor recovery rates and remains off as of the date of the report.

The current scope of work at the Site includes biweekly monitoring of the SVE/AS system when the system is in operation, quarterly groundwater monitoring of key site-related monitoring wells (MW10-2 thru MW10-6, MW12-14, MW13-17 and MW13-18), semi-annual groundwater monitoring of perimeter wells (MW10-1, MW11-8 thru MW11-10, MW12-13 and MW12-15), and a visual inspection of sensitive receptors (low wet area and drainage area) during each monitoring event. A data deliverable package for the results of the most recent quarterly monitoring event conducted in March 2016 was submitted to the VTDEC on April 21, 2016. Results of the semi-annual monitoring event conducted in July 2016 are detailed in this report; however, a discussion and analysis of the March 2016 sampling event is also included. A data deliverable package for the SVE/AS system O&M visits conducted from November 10, 2015 thru February 16, 2016 was submitted on February 18, 2016 ahead of this formal O&M report per VTDEC request. In general, KAS has provided biweekly updates of the systems performance to the VTDEC via email correspondence to allow input on system operation. This report provides a summary of the systems performance from November 2015 thru June 2016.

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## 2.0 Remedial System Status Summary

A total of sixteen SVE/AS system O&M site visits were conducted biweekly (every other week) while the system was in operation from November 10, 2015 to June 23, 2016 (reporting period) and are summarized in this report. Tabular and graphic summaries of system monitoring data and hydrocarbon recovery calculations are included in Appendix B.

### 2.1 General System Operation and Maintenance

Basic system O&M tasks include measuring/recording the following: influent pressure, influent/effluent vapor concentrations, Falco 300 Catalytic Oxidizer (CatOx) temperatures, CatOx hour meter, vapor control valve (VCV) status, water knockout status, SVE blower vacuums, vapor concentrations/vacuums at each vent point, AS compressor temperature/pressure, and flow/pressure at each sparge point.



Pressure, temperature, and hour system readings were collected by reading system gauges. VCV status was obtained by measuring the pin that indicates the amount of dilution air being introduced into the system. The water knockout was checked periodically when the system was shut down by opening the drain valve which allows water, if present, to be released. Vacuum readings were collected by reading system gauges and using magnehelic gauges. Vapor concentrations were measured with a photoionization detector (PID) equipped with a minimum 10.6 eV bulb. An air pump was used to draw vapor on the vacuum side of the system for measurement with a PID. During each O&M site visit, all measurements/readings were taken upon arrival. If the system was shut down for adjustments, secondary measurements/readings were taken approximately one hour after SVE/AS system restart. The above mentioned tasks were completed during each O&M site visit conducted during the reporting period.

## 2.2 SVE/AS System Monitoring

Data collected during the reporting period indicates the SVE/AS system attained a low rate of vapor removal as compared to the initial reporting period. Vapor concentrations from the influent air stream, as determined by the CatOx temperatures and/or using a PID, have shown that overall, vapor concentrations have significantly declined since a maximum of 1,600 parts per million (ppm) was recorded on July 17, 2015. At the end of the previous reporting period (October 29, 2015) influent concentrations were measured at 72.0 ppm. During this reporting period, influent concentrations averaged 22 ppm (maximum of 76.7 ppm) and a concentration of 1.7 ppm was recorded during the most recent site visit conducted on June 23, 2016. Influent air flow rates as calculated by a pressure gauge pre-CatOx have steadily decreased from a high of 223 standard cubic feet per minute (scfm) to a current rate of 122 scfm. Conversely, vacuum readings pre-SVE blower steadily increased until an adjustment was made to the variable frequency drive (VFD) which controls the blower on February 4, 2016. The increased vacuum and reduced flow rates were likely the result of tight soil conditions (decreased porosity due to frost) during winter months. Vacuums were lowered due to the potential for localized groundwater mounding and to prevent unnecessary energy usage.

Vapor wells SVE-1A (shallow) and SVE-1B (deep) exhibited the highest PID readings during this reporting period with maximum vapor concentrations of 579.4 ppm and 194 ppm, respectively. Concentrations in both vapor wells have since declined to below 0.3 ppm based on the most recent PID readings obtained on June 23, 2016. Adjustments were made periodically to the vapor wells (closing poor performing wells) in an effort to increase influent concentrations. On several occasions, water was observed in shallow and deep vent wells when drawing on them with an air pump. No water was observed in the vapor wells after the system vacuum was lowered as discussed above. This indicates that some amount of the localized mounding was likely occurring at higher vacuums. A slight increase in vapor concentrations was observed at select locations with these adjustments.

Since system startup, select AS points have not operated at optimal flows (>4cfm) which limits the amount of successful air sparging occurring. These points include AS-1 and AS-3 which are located on northwestern portion of the property and downgradient of the source area. While AS-1 has periodically produced flows close to 4 cfm, AS-3 has not operated above 2 cfm. For this reporting period, AS-1 thru AS-4 have operated at less than optimal flow rates despite system adjustments. The three AS points located near the source area (AS-5 thru AS-7) have operated successfully during this reporting period. Several adjustments to the flow rates have been made in an effort to increase vapor concentrations. Limited evidence of a correlation between vapor concentrations and adjustments performed during this reporting period has been identified. Tight soil conditions (decreased porosity due to frost) over the winter months likely contributed to the poor AS flow rates.

## 2.3 Hydrocarbon Recovery Volumes and Rates

The hydrocarbon recovery during the reporting period is estimated to be approximately 8 gallons of equivalent weathered gasoline and since system startup in June 2015 the recovery is estimated at



approximately 290 gallons of equivalent weathered gasoline. Hydrocarbon recovery was estimated based on methodology provided by the manufacturer of CatOx installed at the Site.

Several adjustments have been made in an effort to increase efficiency of the system and recovery rates. These include: increasing/decreasing AS flow rates, reducing overall system vacuums, closing poor performing SVE wells, and system shutdowns. Of these adjustments, the system shutdown which occurred between March 4, 2016 and May 6, 2016 resulted in the largest increase in system efficiency and recovery rates. Prior to system shutdown, the influent concentration was 9.8 parts per million (ppm) and the recovery rate was 0.1 pound per day. After system restart, the influent concentration and recovery rate increased to 76.7 ppm and 0.9 pounds per day, respectively. Low Influent concentrations and recovery rates were observed again after 48 days of operation. Based on the influent vapor concentrations observed over this reporting period it appears treatment with a CatOx may no longer be warranted and a cost evaluation for treatment via carbon should be performed. The need for periodic system shutdowns to increase system efficiency should also be evaluated.

A summary of the SVE/AS system performance to date is included in Appendix B.

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## **3.0 Groundwater Monitoring**

### *3.1 Determination of Groundwater Flow Direction and Gradient*

Water level measurements were collected from select site-related monitoring wells in March and July 2016 using a Keck™ interface probe (IP). Measurements were collected while the SVE/AS system was temporarily shut down.

On March 30, 2016, depth to water in eight on-site wells ranged from 14.42 to 21.49 feet below top of casing (btoc). One off-site well (MW12-14) was also gauged during this quarterly monitoring event and depth to water was recorded at 4.54 feet btoc. No LNAPL was detected in any of the wells gauged. These measurements are within range of previous levels observed during the spring season.

On July 8, 2016, depth to water in eight on-site wells ranged from 12.23 to 22.28 feet btoc. Depth to water measured in three off-site wells ranged from 5.81 to 8.95 feet btoc. No LNAPL was detected in any of the wells gauged. The water level measurements obtained during this semi-annual event are within range of previous levels observed during the summer season.

For each gauging event, the water level measurements were subtracted from the top of casing to determine the water table elevation at each of the wells. Groundwater level data are recorded in Appendix C. Groundwater elevation data for the July event was used to generate a Groundwater Contour Map which is included in Appendix A. The groundwater flow direction for the July 8, 2016 gauging event was generally oriented to the northwest at a hydraulic gradient of 6.9%. The groundwater contour map for the March 2016 monitoring event is also included in Appendix A and flow/gradients are generally consistent with the July 8, 2016 data.

### *3.2 Groundwater Sample Collection and Analysis*

Quarterly sampling of eight key site-related monitoring wells (MW10-2 thru MW10-6, MW12-14, MW13-17 and MW13-18) was conducted on March 30, 2016. Surface water sampling was not necessary for the quarterly sampling event as no visible sheens were observed.

A semi-annual groundwater sampling event was conducted on July 8, 2016. Groundwater samples were collected from seven key site-related monitoring wells (MW10-2 thru MW10-6, MW13-17 and MW13-18) and from four perimeter wells (MW10-1, MW11-9, MW12-13 and MW12-15). A sample could



not be collected from key site well MW12-14 as this well was not located due to thick brush and an overgrowth of thorn bushes. Perimeter well MW11-8 could not be sampled due to a seized standpipe bolt. Additionally, a sample could not be collected from perimeter well MW11-10 due the absence of water in the well column. Surface water sampling was not necessary for the semi-annual sampling event as no visible sheens were observed.

Samples collected during both events were chilled and delivered under proper chain-of-custody procedures to Endyne, Inc. of Williston, Vermont. One trip blank and one duplicate sample were collected for quality assurance / quality control (QA/QC) analyses for each sampling event. All samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8021B. A tabulation and graphic presentation of current and historical analytical data is provided in Appendix D and compared with the applicable VGES and Vermont Water Quality Standards (VWQS). The laboratory reports and chain-of-custody forms are presented in Appendix E.

### Analytical Results

Results of the March 2016 quarterly sampling event indicated contaminant concentrations in excess of VGES in seven of the eight wells sampled: MW10-2, MW10-3, MW10-5, MW10-6, MW12-14, MW13-17 and MW13-18. One compound, benzene, was reported in the sample collected from MW10-4 but the concentration was below VGES. Total reported VOC concentrations ranged from 1.1 ug/L to 40,413 ug/L (MW13-18).

Results of the July 2016 semi-annual sampling event indicated contaminant concentrations in excess of VGES in nine of the eleven wells sampled: MW10-2, MW10-3, MW10-5, MW10-6, MW11-9, MW12-13, MW12-15, MW13-17 and MW13-18. Select VOCs were reported in the samples collected from MW10-1 and MW10-4 but all concentrations were below VGES. Total reported VOC concentrations ranged from 4.2 ug/L to 27,766 ug/L (MW10-6).

### Trend Analysis

For the March 2016 monitoring event, total VOC concentrations at MW12-14, MW13-17 and MW13-18 showed moderate to significant increases since the previous sampling event in January 2016; however all concentrations remain below average pre-system levels. An increase was also noted at MW10-3 since the previous sampling event for this well (October 2015); however the current concentration remains well below average pre-system levels. This is the first sampling event for MW10-6 since remedial system startup (June 2015). LNAPL was present in this well for four consecutive monitoring/gauging events after system startup but has since dissipated. Current dissolved phase concentrations in this well are indicative of the recent presence of LNAPL. While concentrations in MW10-6 are above average pre-system levels, it is worthy to note that similar levels were noted in this well in April 2011. Total VOC concentrations in the remaining wells sampled in March 2016 showed a decrease since previous sampling.

For the July 2016 monitoring event, a decrease in total VOC concentrations was observed at most well locations since the previous respective sampling and all concentrations, except MW10-6, remain lower than average pre-system levels. Increases were noted at MW10-2, MW10-4 and MW12-15; however, current concentrations at MW10-2 remain below VGES and concentrations at MW10-4 and MW12-15 are within range of historic fluctuations. Of note, concentrations reported at MW11-9 are presently the lowest reported to date.

Current and historical data indicates dissolved phase contaminant concentrations continue to fluctuate over time at select well locations; however, an overall long-term declining concentration trend has been observed at most well locations since monitoring began. Based on the current data, it appears the SVE/AS system, which began operation in June 2015, has been effective in reducing contaminant concentrations beneath the Site. To date, the SVE/AS system has removed approximately 290 gallons



of product (as weathered gasoline) from the subsurface. Percent decreases in wells to date since SVE/AS system operation are listed below. Because seasonal fluctuations in contaminant concentrations are observed at most well locations, an average pre-startup concentration was used to determine the percent decline to date. Percent declines for select wells are not listed due to a lack of post-startup analytical data.

MW10-1: 88.4% (95.9 to 11.1 ppb)  
MW10-2: 94.0% (103,724 to 6,244 ppb)  
MW10-3: 94.7% (57,021 to 3,014 ppb)  
MW10-4: 98.3% (242 to 4.2 ppb)  
MW10-5: 99.6% (85,981 to 365.1 ppb)  
MW10-6: (179%) (9,937 to 27,766 ppb)  
MW11-8: (84.9%) (837 to 1,548 ppb)  
MW11-9: 75.7% (17,725 to 4,297 ppb)  
MW11-10: 98.1% (195 to 3.7 ppb)  
MW12-13: 66.4% (8,918 to 2,992 ppb)  
MW12-14: 19.3% (35,449 to 28,597 ppb)  
MW12-15: 22.5% (9,465 to 7,328 ppb)  
MW13-17: 20.4% (31,689 to 25,213 ppb)  
MW13-18: 96.2% (49,680 to 1,881 ppb)  
MW13-19: 18.9% (8,958 to 7,263 ppb)

As noted above, concentrations at wells MW10-6 and MW11-8 are above average pre-startup concentrations; however, similar levels have historically been reported at both locations.

LNAPL previously observed in monitoring wells MW10-2 and MW10-3 appears to have dissipated since system startup and dissolved phase concentrations at these locations are presently the second lowest to date. Groundwater levels in the vicinity of these wells have returned to similar levels when LNAPL was observed therefore the lack of observable LNAPL is not believed to be influenced by depressed groundwater levels but rather successful remediation via operation of the SVE/AS system. Depressed water table conditions in the vicinity of MW10-6 after system startup resulted in the appearance of LNAPL in this well. LNAPL in this well appears to have since dissipated based on the lack of observable LNAPL in March and July 2016. However, groundwater levels have increased at this location therefore it is unclear if LNAPL will reappear under future depressed conditions.

#### Contaminant Distribution

The highest levels of on-Site dissolved phase contaminants in March 2016 were reported in MW10-6, MW13-17 and MW13-18. Two of these wells, MW10-6 and MW13-17, also reported the highest on-Site contaminant levels in July 2016. These wells are located adjacent to or directly downgradient of the source area (former gasoline and diesel USTs) and have historically contained some of the highest concentrations noted on-Site. Reported concentrations of total targeted VOCs were plotted on the Site Map to create the Contaminant Distribution Maps (March 2016 and July 2016) in Appendix A. Based on these maps, the core of the dissolved phase plume is located on the northwestern portion of the property adjacent to and directly downgradient of the source area. The July 2016 map shows a clear break in the contaminant plumes located off-Site and on-Site. This indicates active remediation efforts occurring at the Site have successfully mitigated off-Site migration of the contaminant plume. Current and historical data indicates the dissolved phase plume has been mostly defined to the west, north and east where low to non-detectable concentrations have been reported in MW11-7, MW11-10, MW11-11, MW12-12, MW12-16 and upgradient well MW10-1. The plume likely terminates to the west shortly beyond MW11-10 and MW11-11 due to the significant reduction in VOCs from the source area to these well locations. The full extent of the plume to northwest (downgradient) has not been adequately defined. Under system operation a depression area in the vicinity of MW10-2 may cause migration of the plume to the southwest. System adjustments were made in an attempt to limit water table



depression in this area; therefore, the need for additional delineation to the southwest is not warranted at this time.

#### Quality Assurance and Quality Control

No VOCs were detected in the trip blank samples prepared on March 30, 2016 or July 8, 2016. Relative percent difference (RPD) is defined as one hundred times the difference between the actual sample and the duplicate sample, divided by the mean of the two samples. RPD values are used to determine if adequate quality assurance and control (QA/QC) were maintained during sample collection and analysis. For the March 2016 sampling event, the duplicate sample was collected from monitoring well MW10-6. RPD ranged from 0.3% to 5.3% for the detected compounds. The RPD for the total VOCs was 2.9% indicating excellent precision. For the July 2016 sampling event, the duplicate sample was collected from monitoring well MW13-7. RPD ranged from 0.0% to 10.6% for the detected compounds. The RPD for the total VOCs was 4.3% indicating excellent precision. A tabular presentation of duplicate sample data and RPD results is included in Appendix D.

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## **4.0 Sensitive Receptor Risk Assessment**

A sensitive receptor risk assessment of the area surrounding the Site is provided below, and a determination of the potential risk to identified receptors has been made based on proximity to the contaminant plume, groundwater flow direction, contaminant mobility and volatility, and contaminant concentration levels in subsurface soils and groundwater. Two sensitive receptors (low wet area and drainage swale surface water) other than soil and groundwater have been identified as being impacted from the subsurface petroleum contamination originating from the Site.

The Site is serviced by the public water system. No supply wells have been identified in close proximity to the Site as being at risk to subsurface petroleum contamination.

A low wet area is present in the immediate vicinity of the Site to the west/northwest where monitoring wells MW11-7 thru MW11-11 were installed. Petroleum sheens have previously been noted on the surface water in this area in addition to gasoline odors. Analytical testing of surface water in 2010 indicated petroleum constituents in excess of VWQS. A visual inspection of this area was performed during the March 2016 and July 2016 monitoring events; no surface water/groundwater seeps were observed during either event.

A drainage swale is located approximately 200 feet northwest of the Site. Petroleum sheens and odors have previously been observed in this area. Previous analytical testing of this area detected petroleum constituents in excess of VQWS. In October 2015, KAS collected a sample from the swale due to the observance of a visible sheen. Analytical testing indicated the sheen was likely biological nature however results confirmed that surface water continues to be impacted with petroleum constituents. A visual inspection of the area was performed during the March 2016 and July 2016 sampling events. No odors or sheens were observed. Previous analytical testing at upstream locations has confirmed that impacts to the surface water also originate from the adjacent Burlington Mitsubishi property (SMS# 99-2633).

The nearest major surface water is Lake Champlain, located approximately 1,500 west of the source area. This surface water is not believed to be at risk from the subsurface petroleum contamination originating from the Site due the significant distance from the source area.

The closest buried utilities are municipal water and sewer lines located to the east (upgradient) of the source area. At this time the utility corridors are not considered to be at risk of acting as conduits for plume migration based on the depth of groundwater and distance/direction in relation to the source area.





One main structure is present on the property, the convenience store building. The building is built on slab and was screened for VOCs with a photoionization detector (PID) during the UST closure assessment; no VOCs were measured above background conditions. Given its construction, the immediate and future risk for a vapor intrusion is considered to be low. The nearest off-Site building is located approximately 125 feet south of the Site and is not considered to be at risk for vapor intrusion based on distance/direction of the source area. The closest buildings downgradient of the Site are located approximately 250 feet northwest. These buildings are storage units built on concrete slabs. Given their purpose these buildings are presumed to not be occupied by humans for an extended period of time. Additional data is needed downgradient to determine if these buildings are at risk to vapor intrusion. There are no buildings located in the immediate vicinity of the site to the west or east. No residential buildings are present in the immediate vicinity of the Site.

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## 5.0 Conclusions

Based on the results of the March /July 2016 groundwater monitoring events and the most recent SVE/AS O&M reporting period, the following conclusions are offered:

- SVE/AS system O&M site visits were conducted on a biweekly basis while the system was in operation from November 10, 2015 thru June 23, 2016. The hydrocarbon recovery during the reporting period is estimated to be 8 gallons of equivalent weathered gasoline and since system startup in June 2015 the recovery is estimated to be 290 gallons of equivalent weathered gasoline;
- The SVE/AS system was briefly shutdown between March 4, 2016 and May 6, 2016 due to poor recovery rates and to evaluate recharge after a period of the system being off. An increase in influent concentrations and recovery rates was observed after system restart. After 48 days of operation, the system was shut down on June 23, 2016 due to poor recovery rates and remains off as of the date of this report;
- Based on current system influent concentrations, it appears treatment with a CatOx may no longer be warranted and change out to carbon treatment should be considered as well as the need for brief system shutdowns to increase efficiency;
- Depth to liquid measurements were within range of historic levels observed during spring and summer seasons;
- Groundwater flow beneath the Site is generally to the northwest at an approximate hydraulic gradient of 6.9%, which is generally consistent with historical results;
- Depressed water table conditions in the vicinity of MW10-6 after system startup in June 2015 resulted in the appearance of LNAPL in this well. LNAPL in this well appears to have since dissipated based on the lack of observable LNAPL in March and July 2016. However, groundwater levels have increased at this location therefore it is unclear if LNAPL will reappear under future depressed conditions;
- LNAPL previously observed in MW10-2 and MW10-3 appears to have dissipated due to successful remediation efforts in this area;
- Select dissolved phase petroleum-related VOCs were reported above VGES in seven of the eight wells sampled in March 2016. Total reported VOC concentrations ranged from 1.1 to 40,413 ug/L. A moderate to significant increase in contaminant levels was observed in three wells; however all concentrations remain below average pre-system levels. This was the first sampling round for MW10-6 since remediation system startup. Concentrations in this well are above average pre-system levels and indicative of the recent presence of LNAPL;



- Semi-annual sampling of site-related wells in July 2016 indicated dissolved phase petroleum-related VOCs in excess of VGES in nine of the eleven wells sampled. Total reported VOC concentrations ranged from 4.2 to 27,766 ug/L. Most well locations showed a decrease in contaminant concentrations since previous respective sampling. The three wells that had slight increases either remain below VGES or well below historic peaks;
  - Dissolved phase contaminant concentrations continue to fluctuate over time at select well locations; however, an overall long-term declining concentration has been observed at most well locations;
  - It appears the SVE/AS system, which began operation in June 2015, has been effective in reducing contaminant concentrations in the vicinity of the Site. Contaminant concentrations in on-Site wells, except MW10-6, have declined by 18.9% to 99.6% when compared to average pre-system concentrations. Concentrations in off-Site wells have declined by at least 19.3% except at MW11-8. While a percent increase is noted at MW10-6 and MW11-8 when compared to an average pre-system startup concentrations, the present concentrations are within range of levels previously observed;
  - The full downgradient extent of the dissolved phase plume has not been fully defined at this time and appears to extend at least 200 feet in a northwesterly direction towards an off-Site drainage swale. However, the July 2016 Contaminant Distribution Map shows a clear break in the contaminant plumes located off-Site and on-Site. This indicates active remediation efforts occurring at the Site have successfully mitigated off-Site migration of the contaminant plume. The contaminant plume has been mostly defined to the west, north and east. Under system operation a depression area in the vicinity of MW10-2 may cause migration of the plume to the southwest. System adjustments have been made in an attempt to limit water table depression in this area; therefore, the need for additional delineation to the southwest is not warranted at this time; and,
  - Two sensitive receptors (low wet area and drainage swale surface water), other than soil and groundwater, have been identified as being at potential risk of impact from subsurface petroleum contamination during recent or past site investigations.
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## 6.0 Recommendations

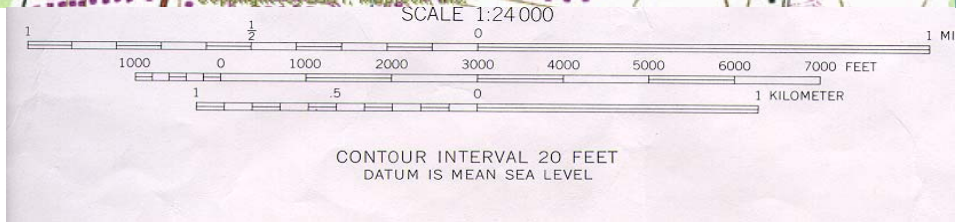
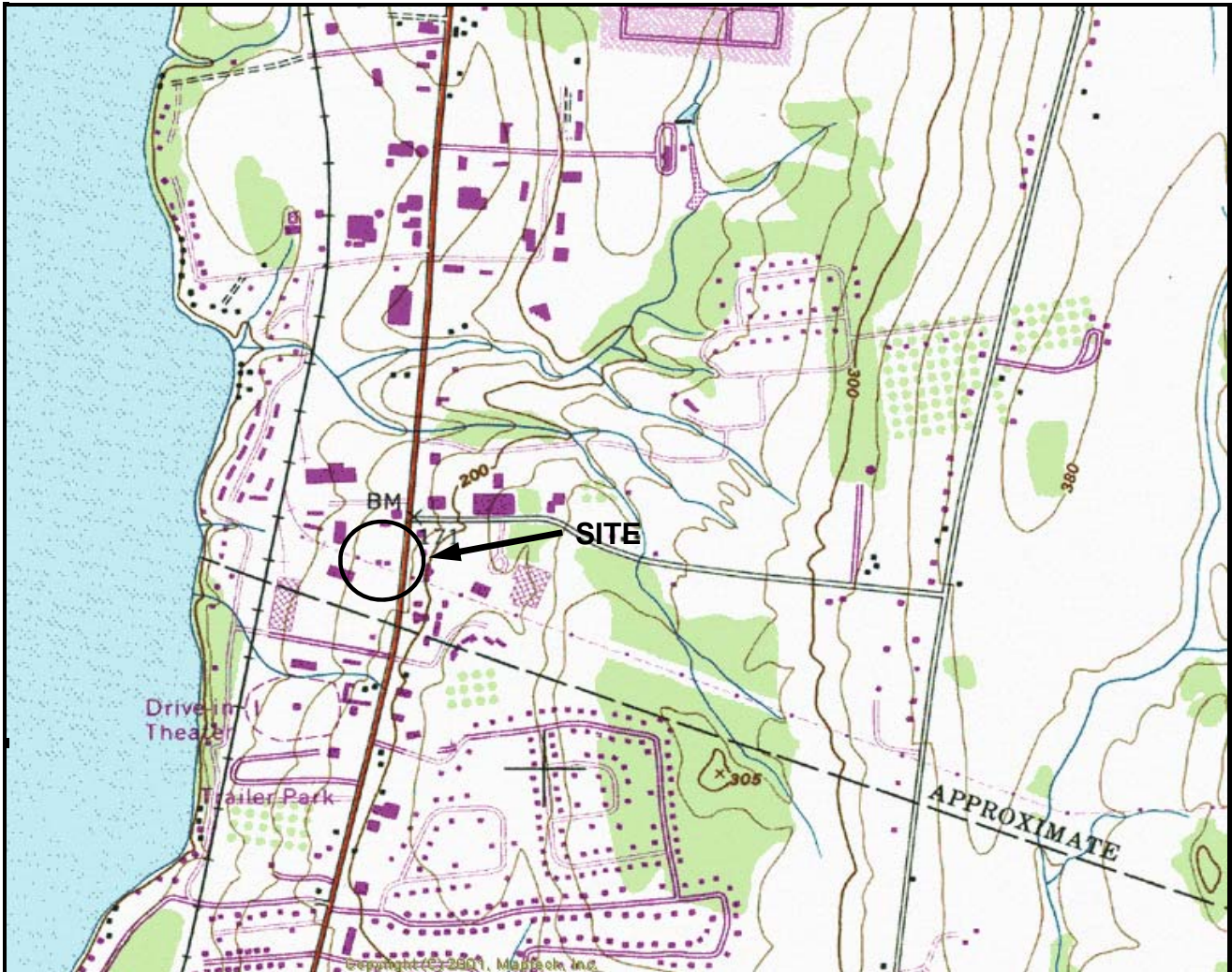
Based upon the above conclusions, KAS recommends the following actions:

1. Continued quarterly groundwater monitoring of key site-related wells, semi-annual sampling of perimeter wells and a visual inspection of sensitive receptors during each monitoring event; and,
2. Based on the influent vapor concentrations observed during the most recent reporting period, treatment with a CatOx may no longer be warranted therefore a cost evaluation to switch to carbon treatment should be performed. The system should be restarted in late-September and allowed to operate for one week to evaluate recharge rates and confirm influent vapor levels.



## **Appendix A**

- 1) Site Location Map**
- 2) Site Map**
- 3) Groundwater Contour Maps**
- 4) Contaminant Distribution Maps**



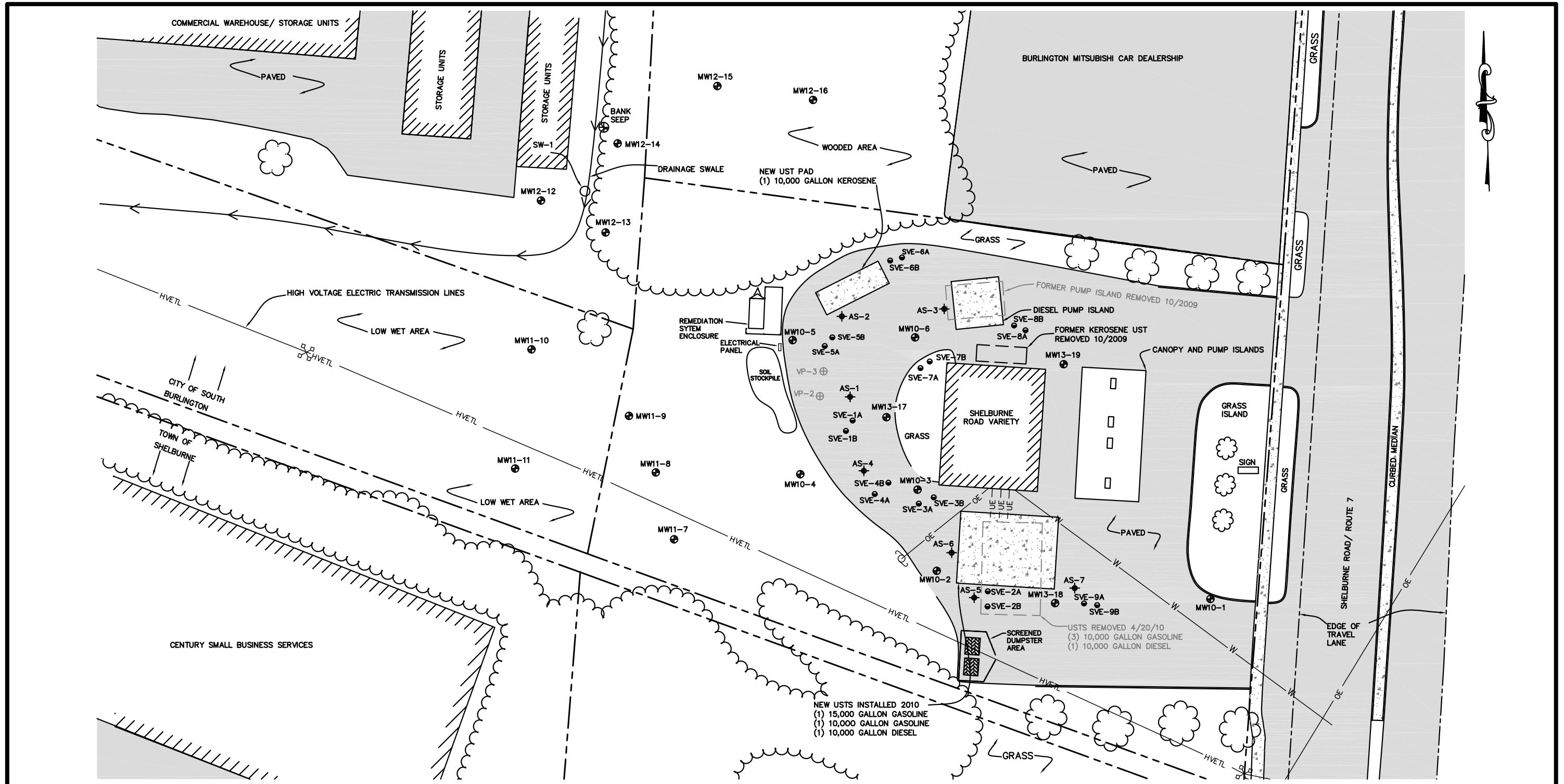
KAS Job Number: 410090357  
 Source: USGS 7.5' Mapping Mount Philo VT 1948, photorevised 1987



**Shelburne Road Variety**  
**1855 Shelburne Road**  
**South Burlington, VT**

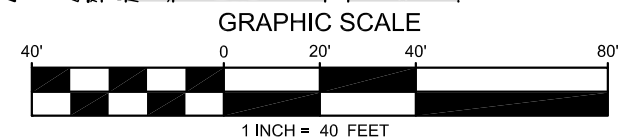
Site Location Map  
 USGS Mapping

Date: 10/29/09 Drawing No 1 Scale: 1:24,000 By: JR



**LEGEND**

- |        |                             |                          |   |
|--------|-----------------------------|--------------------------|---|
| MW10-1 | MONITORING WELL             | HVETL                    | HIGH VOLTAGE ELECTRIC TRANSMISSION LINES                      |
| OE     | OVERHEAD ELECTRIC           | High Voltage Pole Symbol | HIGH VOLTAGE ELECTRIC POLES                                   |
| VP-2   | VENT POINT, ABANDONED       | Utility Pole Symbol      | UTILITY POLE  |
| AS-1   | AIR SPARGE INJECTION POINT  | Asphalt Paving Symbol    | ASPHALT PAVING  |
| SVE-1A | SOIL VAPOR EXTRACTION POINT | Concrete Symbol          | CONCRETE  |
| W      | WATERLINE                   | Drainage Ditch Symbol    | DRAINAGE DITCH WITH DIRECTION OF FLOW                         |
| UE     | UNDERGROUND ELECTRIC        | Dashed Line Symbol       | APPROXIMATE PROPERTY LINE (PER VTRANS NATURAL RESOURCE ATLAS) |
|        |                             | Wavy Line Symbol         | TREE LINE   |



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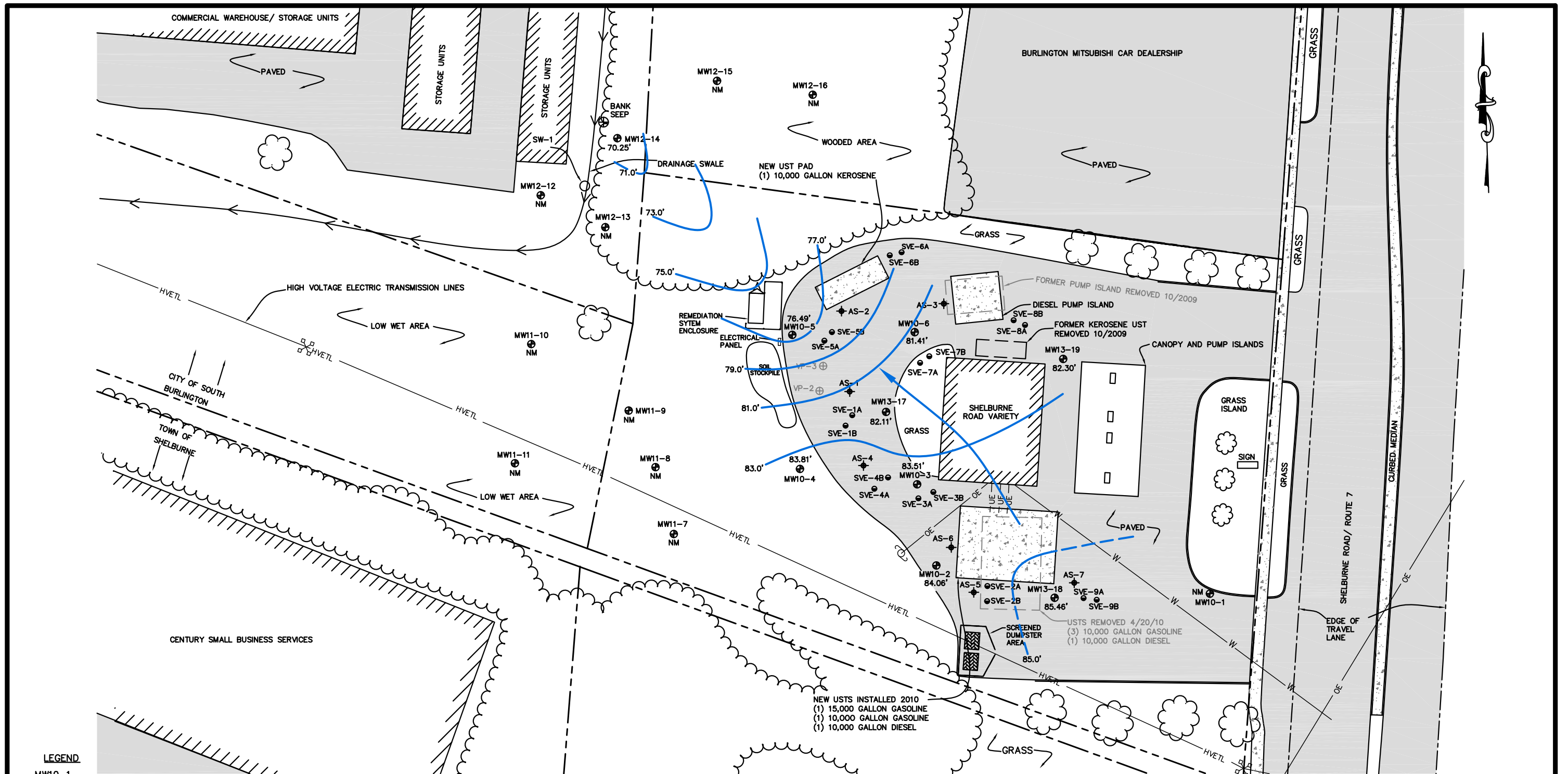
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environmental science & engineering

**SHELBURNE ROAD VARIETY**  
1855 SHELBURNE ROAD  
SOUTH BURLINGTON, VERMONT

**SITE MAP**

DATE: 9/2/16	DWG #: 1	SCALE: 1"=40'	DRN.: TB	APP.: RT
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KAS #: 410090357  
VTDEC #: 2010-4047

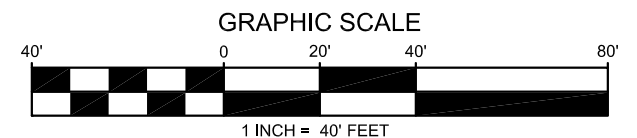


**LEGEND**

- MW10-1  
⊕  
NM  
MONITORING WELL WITH GROUNDWATER ELEVATION (FT)
- 83.0'  
GROUNDWATER ELEVATION CONTOUR (FT)
- ←  
APPROXIMATE GROUNDWATER FLOW DIRECTION
- NM  
NOT MEASURED
- NP  
NOT PLOTTED
- VP-2 ⊕  
VENT POINT, ABANDONED
- AS-1  
♦  
AIR SPARGE INJECTION POINT
- SVE-1A  
●  
SOIL VAPOR EXTRACTION POINT
- W  
WATERLINE
- UE  
UNDERGROUND ELECTRIC
- OE  
OVERHEAD ELECTRIC

- HVETL  
HIGH VOLTAGE ELECTRIC TRANSMISSION LINES
- ⊕  
HIGH VOLTAGE ELECTRIC POLES
- ⊕  
UTILITY POLE
- ▬  
ASPHALT PAVING
- ▬  
CONCRETE
- ←  
DRAINAGE DITCH WITH DIRECTION OF FLOW
- - -  
APPROXIMATE PROPERTY LINE (PER VTRANS NATURAL RESOURCE ATLAS)
- ~  
TREE LINE

\*SVE/AS WAS NOT OPERATING AT TIME OF GROUNDWATER MEASUREMENT



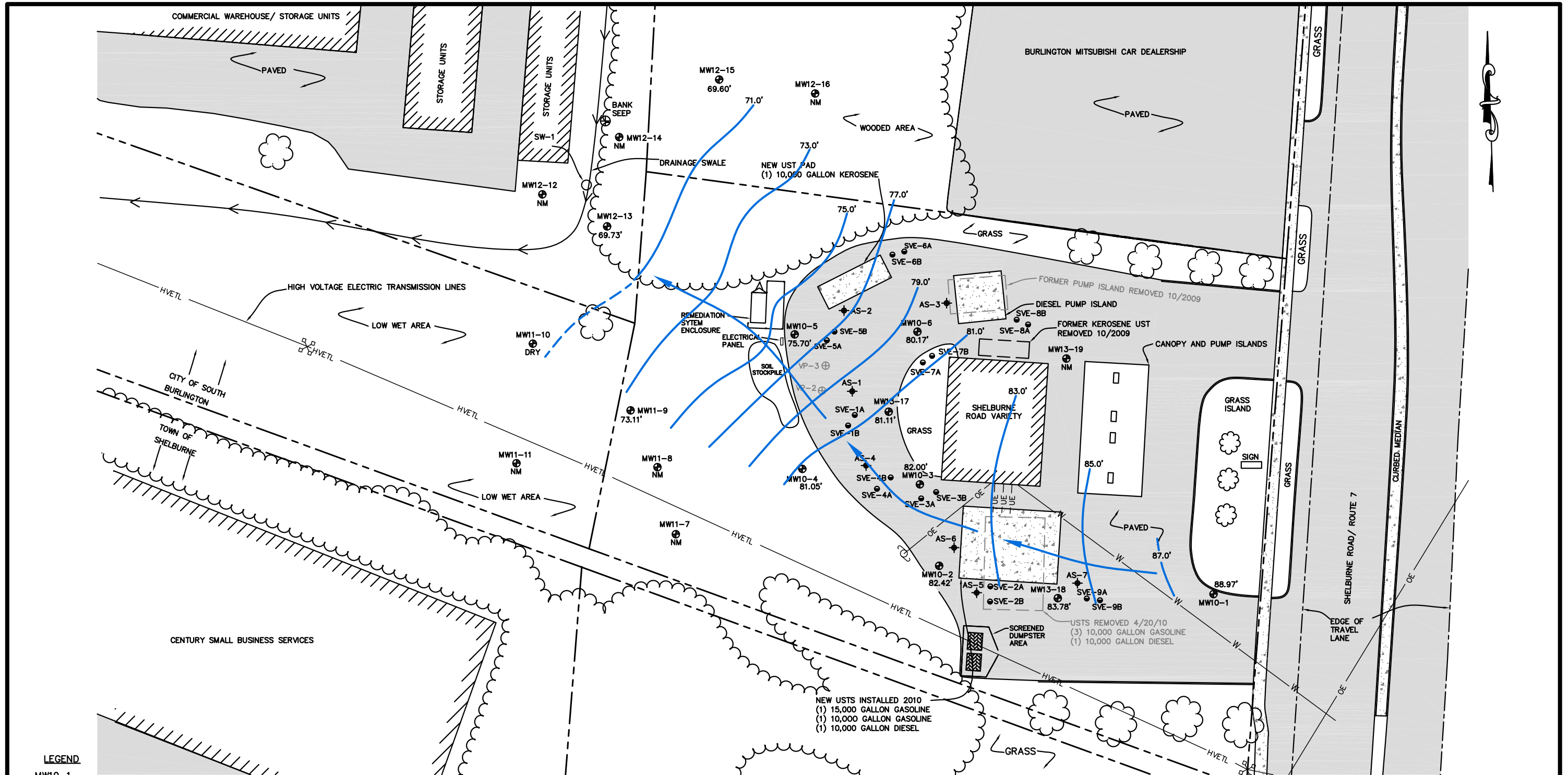
KAS #: 410090357  
VTDEC #: 2010-4047

589 Avenue D, Suite 10  
PO Box 787  
Williston, VT 05495  
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802 383.0486 p  
802 383.0490 f

**SHELBURNE ROAD VARIETY**  
1855 SHELBURNE ROAD  
SOUTH BURLINGTON, VERMONT

**GROUNDWATER CONTOUR MAP**  
MEASURED: 3/30/16

DATE: 4/12/16	DWG #: 2	SCALE: 1"=40'	DRN.: TB	APP.: RT
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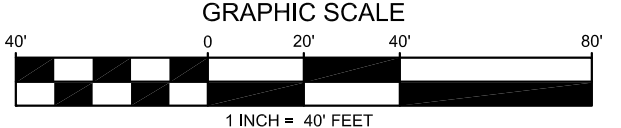
**LEGEND**

- MW10-1  
88.97'  
83.0'
- NM
- NP
- VP-2
- AS-1
- SVE-1A
- W
- UE
- OE

- MONITORING WELL WITH GROUNDWATER ELEVATION (FT)
- GROUNDWATER ELEVATION CONTOUR (FT; DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- NOT MEASURED
- NOT PLOTTED
- VENT POINT, ABANDONED
- AIR SPARGE INJECTION POINT
- SOIL VAPOR EXTRACTION POINT
- WATERLINE
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC

- HVETL
- High Voltage Electric Poles
- UTILITY POLE
- ASPHALT PAVING
- CONCRETE
- DRAINAGE DITCH WITH DIRECTION OF FLOW
- APPROXIMATE PROPERTY LINE (PER VTRANS NATURAL RESOURCE ATLAS)
- TREE LINE

\*SVE/AS WAS NOT OPERATING AT TIME OF GROUNDWATER MEASUREMENT



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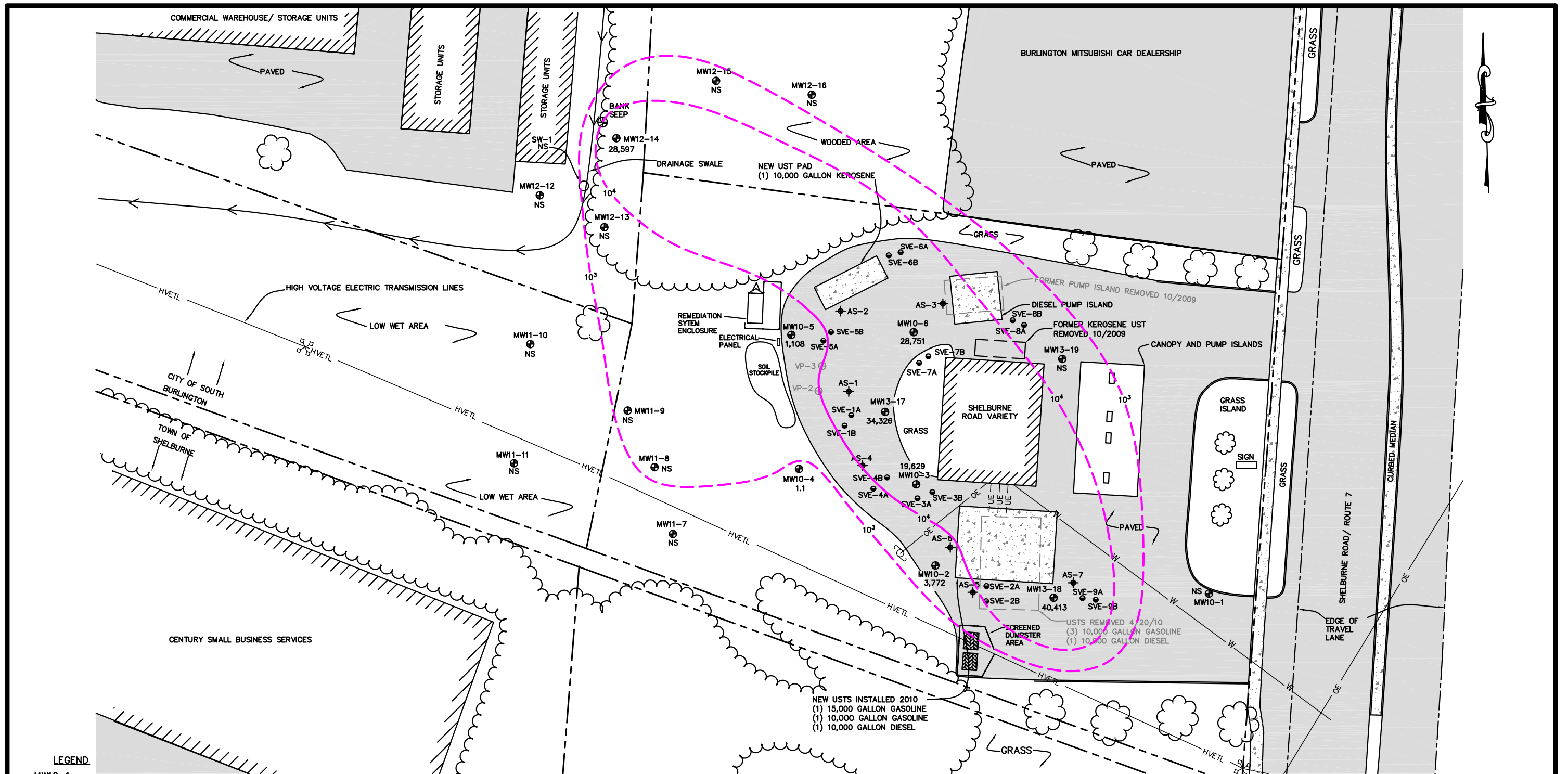
802 383.0486 p  
802 383.0490 f

**SHELburne ROAD VARIETY**  
1855 SHELburne ROAD  
SOUTH BURLINGTON, VERMONT

**GROUNDWATER CONTOUR MAP**  
MEASURED: 7/8/16

DATE: 9/14/16	DWG #: 2	SCALE: 1"=40'	DRN.: TB	APP.: RT
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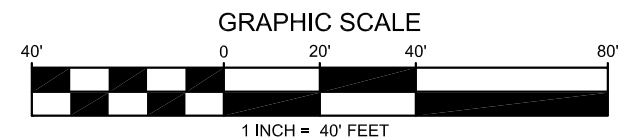
KAS #: 410090357  
VTDEC #: 2010-4047



**LEGEND**

- |                   |   |           |  |
|-------------------|---|-----------|--|
| MW10-1<br>●<br>NS | MONITORING WELL WITH TOTAL TARGETED VOC CONTAMINANT CONCENTRATION (ppb; M=8021B)      | — OE —    | OVERHEAD ELECTRIC  |
| SW-1<br>●<br>NS   | SURFACE WATER SAMPLE WITH TOTAL TARGETED VOC CONTAMINANT CONCENTRATION (ppb; M=8021B) | — HVETL — | HIGH VOLTAGE ELECTRIC TRANSMISSION LINES                       |
| 10 <sup>3</sup>   | CONTAMINANT CONCENTRATION CONTOUR (ppb)   | ⊕         | HIGH VOLTAGE ELECTRIC POLES                                    |
| ND                | NONE DETECTED   | ⊙         | UTILITY POLE   |
| NS                | NOT SAMPLED   | ▬         | ASPHALT PAVING   |
| LNAPL             | LIGHT NON-AQUEOUS PHASE LIQUID  | ▬         | CONCRETE   |
| VP-2 ⊕            | VENT POINT, ABANDONED   | ←←←       | DRAINAGE DITCH WITH DIRECTION OF FLOW                          |
| AS-1              | AIR SPARGE INJECTION POINT  | ---       | APPROXIMATE PROPERTY LINE (PER VTTRANS NATURAL RESOURCE ATLAS) |
| SVE-1A            | SOIL VAPOR EXTRACTION POINT   | ~~~~~     | TREE LINE  |
| W                 | WATERLINE   |           |  |
| UE                | UNDERGROUND ELECTRIC  |           |  |

NOTE: SVE/AS OPERATING AT TIME OF SAMPLING



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802 383.0490 f

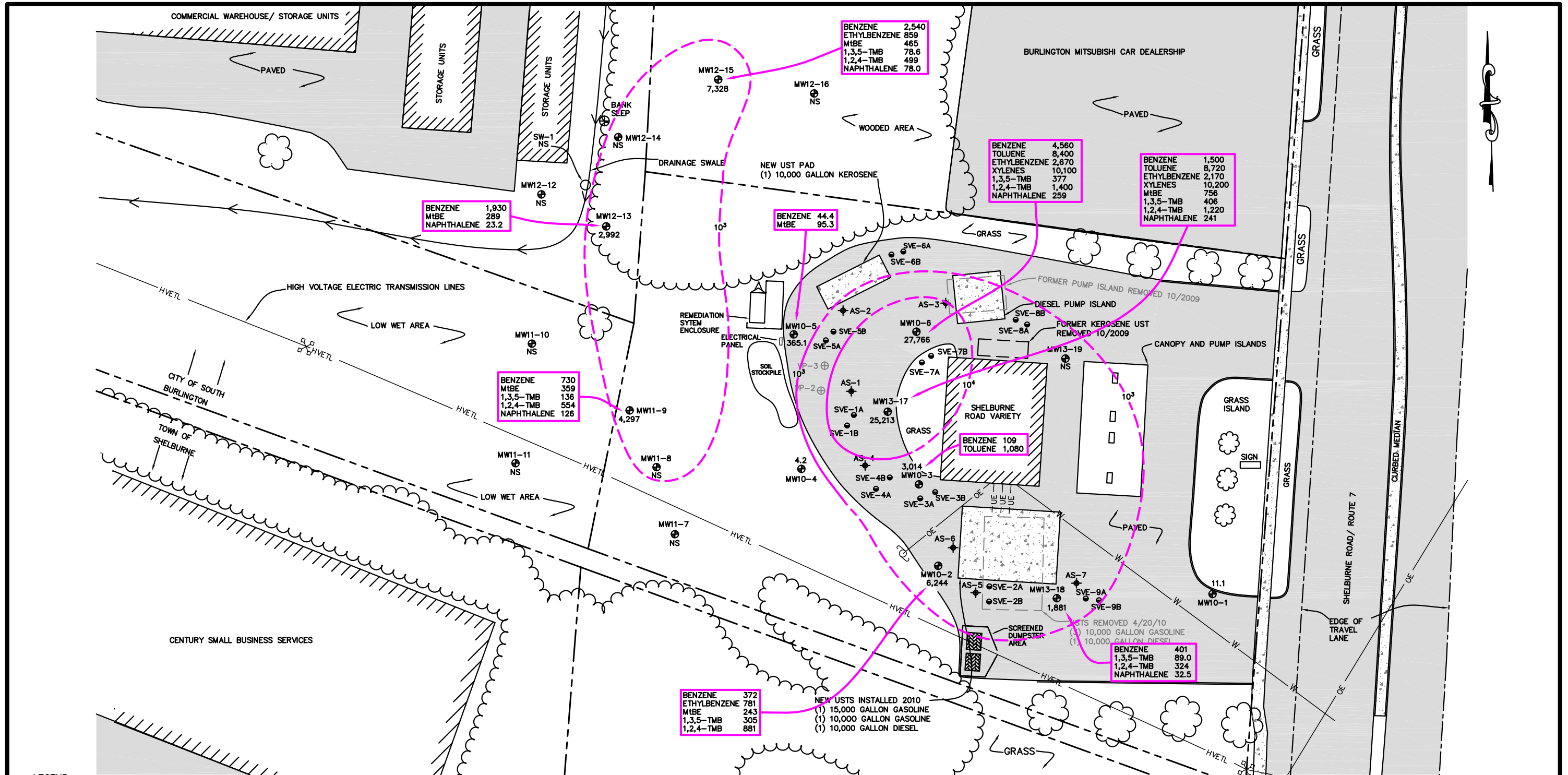
**SHELBURNE ROAD VARIETY**  
1855 SHELBURNE ROAD  
SOUTH BURLINGTON, VERMONT

**CONTAMINANT DISTRIBUTION MAP**  
SAMPLED: 3/30/16

DATE: 4/12/16	DWG #: 3	SCALE: 1"=40'	DRN.: TB	APP.: RT
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KAS #: 410090357  
VTDEC #: 2010-4047

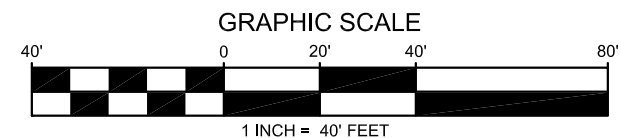




**LEGEND**

MW10-1 11.1	MONITORING WELL WITH TOTAL TARGETED VOC CONTAMINANT CONCENTRATION (ppb; M=8021B)
SW-1 NS	SURFACE WATER SAMPLE WITH TOTAL TARGETED VOC CONTAMINANT CONCENTRATION (ppb; M=8021B)
10 <sup>3</sup>	CONTAMINANT CONCENTRATION CONTOUR (ppb)
ND	NONE DETECTED
NS	NOT SAMPLED
MtBE 289	VOC EXCEEDANCE OF VGES
MtBE ; TMB	METHYL t-BUTYL ETHER ; TRIMETHYLBENZENE
VP-2⊕	VENT POINT, ABANDONED
AS-1	AIR SPARGE INJECTION POINT
SVE-1A	SOIL VAPOR EXTRACTION POINT

OE	OVERHEAD ELECTRIC
HVETL	HIGH VOLTAGE ELECTRIC TRANSMISSION LINES
	HIGH VOLTAGE ELECTRIC POLES
	UTILITY POLE
	ASPHALT PAVING
	CONCRETE
	DRAINAGE DITCH WITH DIRECTION OF FLOW
	APPROXIMATE PROPERTY LINE (PER VTRANS NATURAL RESOURCE ATLAS)
	TREE LINE
W	WATERLINE
UE	UNDERGROUND ELECTRIC



NOTE: SVE/AS OPERATING AT TIME OF SAMPLING

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**SHELBURNE ROAD VARIETY**  
 1855 SHELBURNE ROAD  
 SOUTH BURLINGTON, VERMONT

**CONTAMINANT DISTRIBUTION MAP**  
 SAMPLED: 7/8/16

DATE: 9/2/16	DWG #: 3	SCALE: 1"=40'	DRN.: TB	APP.: RT
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BENZENE	372
ETHYLBENZENE	781
MtBE	243
1,3,5-TMB	305
1,2,4-TMB	881

NEW USTS INSTALLED 2010  
 (1) 15,000 GALLON GASOLINE  
 (1) 10,000 GALLON GASOLINE  
 (1) 10,000 GALLON DIESEL

BENZENE	2,540
ETHYLBENZENE	859
MtBE	485
1,3,5-TMB	78.6
1,2,4-TMB	499
NAPHTHALENE	78.0

BENZENE	4,560
TOLUENE	8,400
ETHYLBENZENE	2,670
XYLENES	10,100
1,3,5-TMB	377
1,2,4-TMB	1,400
NAPHTHALENE	259

BENZENE	1,500
TOLUENE	8,720
ETHYLBENZENE	2,170
XYLENES	10,200
MtBE	756
1,3,5-TMB	406
1,2,4-TMB	1,220
NAPHTHALENE	241

BENZENE	1,930
MtBE	289
NAPHTHALENE	23.2

BENZENE	44.4
MtBE	95.3

BENZENE	730
MtBE	359
1,3,5-TMB	136
1,2,4-TMB	554
NAPHTHALENE	126

BENZENE	109
TOLUENE	1,080

BENZENE	401
1,3,5-TMB	89.0
1,2,4-TMB	324
NAPHTHALENE	32.5



## **Appendix B**

### **SVE/AS System Operational Data**





### SVE System Operational Data

Shelburne Road Variety  
South Burlington, Vermont

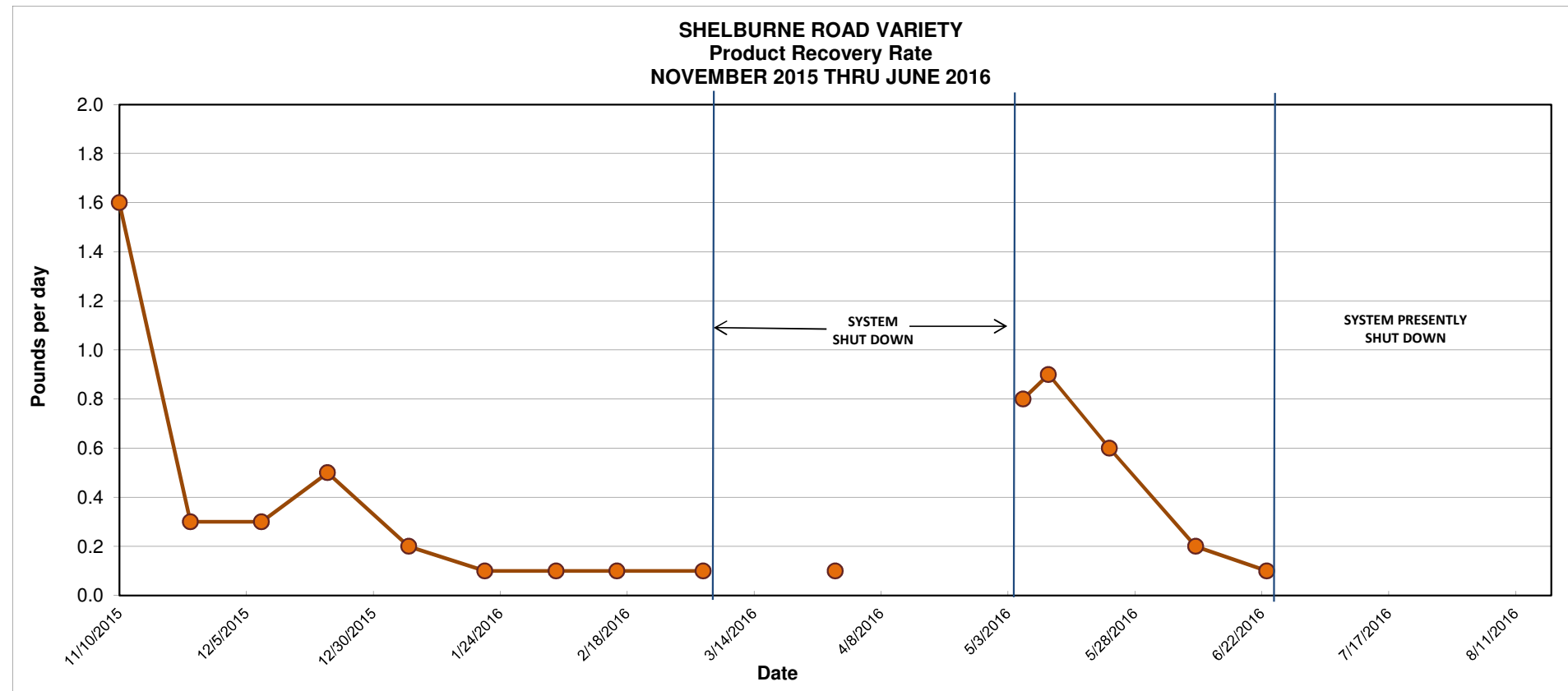
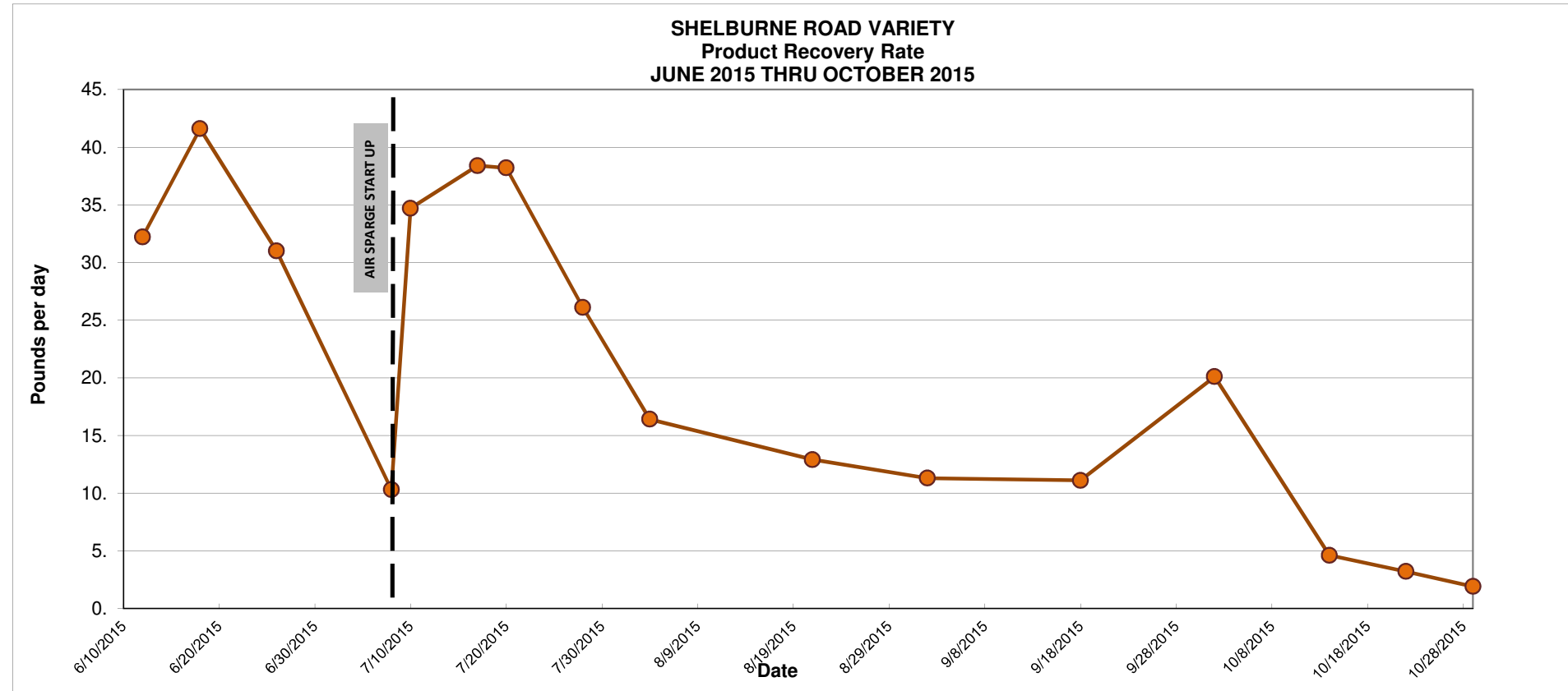
PERIOD ENDING	FALCO HOUR METER	AIR SPARGE (status)	PID USED	SVE-1A		SVE-1B		SVE-2A		SVE-2B		SVE-3A		SVE-3B		SVE-4A		SVE-4B		SVE-5A		SVE-5B		SVE-6A		SVE-6B		SVE-7A		SVE-7B		SVE-8A		SVE-8B		SVE-9A		SVE-9B		Notes
				PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	PID (ppmv)	VAC (in H2O)	
6/11/2015	13.1	off	MiniRae	116.3	-	385.2	-	83.8	-	723.2	-	264.2	-	568.5	-	209.7	-	192.6	-	34.4	-	146.9	-	21.2	-	125.6	-	206.9	-	578.2	-	31.7	-	364.9	-	401.1	-	581.6	-	
6/12/2015	36.7	off	MiniRae	173.2	-	208.1	-	108.9	-	91.4	-	203	-	385	-	197.2	-	363.2	-	24.7	-	53.2	-	22.6	-	41.5	-	240	-	531.1	-	368.2	-	296.3	-	622	-	675.2	-	
6/18/2015	175.1	off	MiniRae	222.0	34	3.2	33	2.9	32	3.0	34	49.1	31	167.8	32	31.7	34	392.7	33	2.1	33	2.4	31	3.2	30	6.3	34	231.7	32	61.6	34	467.5	32	185.3	32	693.6	32			
	-	off	MiniRae	200.4	32	closed		closed		closed		232.7	31	206.4	31	205.3	31	496.2	31	closed		closed		closed		closed		344.8	30	75.5	31	563	31	244.7	32	794.2	30			
6/26/2015	299.7	off	MiniRae	214.8	31	28.0	31	23.5	31	366.1	31	53.4	30	60.6	30	23.4	31	624.3	31	1.8	31	4.0	31	3.9	31	10.3	30	38.5	31	398.7	31	291.1	31	732.1	31	285.1	30	43.0	30	
7/8/2015	560.4	off	MiniRae	32.7	30	0.0	31	0.0	29	0.0	31	53.3	30	19.2	30	0.0	30	0.0	31	0.0	31	0.0	31	0.8	30	1.4	30	0.0	31	11.0	30	0.0	30	181.5	30	142.1	31	1.0	30	water observed in SVE-1B
7/10/2015	606.0	on	MiniRae	243.8	-	62.1	-	625.9	-	42.7	-	458.3	-	40.6	-	657.2	-	47.0	-	331.5	-	37.3	-	368.1	-	38.7	-	653.6	-	140.2	-	312.5	-	494.0	-	427.2	-	234.2	-	AS startup, running for 30 min
	608.6	on	MiniRae	319.6	31	239.4	30	507.3	30	237.7	30	560.4	31	52.3	31	550.4	31	270.7	31	346.6	30	214.4	31	408.0	31	200.4	31	489.6	31	272.2	31	497.2	32	261.5	30	641.5	30	325.9	30	
7/17/2015	777.9	on	IonScience	794.0	30	237	32	1,130	32	31.3	32	972.0	32	124	31	905.0	32	35.0	32	173.0	32	30.3	32	218.0	32	26.2	32	771.0	32	99.8	32	193.0	32	675	32	676.0	31	72.0	32	
7/20/2015	842.9	on	IonScience	817.0	31	396	31	1,170	31	232	31	1,400	31	183	31	1,140	31	346.0	31	1,020	31	299.0	31	1,190	31	296	31	1,270	31	446.0	31	347.0	31	875	31	1,140	31	157.0	31	
7/28/2015	1,035.0	on	MiniRae	760.7	29	-	30	623.6	30	19.8	30	703.2	30	185.6	30	656.2	30	18.5	30	917.0	30	23.6	30	495.2	30	29.1	30	602.6	30	64.9	30	670.5	29	22.2	30	252.2	30	80.7	30	water observed in SVE-1B
8/4/2015	1,202.9	on	MiniRae	611.5	31	12.8	30	279.3	31	9.2	31	491.2	31	64.2	31	593.0	31	12.0	31	380.2	31	15.7	30	225.2	29	15.3	32	522.5	30	53.2	30	730.5	32	14.2	31	50.2	31	64.2	31	
8/21/2015	1,611.1	on	MiniRae	335.2	30	6.1	30	175.1	30	3.4	30	192.2	30	54.1	30	108.1	30	23.2	30	178.1	30	3.8	30	12.1	30	4.5	30	151.2	30	15.1	30	632.1	30	2.5	30	19.6	30	39.5	30	water observed in SVE-1B
9/2/2015	1,853.2	on	MiniRae	279.7	-	1.1	-	155.3	-	1.5	-	168.2	-	62.4	-	86.2	-	0.8	-	9.2	-	2.5	-	4.3	-	1.3	-	120.7	-	4.8	-	457.1	-	5.8	-	11.1	-	14.0	-	mag gauge malfunction.
9/18/2015	2,237.3	on	MiniRae	337.1	38	1.6	11	159.3	38	0.5	40	525.4	38	324.5	38.5	142.2	38.5	2.8	38.5	5.4	32	1.1	39.1	5.7	37.5	0.8	38.5	218.8	38.5	1.4	39	791.1	38.5	2.9	38.5	3.2	38.5	20.3	20	lean wells closed 1/2 way (1B thru 9B, 5A, 6A, 9A)
10/2/2015	2,571.4	on	MiniRae	580.4	>40	1.1	closed	78.6	>40	0.0	closed	70.5	>40	63.0	>40	41.9	>40	0.0	closed	6.9	38	0.0	closed	0.1	38	0.0	closed	68.3	>40	0.0	closed	700.3	>40	48.3	closed	3.7	>40	0.0	28	water observed in SVE-5B; lean wells closed (1B, 2B, 4B thru 8B); lean wells closed 1/2 way (5A, 6A, 9A/B)
10/14/2015	2,860.6	on	IonScience	708.0	>40	29.6	closed	52.5	>40	4.9	closed	84.1	>40	57.0	>40	59.1	>40	4.2	closed	23.3	37	8.5	closed	0.8	34	23.9	closed	112.0	>40	2.9	closed	1200.0	>40	174	closed	8.7	>40	9.6	29	water observed in SVE-1A; opened 8B 1/2 way
10/29/2015	3,222.2	on	MiniRae	727.8	>40	6.2	closed	53.9	>40	2.6	closed	85.5	>40	73.7	>40	33.9	>40	18.2	closed	83.9	36	14.8	closed	22.7	35	42.1	closed	75.9	>40	12.2	>40	119.2	>40	47.3	>40	16.6	>40	33.8	36	water observed in SVE-1A and 5B
11/10/2015	3,511.6	on	MiniRae	579.4	>40	68.2	closed	101.2	>40	7.5	closed	42.7	>40	42.3	>40	35.7	>40	51.1	closed	39.9	>40	22.5	closed	15.2	>40	33.8	closed	67.2	>40	21.9	>40	481.2	>40	34.5	>40	30.5	>40	26.8	>40	opened all deep, closed all shallow half way
11/24/2015	3,844.0	on	MiniRae	235.6	>40	113.4	>40	10.5	>40	1.9	>40	17.2	>40	34.1	>40	13.4	>40	8.2	>40	12.4	>40	4.7	>40	3.6	>40	2.3	>40	22.0	>40	3.4	>40	5.8	>40	26.8	>40	5.4	>40	3	>40	water observed in SVE-1A, 8A, 9A
12/8/2015	3,942.9	on	MiniRae	98.1	>40	194	>40	19.3	>40	0.9	>40	15.1	>40	16.6	>40	-	>40	13.6	>40	0.6	>40	0.3	>40	0.5	>40	0.1	>40	18.7	>40	13.9	>40	2.9	>40	31.4	>40	22.2	>40	17.3	>40	water observed in SVE-4A
12/21/2015	4,250.6	on	MiniRae	0.0	>40	30.7	>40	2.0	>40	0.0	>40	9.3	>40	26.3	>40	4.8	>40	0.1	>40	0.0	>40	0.0	>40	0.0	>40	-	>40	-	>40	0.4	>40	-	>40	0.9	>40	2.2	>40	0.1	>40	water observed in SVE-7A, 8A, 5B, 6B
1/6/2016	4,635.8	on	MiniRae	37.5	>40	0.8	18	5.1	28	-	>40	2.6	15	6.4	15	-	>40	0.0	14	0.5	>40	-	18	0.0	>40	-	>40	-	>40	0.0	14	-	>40	0.0	15	-	>40	0.0	15	water observed in SVE-4A, 7A, 8A, 9A, 2B, 5B, 6B
1/21/2016	4,970.4	on	MiniRae	0.5	20.0	0.1	15	0.9	27	0.0	>40	1.2	>40	1.0	15	0.5	>40	0.0	14	0.5	>40	0.0	14	0.4	21	0.1	>40	0.6	>40	0.6	14	0.5	>40	0.1	15	0.8	16	0.0	15	water observed in SVE-2B
2/4/2016	5,306.5	on	MiniRae	4.1	>40	0.4	18	1.5	27	-	>40	-	>40	1.4	16	-	>40	0.4	15	0.4	>40	-	18	0.0	>40	-	>40	-	>40	0.1	16	-	>40	0.3	17	-	>40	0.1	17	no water, closed all deep half way, except 3B upon depart 100% upon depart
2/16/2016	5,595.1	on	MiniRae	11.1	35	0.2	37	5.0	36	0.2	38	4.8	36	25.8	38	2.5	36	0.2	37	0.1	36	0.3	38	0.1	36	0.2	37	3.7	37	1.1	37	2.0	36	0.4	38	1.2	36	0.4	37	system shutdown upon departure to evaluate recharge
3/4/2016	6,500.1	on	MiniRae	23.4	37	0.1	39	4.5	37	0.1	40	4.9	38	1.6	39	2.8	37	0.1	39	0.1	38	0.2	39	0.1	37	4.0	38	0.3	39	5.2	37	0.4	39	0.9	38	0.3	39	brief restart; all measurements taken without vacuum pump		
3/30/2016	6,006.5	on	MiniRae	0.6	-	3.2	-	0.1	-	0.7	-	0.3	-	0.2	-	0.2	-	2.1	-	0.8	-	1.0	-	0.7	-	1.1	-	1.1	-	0.5	-	0.7	-	1.9	-	0.0	-	1.4	-	restart, AS off
5/6/2016	6,007.3	off	MiniRae	3.0	-	0.0	-	0.3	-	0.6	-	0.2	-	0.2	-	0.4	-	0.9	-	0.7	-	0.7	-	0.1	-	0.6	-	0.0	-	0.1	-	0.3	-	0.4	-	0.2	-	0.1	-	
	6,011.0	on	MiniRae	2.2	36	0.0	38	17.1	37.0	0.0	38	11.7	37	5.2	38	8.0	37	0.0	38	0.0	37	0.0	38	0.0	37	0.0	38	13.5	37	1.3	38	1.8	36	0.0	38	4.0	37	2.3	38	
5/11/2016	6,127.7	on	MiniRae	7.8	38	0.0	>40	14.0	>40	0.0	>40																													

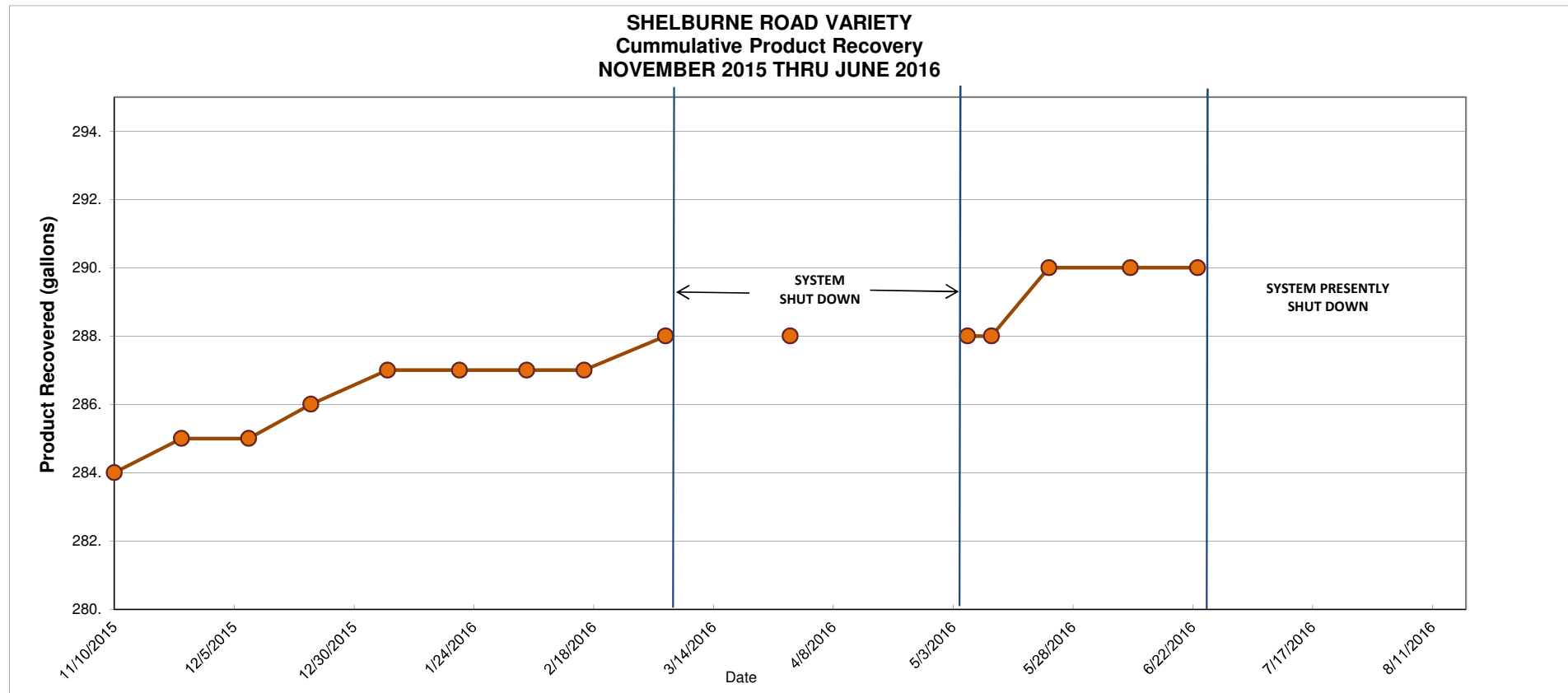
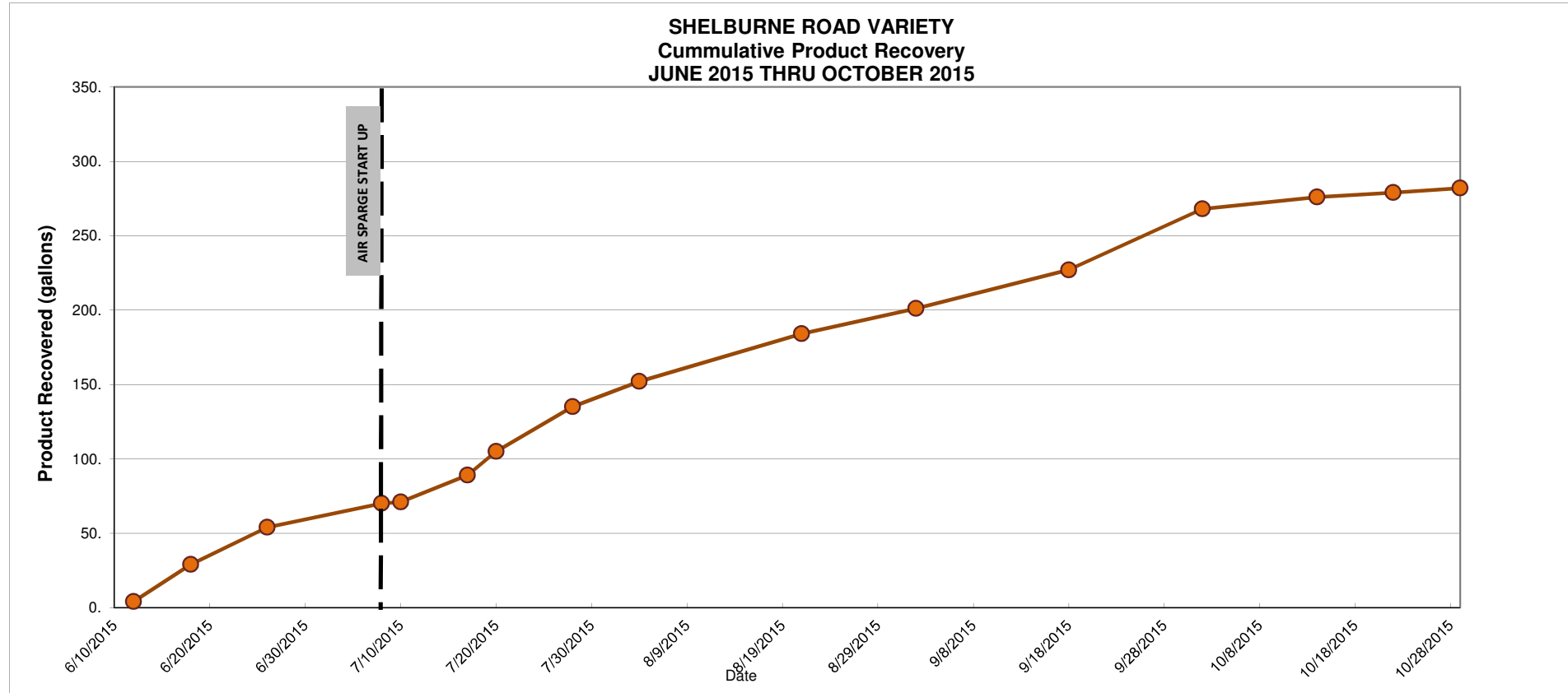


## AS System Operational Data

Shelburne Road Variety  
South Burlington, Vermont

PERIOD ENDING	FALCO HOUR METER	SPARGE TEMP (deg F)	SPARGE PRESSURE (psi)	AS-1		AS-2		AS-3		AS-4		AS-5		AS-6		AS-7		Notes
				FLOW (cfm)	PRESSURE (psi)	FLOW (cfm)	PRESSURE (psi)	FLOW (cfm)	PRESSURE (psi)	FLOW (cfm)	PRESSURE (psi)	FLOW (cfm)	PRESSURE (psi)	FLOW (cfm)	PRESSURE (psi)	FLOW (cfm)	PRESSURE (psi)	
7/10/2015	606.0	210.0	15.0	2.5	18.0	2.5	20.0	2.0	21.5	4.0	20.0	4.0	7.0	4.0	7.5	4.0	4.0	initial startup, thermal overload shutdown after 30 min (225 deg F / 17psi)
	607.1	225.0	13.0	2.5	17.0	2.5	20.0	2.0	21.0	4.5	19.0	4.0	5.0	4.0	7.0	4.0	3.5	system restart, thermal overload shutdown after 40 min (240 deg F / 16 psi)
	607.7	175.0	11.0	2.5	16.0	2.5	17.0	2.0	18.0	4.0	17.5	4.0	6.0	4.0	6.0	4.0	3.5	
	608.6	190.0	10.5	2.5	16.0	2.5	16.5	2.0	18.0	4.0	13.5	4.0	5.0	4.0	5.5	4.0	2.5	system operating @ 200 deg F / 9.5 psi upon departure
7/17/2015	774.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	system off upon arrival
	775.2	145.0	8.0	2.0	14.5	2.0	-	2.0	14.0	3.0	13.0	3.0	6.5	3.0	9.0	3.0	3.0	system restart, pressure lowered, AS-2 press. gauge not working
	775.9	180.0	8.0	2.5	15.0	2.5	-	2.0	15.0	4.0	14.5	5.0	7.0	5.5	9.5	5.5	4.0	
	776.9	205.0	8.0	2.0	15.0	3.0	-	2.0	15.5	4.5	15.0	5.5	7.5	6.0	9.0	6.0	3.5	
	777.9	200.0	8.0	2.0	15.0	3.5	-	2.0	15.5	4.5	14.5	5.0	6.0	6.0	8.0	5.5	3.5	
7/20/2015	842.9	200.0	8.0	2.5	15.0	6.5	-	2.0	15.5	4.0	14.5	5.5	4.0	6.5	6.5	5.5	3.0	
7/28/2015	1,035.0	200.0	9.0	2.0	15.0	6.0	15.0	2.0	17.5	3.0	16.0	5.0	3.5	5.0	5.0	5.0	2.5	replaced AS-2 press. gauge, increased flow in all points prior to depart.
8/4/2015	1,202.9	200.0	7.0	2.0	15.0	7.0	10.0	1.0	15.0	3.0	13.0	5.0	6.0	6.0	5.0	9.0	4.0	
8/21/2015	1,611.1	205.0	9.0	2.0	15.0	6.5	10.0	1.0	17.0	3.0	14.5	15.5	6.0	6.0	5.0	9.5	4.0	
	1,612.3	205.0	7.0	2.0	15.0	6.0	10.0	1.0	16.5	3.0	14.0	12.0	4.5	8.5	7.5	11.5	5.0	
9/2/2015	1,853.2	200.0	7.5	1.0	15.0	2.0	8.0	1.0	22.0	2.0	13.0	13.0	6.0	10.5	10.0	13.0	5.5	
9/18/2015	2,237.3	195.0	5.8	1.0	15.0	2.0	5.0	1.0	25.0	2.5	12.0	13.0	4.5	15.5	7.0	11.8	4.8	
	2,287.3	195.0	5.5	1.0	14.5	2.5	5.0	1.0	25.0	2.5	11.0	13.0	4.5	15.0	7.0	11.5	4.5	
10/2/2015	2,571.4	170.0	7.0	2.0	15.0	5.0	6.0	1.0	22.5	4.0	11.0	12.5	4.0	15.25	6.5	11.25	4.5	
10/14/2015	2,860.6	175.0	7.0	3.0	15.0	5.0	4.0	1.0	26.0	3.3	11.0	12.5	4.0	15.0	6.0	11.0	4.5	
10/22/2015	3,027.1	155.0	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	GWM - air flow observed in MW13-19, MW10-2
	3,032.8	155.0	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	reduced overall sparge flow with check valve, lowered AS-6
10/29/2015	3,222.2	160.0	6.0	3.7	15.0	5.0	4.0	1.0	27.0	3.0	12.0	8.9	2.0	8.5	3.0	9.0	3.0	
11/10/2015	3,511.6	180.0	6.0	3.8	15.0	5.0	4.0	1.0	27.0	3.0	11.0	8.8	2.0	8.8	3.0	9.0	3.0	reduced all AS to operate at less than 4 cfm
	3,513.7	185.0	7.0	3.8	15.0	4.0	4.0	1.0	27.0	2.5	14.0	4.0	1.0	4.0	2.5	4.0	2.0	
11/24/2015	3,844.0	180.0	6.0	3.0	15.0	3.5	2.0	1.0	>30	3.0	13.8	3.5	0.5	3.5	2.8	3.5	1.0	increased all AS to levels prior to 11/10/15
12/8/2015	3,941.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	system off upon arrival
	3,942.9	165.0	7.0	1.0	15.0	1.0	3.0	1.0	>30	1.0	13.0	8.0	5.0	6.5	7.0	7.5	2.5	system restart
1/6/2016	4,365.8	155.0	5.3	2.0	14.8	3.3	1.0	1.0	>30	2.25	22.0	9.5	3.0	9.5	4.5	6.8	2.5	system shutdown upon departure for GWM event next day
1/21/2016	4,970.4	150.0	6.0	2.0	15.0	3.5	2.0	2.0	>30	2.5	26.0	10.0	3.0	9.0	4.0	7.0	2.0	lowered AS-5 and AS-6 to 8cfm upon departure
2/4/2016	5,306.5	168.0	5.4	2.0	15.0	4.0	1.0	1.0	>30	1.0	-	7.5	2.5	8.0	4.0	7.0	2.5	repaired AS-4 gauge during shutdown, increased system pressure to 7.5 psi
2/16/2016	5,595.1	170.0	6.5	2.0	15.0	3.5	1.0	2.0	>30	2.0	24.0	9.0	2.0	9.5	4.0	8.0	3.0	
3/4/2016	6,500.1	165.0	7.0	2.0	15.0	5.0	1.0	2.0	>30	2.5	25.0	9.0	3.0	9.0	4.0	8.0	3.0	system shutdown upon departure to evaluate recharge
5/6/2016	6,007.4	145.0	8.0	1.0	15.0	1.0	0.0	1.0	>30	1.0	25.0	4.25	6.5	3.5	8.0	7.25	3.5	system restart
	6,008.0	185.0	7.5	1.0	15.0	1.0	0.0	1.0	>30	2.0	25.0	6.25	5.0	5.5	7.0	7.5	3.5	
	6,009.7	185.0	8.5	1.0	15.0	1.0	0.0	1.0	>30	2.5	26.0	7.5	5.0	7.0	7.0	8.0	3.5	
	6,011.0	180.0	8.5	1.0	15.0	1.0	0.0	1.0	>30	3.0	26.0	8.0	5.0	7.5	6.5	8.0	3.5	
5/11/2016	6,127.7	175.0	6.5	1.0	15.0	1.0	1.0	1.0	>30	4.0	25.0	7.75	3.0	7.75	5.0	7.25	3.5	decreased flow in AS-5,-6, -7 (to 7psi) and opened flow -1, -2, -3 upon depart. Sys press 7.5
5/23/2016	6,417.9	185.0	6.5	2.0	15.0	1.0	1.0	1.0	>30	4.0	25.0	6.5	2.5	7.0	4.5	6.5	2.5	
6/9/2016	6,822.4	190.0	7.0	2.0	15.0	1.0	1.0	1.0	>30	4.5	25.0	6.5	2.5	6.5	4.5	6.5	2.5	
6/23/2016	7,156.5	180.0	8.0	2.0	15.0	1.0	1.0	1.0	>30	3.5	25.0	6.5	2.0	6.5	4.5	6.5	2.5	system shutdown upon departure due to poor recovery rates.













## **Appendix C**

### **Liquid Level Monitoring Data**



## LIQUID LEVEL MONITORING DATA

Shelburne Road Variety  
So. Burlington, Vermont

### Measurement Date: March 30, 2016

Well I.D.	Well Depth bsg	Well Depth btoc	Top of Casing Elevation	Depth To Product btoc	Depth To Water btoc	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW10-2	23.00	22.50	100.00	-	15.94	-	-	-	-	84.06
MW10-3	20.00	19.50	99.66	-	16.15	-	-	-	-	83.51
MW10-4	20.00	19.50	98.23	-	14.42	-	-	-	-	83.81
MW10-5	25.00	24.50	97.98	-	21.49	-	-	-	-	76.49
MW10-6	25.00	24.50	99.33	-	17.92	-	-	-	-	81.41
MW12-14	6.00	9.00	74.79	-	4.54	-	-	-	-	70.25
MW13-17	23.00	22.50	99.25	-	17.14	-	-	-	-	82.11
MW13-18	20.00	19.50	100.81	-	15.35	-	-	-	-	85.46
MW13-19	20.00	19.50	100.12	-	17.82	-	-	-	-	82.30

### Measurement Date: July 8, 2016

Well I.D.	Well Depth bsg	Well Depth btoc	Top of Casing Elevation	Depth To Product btoc	Depth To Water btoc	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW10-1	20.00	19.50	101.20	-	12.23	-	-	-	-	88.97
MW10-2	23.00	22.50	100.00	-	17.58	-	-	-	-	82.42
MW10-3	20.00	19.50	99.66	-	17.66	-	-	-	-	82.00
MW10-4	20.00	19.50	98.23	-	17.18	-	-	-	-	81.05
MW10-5	25.00	24.50	97.98	-	22.28	-	-	-	-	75.70
MW10-6	25.00	24.50	99.33	-	19.16	-	-	-	-	80.17
MW11-8	3.30	6.25	79.37	-	NM	-	-	-	-	NM
MW11-9	3.50	6.42	78.92	-	5.81	-	-	-	-	73.11
MW11-10	3.10	5.92	76.53	-	DRY	-	-	-	-	DRY
MW12-13	6.60	9.00	77.27	-	7.54	-	-	-	-	69.73
MW12-14	6.00	9.00	74.79	-	NM	-	-	-	-	NM
MW12-15	7.00	10.00	78.55	-	8.95	-	-	-	-	69.60
MW13-17	23.00	22.50	99.25	-	18.14	-	-	-	-	81.11
MW13-18	20.00	19.50	100.81	-	17.03	-	-	-	-	83.78

All Values Reported in Feet

bsg - Below Surface Grade

btoc - Below Top of Casing

NM - Not measured

Elevations determined relative to top of casing of MW10-2, which was arbitrarily set at 100'

Site surveyed by KAS, Inc. on June 30, 2010, April 11, 2011, January 10, 2013 and Sept. 26, 2013

Wells MW12-12 thru MW12-16 were surveyed by Button Professional Land Surveyors on July 16-17, 2014 and tied in to MW10-2.



# LIQUID LEVEL MONITORING DATA

Shelburne Road Variety  
So. Burlington, Vermont

## HISTORIC GROUNDWATER ELEVATIONS

Well I.D.	7/15/2010	12/22/2010	4/22/2011	12/1/2011	7/11/2012	1/22/2013	5/7/2015	10/21/2015*	12/8/2015	1/6/2016*	1/7/2016	3/30/2016	7/8/2016
MW10-1	88.90	89.50	89.81	89.33	88.98	89.69	89.43	NM	NM	89.54	89.57	NM	88.97
MW10-2	83.25	84.10	85.80	<b>83.50</b>	<b>82.88</b>	83.12	<b>82.17</b>	82.01	82.88	80.55	81.98	84.06	82.42
MW10-3	82.37	83.18	84.80	82.51	<b>81.95</b>	<b>82.12</b>	81.29	83.26	82.00	82.17	80.56	83.51	82.00
MW10-4	81.88	82.32	83.74	81.33	80.85	81.09	81.23	81.35	83.45	NM	NM	83.81	81.05
MW10-5	77.15	77.13	79.49	76.90	77.15	77.56	89.62	77.70	76.04	75.31	DRY	76.49	75.70
MW10-6	81.36	80.94	83.32	80.46	80.72	80.97	80.17	<b>77.81</b>	<b>78.08</b>	<b>77.97</b>	<b>79.28</b>	81.41	80.17
MW11-7	-	-	77.16	77.02	76.70	77.12	76.46	NM	NM	NM	NM	NM	NM
MW11-8	-	-	76.17	75.96	74.46	75.93	75.63	NM	NM	NM	75.59	NM	NM
MW11-9	-	-	75.47	75.18	74.14	75.12	74.58	NM	NM	NM	74.54	NM	73.11
MW11-10	-	-	72.78	72.32	69.84	71.81	71.33	NM	NM	NM	71.71	NM	DRY
MW11-11	-	-	73.61	73.31	71.70	73.22	73.14	NM	NM	NM	NM	NM	NM
MW12-12	-	-	-	-	59.81	63.07	63.28	NM	NM	NM	NM	NM	NM
MW12-13	-	-	-	-	70.77	71.97	70.56	NM	NM	NM	71.75	NM	69.73
MW12-14	-	-	-	-	69.22	69.57	70.00	67.20	NM	NM	69.71	70.25	NM
MW12-15	-	-	-	-	69.10	72.01	71.77	NM	NM	NM	71.86	NM	69.60
MW12-16	-	-	-	-	72.05	74.94	74.83	NM	NM	NM	NM	NM	NM
MW13-17	-	-	-	-	-	80.91	80.60	81.76	81.11	78.00	78.90	82.11	81.11
MW13-18	-	-	-	-	-	84.29	84.36	86.72	85.16	85.72	84.77	85.46	83.78
MW13-19	-	-	-	-	-	NM	81.28	82.41	81.64	81.72	81.73	82.30	NM

All Values Reported in Feet

NM - Not measured

Elevations determined relative to top of casing of MW10-2, which was arbitrarily set at 100'

Site surveyed by KAS, Inc. on June 30, 2010, April 11, 2011, January 10, 2013 and Sept. 26, 2013

Wells MW12-12 thru MW12-16 were surveyed by Button Professional Land Surveyors on July 16-17, 2014 and tied in to MW10-2.

**LNAPL detected**

\* Measurements taken during SVE/AS system operation



## **Appendix D**

### **Groundwater Quality Summary**



## Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont

**March 30, 2016 Groundwater Quality Summary Table**

Monitoring Well	MW10-2	MW10-3	MW10-4	MW10-5	MW10-6	MW12-14	MW13-17	MW13-18	VGES
PARAMETER	8021B	8021B	8021B	8021B	8021B	8021B	8021B	8021B	
Benzene	341	1,550	1.1	81.0	5,690	4,940	2,480	3,700	5
Toluene	512	8,100	ND(1.0)	175	7,320	15,600	13,800	20,700	1000
Ethylbenzene	281	1,490	ND(1.0)	53.5	2,380	1,090	2,520	2,080	700
Xylenes	1,800	7,500	ND(2.0)	438	10,700	5,680	12,900	11,900	10000
Total BTEX	2,934	18,640	1.1	748	26,540	27,310	31,700	38,380	-
MTBE	314	ND(200)	ND(2.0)	283	362	618	914	64.0	40
1,3,5-Trimethylbenzene	119	173	ND(1.0)	ND(50.0)	312	127	382	500	
1,2,4-Trimethylbenzene	405	686	ND(1.0)	77.5	1,280	450	1,330	1,230	350
Naphthalene	ND(100)	130	ND(2.0)	ND(100)	257	92.4	ND(400)	239	20
Total Targeted VOCs	3,772	19,629	1.1	1,108	28,751	28,597	34,326	40,413	-

PARAMETER	Surface Water	Low Wet Area	VWQS
Benzene			1.2
Toluene	Visual	Visual	6,800
Ethylbenzene	Inspection	Inspection	3,100
Xylenes	Only	Only	-
Total BTEX			-
MTBE	No	No	-
1,3,5-Trimethylbenzene	Odor or Sheen	Water	-
1,2,4-Trimethylbenzene	Observed	Observed	-
Naphthalene			-
Total Targeted VOCs			-

**July 8, 2016 Groundwater Quality Summary Table**

Monitoring Well	MW10-1	MW10-2	MW10-3	MW10-4	MW10-5	MW10-6	MW11-8	VGES
PARAMETER	8021B	8021B	8021B	8021B	8021B	8021B		
Benzene	ND(1.0)	372	109	2.1	44.4	4,560		5
Toluene	ND(1.0)	562	1,080	ND(1.0)	17.2	8,400	No	1000
Ethylbenzene	ND(1.0)	781	247	ND(1.0)	15.6	2,670	Sample	700
Xylenes	ND(2.0)	3,100	1,390	ND(2.0)	89.0	10,100		10000
Total BTEX	ND	4,815	2,826	2.1	166.2	25,730		-
MTBE	11.1	243	ND(40.0)	2.1	95.3	ND(200)	Well Unable	40
1,3,5-Trimethylbenzene	ND(1.0)	305	47.0	ND(1.0)	29.9	377	To Be Opened	
1,2,4-Trimethylbenzene	ND(1.0)	881	141	ND(1.0)	67.5	1,400		350
Naphthalene	ND(2.0)	ND(200)	ND(40.0)	ND(2.0)	6.2	259		20
Total Targeted VOCs	11.1	6,244	3,014	4.2	365.1	27,766		-

Monitoring Well	MW11-9	MW11-10	MW12-13	MW12-14	MW12-15	MW13-17	MW13-18	VGES
PARAMETER	8021B		8021B		8021B	8021B	8021B	
Benzene	730		1,930		2,540	1,500	401	5
Toluene	62.3	No	43.5	No	918	8,720	132	1000
Ethylbenzene	600	Sample	497	Sample	859	2,170	359	700
Xylenes	1,730		121		1,890	10,200	519	10000
Total BTEX	3,122		2,592		6,207	22,590	1,411	-
MTBE	359	Well	289	Unable to	465	756	24.1	40
1,3,5-Trimethylbenzene	136	Dry	ND(20.0)	locate/access	78.6	406	89.0	
1,2,4-Trimethylbenzene	554		87.8	due to	499	1,220	324	350
Naphthalene	126		23.2	thick brush	78.0	241	32.5	20
Total Targeted VOCs	4,297		2,992		7,328	25,213	1,881	-

PARAMETER	Surface Water	Low Wet Area	VWQS
Benzene			1.2
Toluene	Visual	Visual	6,800
Ethylbenzene	Inspection	Inspection	3,100
Xylenes	Only	Only	-
Total BTEX			-
MTBE	No	No	-
1,3,5-Trimethylbenzene	Odor or Sheen	Water	-
1,2,4-Trimethylbenzene	Observed	Observed	-
Naphthalene			-
Total Targeted VOCs			-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

VWQS - Vermont Water Quality Standards (January 1, 2008)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

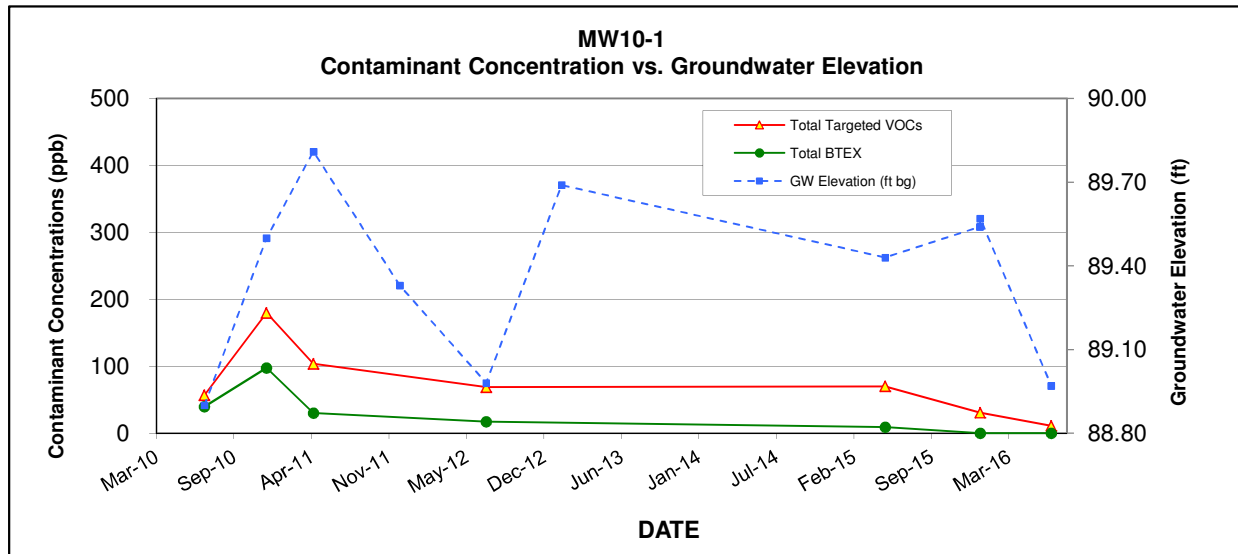
Shaded values meet or exceed VGES / VWQS

All samples collected while SVE/AS system was **not** in operation



## Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



### MW10-1

PARAMETER	Sample Date Method	7/15/2010 8260B	12/22/2010 8021B	4/22/2011 8021B	12/1/2011	7/11/2012 8021B	1/22/2013	5/7/2015 8021B	VGES
Benzene		<b>39.8</b>	<b>79.8</b>	<b>30.3</b>		<b>17.4</b>		<b>9.1</b>	5
Toluene		ND<5.0	<b>3.2</b>	ND<1.0	Well	ND<1.0	Well	ND<5.0	1000
Ethylbenzene		ND<5.0	<b>2.3</b>	ND<1.0	Not	ND<1.0	Not	ND<5.0	700
Xylenes		ND<10.0	<b>12.4</b>	ND<2.0	Sampled	ND<2.0	Sampled	ND<10.0	10000
Total BTEX		<b>39.8</b>	<b>97.7</b>	<b>30.3</b>		<b>17.4</b>		<b>9.1</b>	-
MTBE		<b>17.1</b>	<b>78.1</b>	<b>73.5</b>		<b>51.5</b>		<b>61.0</b>	40
1,3,5-Trimethylbenzene		ND<5.0	ND<1.0	ND<1.0		ND<1.0		ND<5.0	
1,2,4-Trimethylbenzene		ND<5.0	<b>4.0</b>	ND<1.0		ND<1.0		ND<5.0	350
Naphthalene		ND<10.0	ND<2.0	ND<2.0		ND<2.0		ND<10.0	20
Total Targeted VOCs		<b>56.9</b>	<b>179.8</b>	<b>103.8</b>		<b>68.9</b>		<b>70.1</b>	-
GW Elevation (ft bg)		88.90	89.50	89.81	89.33	88.98	89.69	89.43	-

PARAMETER	Sample Date Method	1/6/2016 *SVE/AS on	1/7/2016 8021B	7/8/2016 8021B					VGES
Benzene			ND(1.0)	ND(1.0)					5
Toluene		No	ND(1.0)	ND(1.0)					1000
Ethylbenzene		Sample	ND(1.0)	ND(1.0)					700
Xylenes			ND(2.0)	ND(2.0)					10000
Total BTEX			ND	ND					-
MTBE			<b>30.8</b>	<b>11.1</b>					40
1,3,5-Trimethylbenzene		Gauge	ND(1.0)	ND(1.0)					
1,2,4-Trimethylbenzene		Only	ND(1.0)	ND(1.0)					350
Naphthalene			ND(2.0)	ND(2.0)					20
Total Targeted VOCs			<b>30.8</b>	<b>11.1</b>					-
GW Elevation (ft bg)		89.54	89.57	88.97					-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

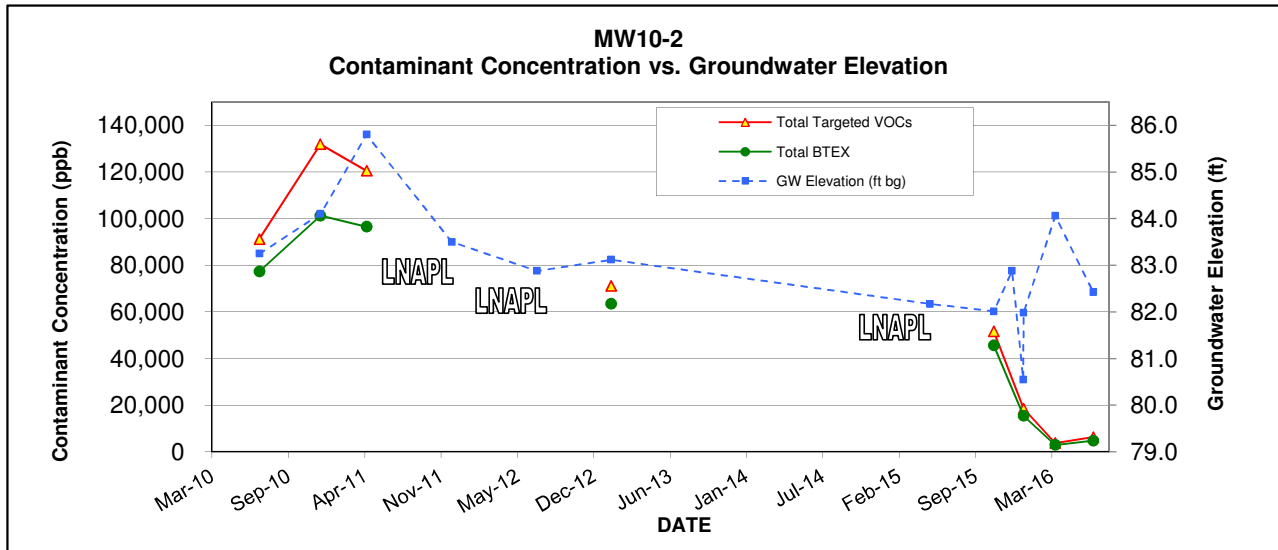
Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



## Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



### MW10-2

Sample Date Method	7/15/2010 8260B	12/22/2010 8021B	4/22/2011 8021B	12/1/2011	7/11/2012	1/22/2013 8021B	5/7/2015	VGES
PARAMETER								
Benzene	9,920	18,900	13,400			7,520		5
Toluene	45,300	51,700	53,500	Well	Well	32,300	Well	1000
Ethylbenzene	3,420	4,550	4,710	Not	Not	3,790	Not	700
Xylenes	18,700	26,100	24,900	Sampled	Sampled	19,900	Sampled	10000
Total BTEX	77,340	101,250	96,510			63,510		-
MTBE	9,330	27,100	20,000	LNAPL	LNAPL	6,020	LNAPL	40
1,3,5-Trimethylbenzene	505	734	889	Present	Present	ND<1,000	Present	
1,2,4-Trimethylbenzene	1,750	2,830	3,110	(0.01 ft)	(thin layer)	1,680	(0.02 ft)	350
Naphthalene	ND<1,000	ND<400	ND<1,000			ND<2,000		20
Total Targeted VOCs	91,265	131,914	120,509			71,210		-
GW Elevation (ft bg)	83.25	84.10	85.80	83.50	82.88	83.12	82.17	-

Sample Date Method	10/21/2015 8021B *SVE/AS on	12/8/2015	1/6/2016 *SVE/AS on	1/7/2016 8021B	3/30/2016 8021B	7/8/2016 8021B	VGES
PARAMETER							
Benzene	1,400			406	341	372	5
Toluene	17,600	No	No	4,310	512	562	1000
Ethylbenzene	3,680	Sample	Sample	1,560	281	781	700
Xylenes	22,900			9,130	1,800	3,100	10000
Total BTEX	45,580			15,406	2,934	4,815	-
MTBE	ND(400)			ND(400)	314	243	40
1,3,5-Trimethylbenzene	1,290	Gauge	Gauge	739	119	305	
1,2,4-Trimethylbenzene	4,210	Only	Only	2,080	405	881	350
Naphthalene	550			282	ND(100)	ND(200)	20
Total Targeted VOCs	51,630			18,507	3,772	6,244	-
GW Elevation (ft bg)	82.01	82.88	80.55	81.98	84.06	82.42	-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

Shaded values meet or exceed VGES

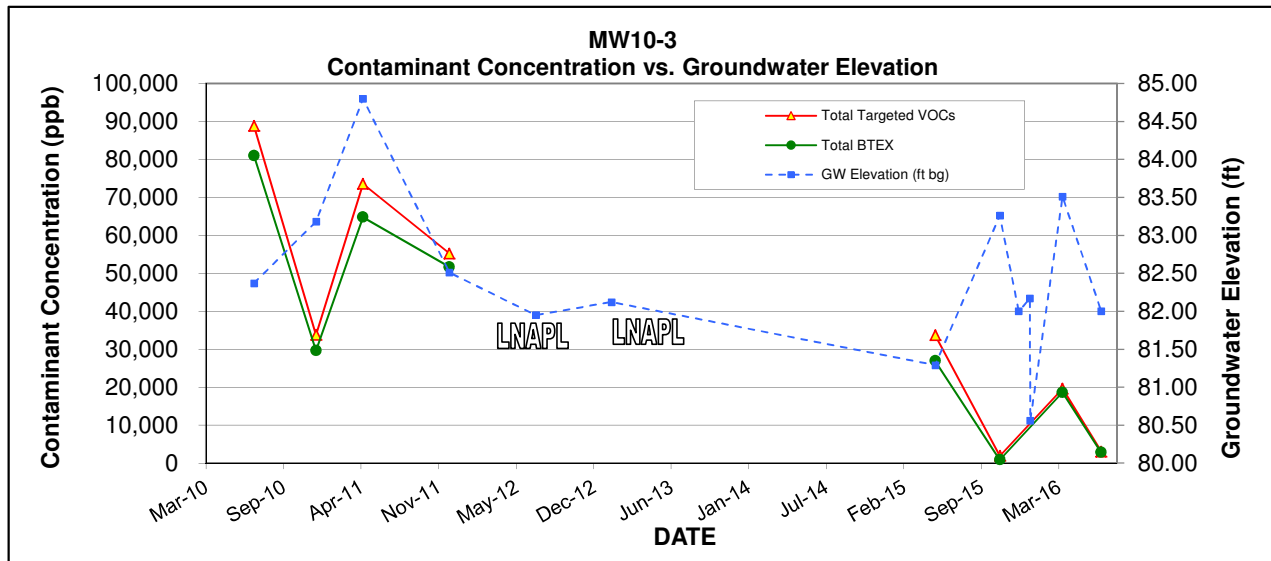
\* Sampling or gauging occurred while SVE/AS remedial system in operation





## Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



### MW10-3

PARAMETER	Sample Date Method	7/15/2010 8260B	12/22/2010 8021B	4/22/2011 8021B	12/1/2011 8021B	7/11/2012	1/22/2013	5/7/2015 8021B	VGES
Benzene		12,600	4,860	9,600	6,100			2,260	5
Toluene		46,500	11,200	28,500	25,600	Well	Well	6,210	1000
Ethylbenzene		3,640	2,290	4,690	3,480	Not	Not	3,190	700
Xylenes		18,300	11,300	22,000	16,500	Sampled	Sampled	15,300	10000
Total BTEX		81,040	29,650	64,790	51,680			26,960	-
MTBE		4,120	885	3,060	743	LNAPL	LNAPL	ND<400	40
1,3,5-Trimethylbenzene		520	685	1,310	617	Present	Present	1,540	
1,2,4-Trimethylbenzene		1,980	2,570	4,410	2,180	(thin layer)	(0.01 ft)	4,700	350
Naphthalene		ND<1,000	ND<400	ND<1,000	ND<400			477	20
Total Targeted VOCs		88,850	33,790	73,570	55,220			33,677	-
GW Elevation (ft bg)		82.37	83.18	84.80	82.51	81.95	82.12	81.29	-

PARAMETER	Sample Date Method	10/21/2015 8021B *SVE/AS on	12/8/2015	1/6/2016 *SVE/AS on	1/7/2016 8021B	3/30/2016 8021B	7/8/2016 8021B	VGES
Benzene		ND(20.0)				1,550	109	5
Toluene		49.7	No	No	No	8,100	1,080	1000
Ethylbenzene		ND(20.0)	Sample	Sample	Sample	1,490	247	700
Xylenes		842				7,500	1,390	10000
Total BTEX		892				18,640	2,826	-
MTBE		68.4			Insufficient	ND(200)	ND(40.0)	40
1,3,5-Trimethylbenzene		636	Gauge	Gauge	Amount	173	47.0	
1,2,4-Trimethylbenzene		305	Only	Only	of Water	686	141	350
Naphthalene		ND(40.0)				130	ND(40.0)	20
Total Targeted VOCs		1,901				19,629	3,014	-
GW Elevation (ft bg)		83.26	82.00	82.17	80.56	83.51	82.00	-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

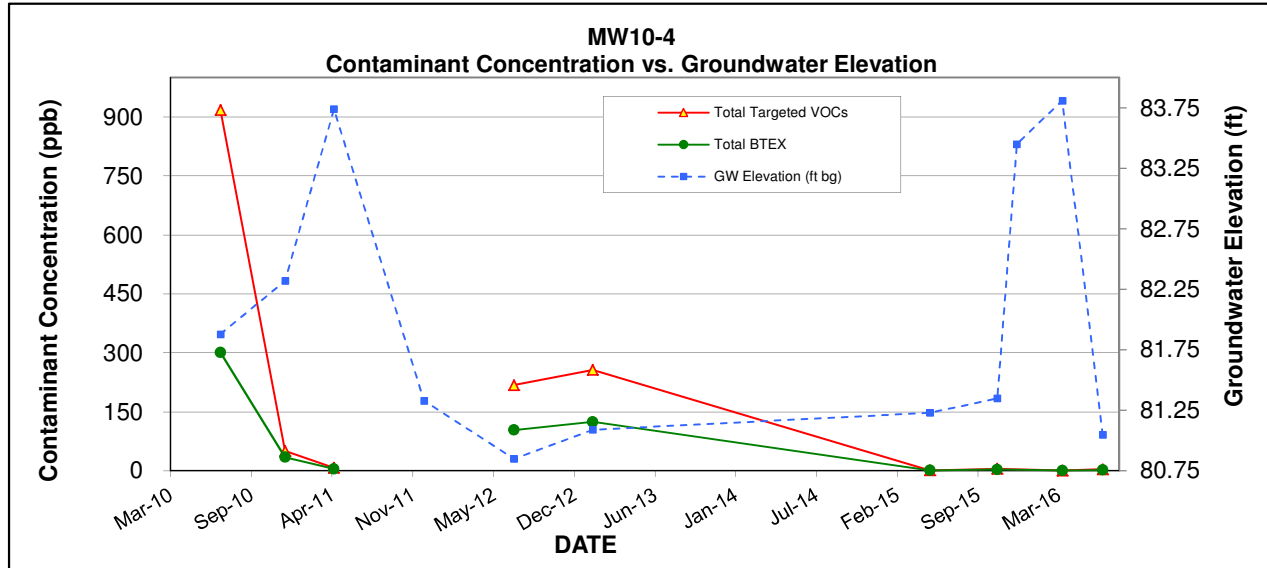
Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



## Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



### MW10-4

Sample Date Method	7/15/2010 8260B	12/22/2010 8021B	4/22/2011 8021B	12/1/2011	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	VGES
PARAMETER								
Benzene	<b>261</b>	<b>22.5</b>	<b>3.0</b>		<b>85.1</b>	<b>103</b>	<b>1.6</b>	5
Toluene	<b>40.3</b>	<b>12.1</b>	<b>1.9</b>	Well	<b>15.5</b>	<b>16.5</b>	ND<1.0	1000
Ethylbenzene	ND<5.0	ND<1.0	ND<1.0	Not	ND<1.0	<b>1.2</b>	ND<1.0	700
Xylenes	ND<10.0	ND<2.0	ND<2.0	Sampled	<b>3.5</b>	<b>4.1</b>	ND<2.0	10000
Total BTEX	<b>301</b>	<b>34.6</b>	<b>4.9</b>		<b>104.1</b>	<b>125</b>	<b>1.6</b>	-
MTBE	<b>475</b>	<b>14.8</b>	<b>3.2</b>		<b>114</b>	<b>132</b>	ND<2.0	40
1,3,5-Trimethylbenzene	ND<5.0	ND<1.0	ND<1.0		ND<1.0	ND<1.0	ND<1.0	
1,2,4-Trimethylbenzene	ND<5.0	<b>1.2</b>	ND<1.0		ND<1.0	ND<1.0	ND<1.0	350
Naphthalene	ND<10.0	ND<2.0	ND<2.0		ND<2.0	ND<2.0	ND<2.0	20
Total Targeted VOCs	<b>918</b>	<b>50.6</b>	<b>8.1</b>		<b>218</b>	<b>257</b>	<b>1.6</b>	-
GW Elevation (ft bg)	81.88	82.32	83.74	81.33	80.85	81.09	81.23	-

Sample Date Method	10/21/2015 8021B *SVE/AS on	12/8/2015	1/6/2016 *SVE/AS on	1/7/2016 8021B	3/30/2016 8021B	7/8/2016 8021B	VGES
PARAMETER							
Benzene	<b>3.3</b>				<b>1.1</b>	<b>2.1</b>	5
Toluene	ND(1.0)	No	No	No	ND(1.0)	ND(1.0)	1000
Ethylbenzene	ND(1.0)	Sample	Gauge	Sample	ND(1.0)	ND(1.0)	700
Xylenes	ND(2.0)				ND(2.0)	ND(2.0)	10000
Total BTEX	<b>3.3</b>				<b>1.1</b>	<b>2.1</b>	-
MTBE	<b>2.1</b>		Well	Well	ND(2.0)	<b>2.1</b>	40
1,3,5-Trimethylbenzene	ND(1.0)	Gauge	Obstructed	Obstructed	ND(1.0)	ND(1.0)	
1,2,4-Trimethylbenzene	ND(1.0)	Only	by Snow Pile	by Snow Pile	ND(1.0)	ND(1.0)	350
Naphthalene	ND(2.0)				ND(2.0)	ND(2.0)	20
Total Targeted VOCs	<b>5.4</b>				<b>1.1</b>	<b>4.2</b>	-
GW Elevation (ft bg)	81.35	83.45			83.81	81.05	-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

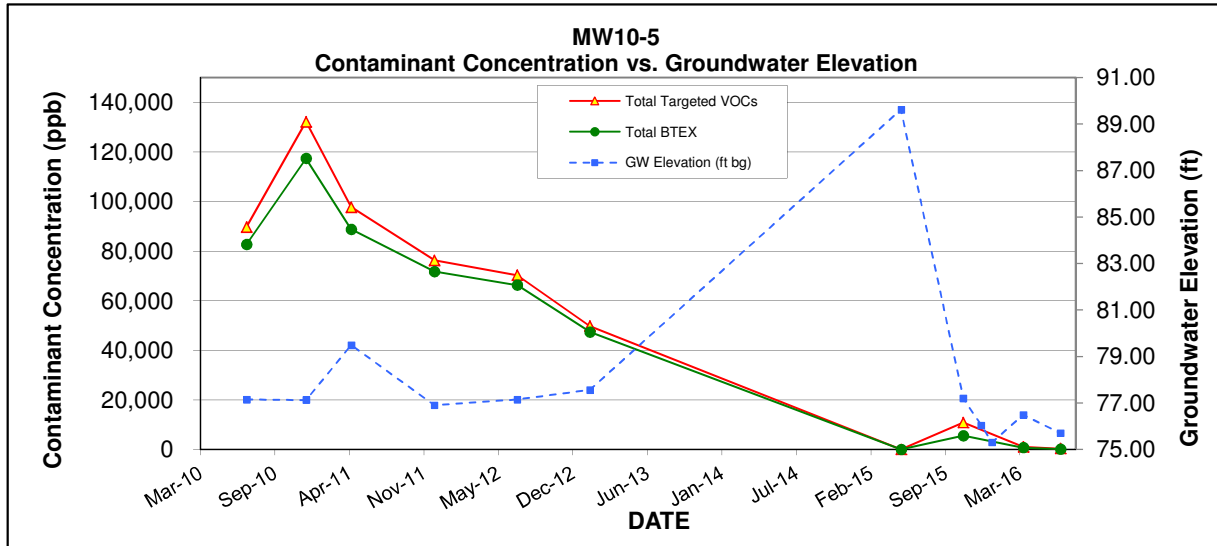
Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



## Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



### MW10-5

PARAMETER	Sample Date Method	7/15/2010 8260B	12/22/2010 8021B	4/22/2011 8021B	12/1/2011 8021B	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	VGES
Benzene		13,900	21,100	14,600	12,800	10,100	7,290	ND<1.0	5
Toluene		47,300	58,100	47,800	41,800	37,000	26,500	ND<1.0	1000
Ethylbenzene		3,580	6,470	4,370	2,980	3,400	2,320	ND<1.0	700
Xylenes		18,000	31,700	22,000	14,200	15,800	11,300	ND<2.0	10000
Total BTEX		82,780	117,370	88,770	71,780	66,300	47,410	ND	-
MTBE		4,500	4,690	4,520	2,880	1,600	1,370	ND<2.0	40
1,3,5-Trimethylbenzene		555	2,420	1,010	ND<1,000	555	ND<500	ND<1.0	
1,2,4-Trimethylbenzene		1,890	7,660	3,400	1,590	1,840	1,000	ND<1.0	350
Naphthalene		ND<1,000	ND<1,000	ND<1,000	ND<2,000	ND<1,000	ND<1,000	ND<2.0	20
Total Targeted VOCs		89,725	132,140	97,700	76,250	70,295	49,780	ND	-
GW Elevation (ft bg)		77.15	77.13	79.49	76.90	77.15	77.56	89.62	-

PARAMETER	Sample Date Method	10/21/2015 8021B	12/8/2015	1/6/2016	1/7/2016 8021B	3/30/2016 8021B	7/8/2016 8021B	VGES
Benzene		ND(50.0)		*SVE/AS on		81.0	44.4	5
Toluene		164	No	No	No	175	17.2	1000
Ethylbenzene		63.8	Sample	Sample	Sample	53.5	15.6	700
Xylenes		5,360				438	89.0	10000
Total BTEX		5,588				748	166.2	-
MTBE		101				283	95.3	40
1,3,5-Trimethylbenzene		1,560	Gauge	Gauge	Well	ND(50.0)	29.9	
1,2,4-Trimethylbenzene		2,970	Only	Only	Dry	77.5	67.5	350
Naphthalene		673				ND(100)	6.2	20
Total Targeted VOCs		10,892				1,108	365.1	-
GW Elevation (ft bg)		77.20	76.04	75.31		76.49	75.70	-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

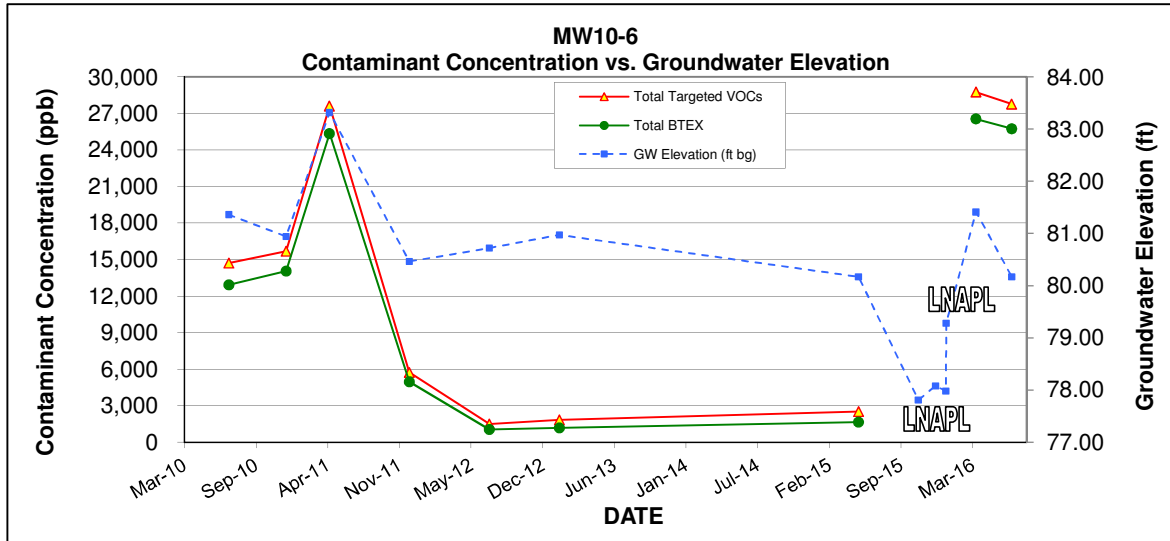
Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



## Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



### MW10-6

Sample Date Method	7/15/2010 8260B	12/22/2010 8021B	4/22/2011 8021B	12/1/2011 8021B	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	VGES
PARAMETER								
Benzene	1,470	2,060	3,810	1,360	253	291	172	5
Toluene	6,500	7,600	13,900	1,700	426	378	239	1000
Ethylbenzene	873	876	1,450	434	65.3	121	297	700
Xylenes	4,080	3,520	6,190	1,460	304	377	939	10000
Total BTEX	12,923	14,056	25,350	4,954	1,048	1,167	1,647	-
MTBE	231	273	495	147	ND<100	107	ND<400	40
1,3,5-Trimethylbenzene	274	268	332	109	58.5	82.6	277	
1,2,4-Trimethylbenzene	1,020	888	1,190	390	219	261	604	350
Naphthalene	141	189	238	128	169	214	ND<400	20
Total Targeted VOCs	14,704	15,674	27,605	5,728	1,495	1,832	2,528	-
GW Elevation (ft bg)	81.36	80.94	83.32	80.46	80.72	80.97	80.17	-

Sample Date Method	10/21/2015 8021B	12/8/2015	1/6/2016	1/7/2016 8021B	3/30/2016 8021B	7/8/2016 8021B	VGES
PARAMETER							
Benzene	*SVE/AS on		*SVE/AS on		5,690	4,560	5
Toluene	Well	No Sample	No Sample	Well	7,320	8,400	1000
Ethylbenzene	Not	Gauge	Gauge	Not	2,830	2,670	700
Xylenes	Sampled	Only	Only	Sampled	10,700	10,100	10000
Total BTEX					26,540	25,730	-
MTBE	LNAPL	LNAPL	LNAPL	LNAPL	362	ND(200)	40
1,3,5-Trimethylbenzene	Present	Present	Present	Present	312	377	
1,2,4-Trimethylbenzene	(0.1 ft)	(<2mm)	(0.02 ft)	(0.01 ft)	1,280	1,400	350
Naphthalene					257	259	20
Total Targeted VOCs					28,751	27,766	-
GW Elevation (ft bg)	77.81	78.08	77.98	79.28	81.41	80.17	-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

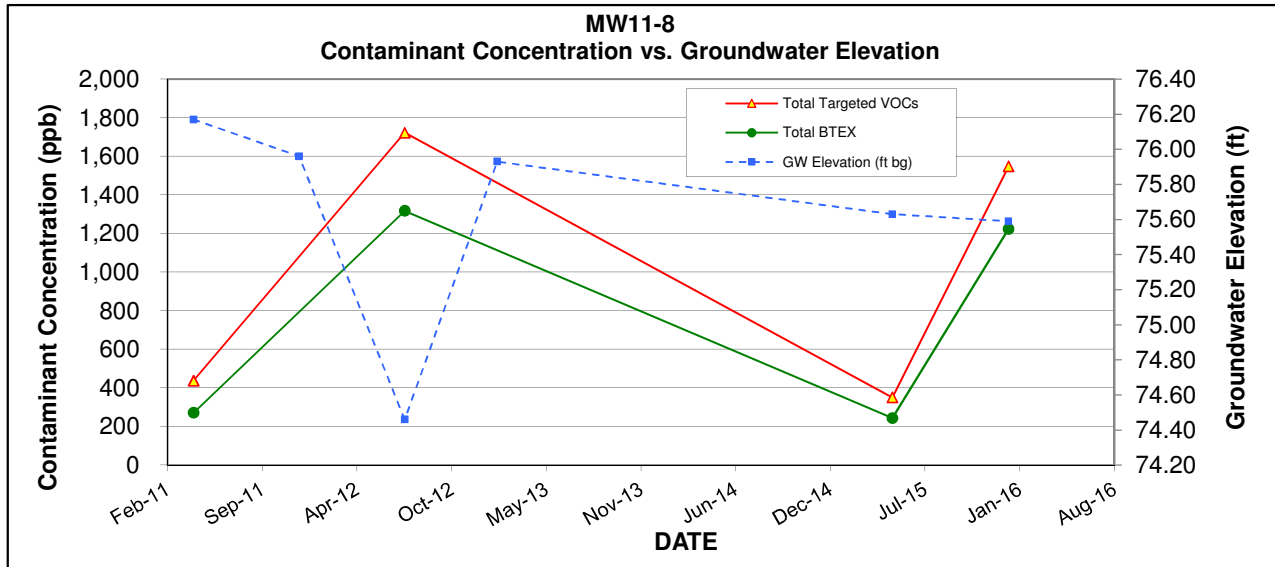
Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



# Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



## MW11-8

PARAMETER	Sample Date Method	4/22/2011 8021B	12/1/2011	7/11/2012 8021B	1/22/2013	5/7/2015 8021B	1/7/2016 8021B	7/8/2016	VGES
Benzene		<b>139</b>		<b>427</b>		<b>77.6</b>	<b>148</b>		5
Toluene		<b>19.3</b>	Well	<b>39.3</b>	Well	<b>7.8</b>	<b>16.9</b>	No	1000
Ethylbenzene		<b>11.9</b>	Not	<b>245</b>	Not	<b>11.6</b>	<b>255</b>	Sample	700
Xylenes		<b>101</b>	Sampled	<b>606</b>	Sampled	<b>147</b>	<b>804</b>		10000
Total BTEX		<b>271.2</b>		<b>1,317</b>		<b>244.0</b>	<b>1,224</b>		-
MTBE		<b>71.0</b>		<b>274</b>		<b>29.7</b>	<b>127</b>	Well Unable	40
1,3,5-Trimethylbenzene		<b>25.7</b>		<b>15.2</b>		<b>12.0</b>	<b>26.8</b>	To Be Opened	
1,2,4-Trimethylbenzene		<b>53.3</b>		<b>99.0</b>		<b>65.0</b>	<b>155</b>		350
Naphthalene		<b>16.4</b>		<b>17.7</b>		ND<10.0	<b>15.3</b>		20
Total Targeted VOCs		<b>437.6</b>		<b>1,723</b>		<b>350.7</b>	<b>1,548</b>		-
GW Elevation (ft bg)		76.17	75.96	74.46	75.93	75.63	75.59		-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

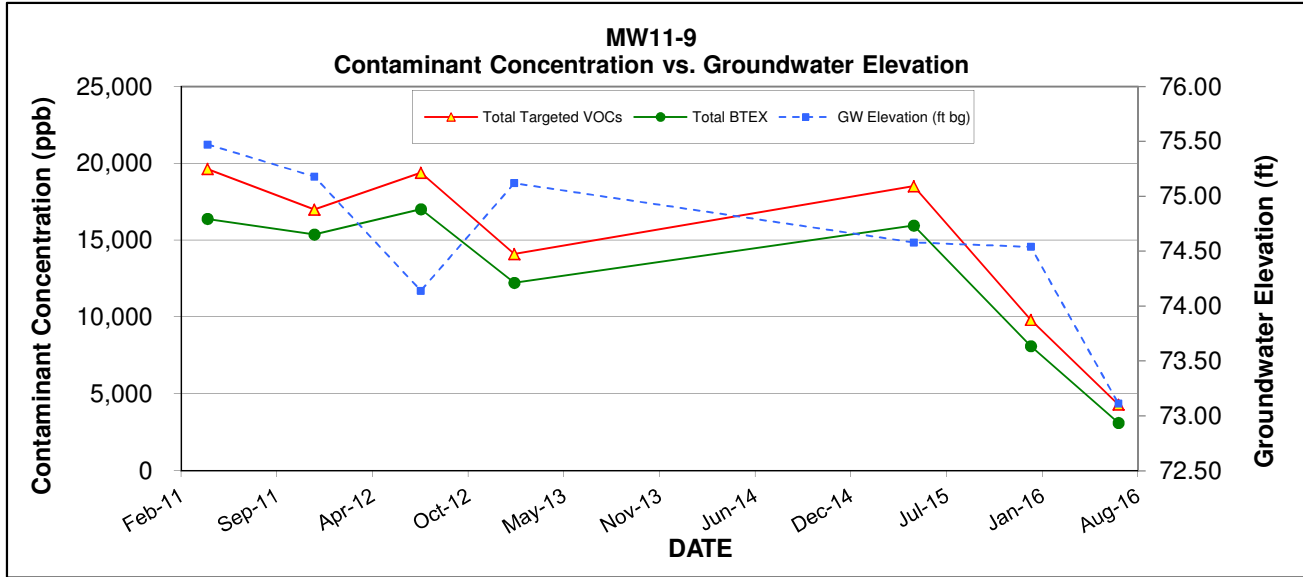
**Bold** font indicates a detected concentration.

Shaded values meet or exceed VGES



# Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



## MW11-9

PARAMETER	Sample Date Method	4/22/2011 8021B	12/1/2011 8021B	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	1/7/2016 8021B	7/8/2016 8021B	VGES
Benzene		<b>7,160</b>	<b>7,470</b>	<b>7,110</b>	<b>4,860</b>	<b>4,190</b>	<b>2,120</b>	<b>730</b>	5
Toluene		<b>1,850</b>	<b>579</b>	<b>1,070</b>	<b>1,020</b>	<b>1,970</b>	<b>128</b>	<b>62.3</b>	1000
Ethylbenzene		<b>1,550</b>	<b>1,590</b>	<b>2,020</b>	<b>1,400</b>	<b>2,350</b>	<b>1,460</b>	<b>600</b>	700
Xylenes		<b>5,820</b>	<b>5,740</b>	<b>6,820</b>	<b>4,940</b>	<b>7,440</b>	<b>4,400</b>	<b>1,730</b>	10000
Total BTEX		<b>16,380</b>	<b>15,379</b>	<b>17,020</b>	<b>12,220</b>	<b>15,950</b>	<b>8,108</b>	<b>3,122</b>	-
MTBE		<b>2,020</b>	<b>535</b>	<b>1,140</b>	<b>1,010</b>	<b>651</b>	<b>439</b>	<b>359</b>	40
1,3,5-Trimethylbenzene		<b>209</b>	<b>185</b>	<b>203</b>	<b>202</b>	<b>388</b>	<b>227</b>	<b>136</b>	-
1,2,4-Trimethylbenzene		<b>818</b>	<b>769</b>	<b>784</b>	<b>669</b>	<b>1,300</b>	<b>870</b>	<b>554</b>	350
Naphthalene		<b>198</b>	<b>120</b>	<b>245</b>	ND<200	<b>231</b>	<b>162</b>	<b>126</b>	20
Total Targeted VOCs		<b>19,625</b>	<b>16,988</b>	<b>19,392</b>	<b>14,101</b>	<b>18,520</b>	<b>9,806</b>	<b>4,297</b>	-
GW Elevation (ft bg)		75.47	75.18	74.14	75.12	74.58	74.54	73.11	-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

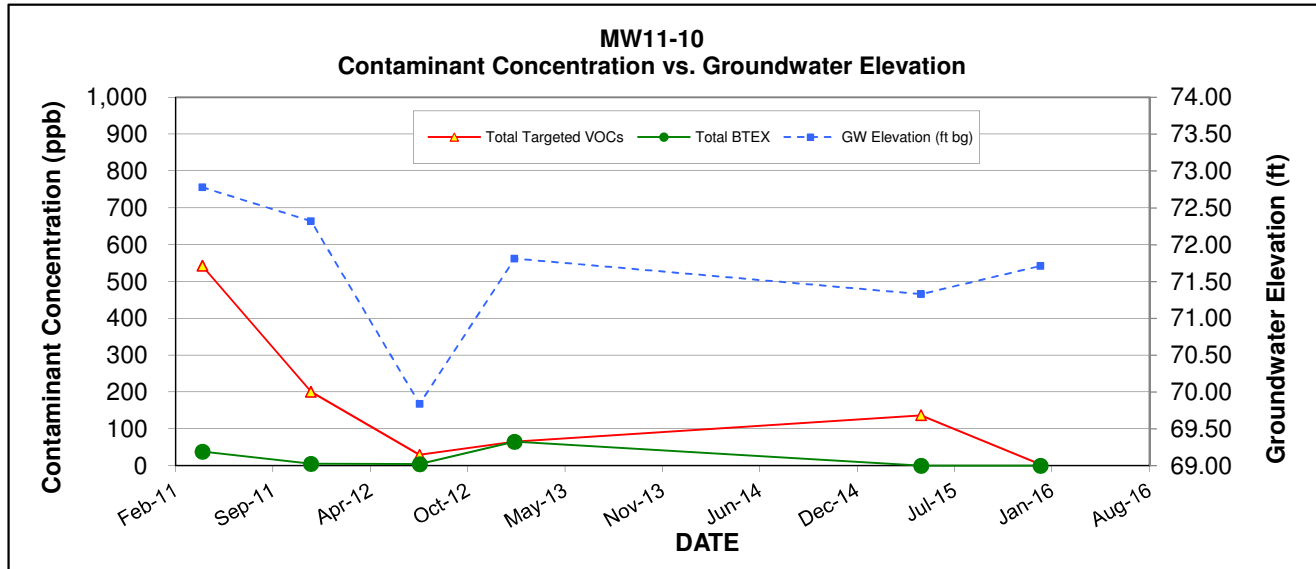
**Bold** font indicates a detected concentration.

Shaded values meet or exceed VGES



# Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



## MW11-10

PARAMETER	Sample Date Method	4/22/2011 8021B	12/1/2011 8021B	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	1/7/2016 8021B	7/8/2016	VGES
Benzene		<b>38.7</b>	<b>5.6</b>	<b>4.4</b>	<b>65.2</b>	ND<1.0	ND(1.0)		5
Toluene		ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND(1.0)	No	1000
Ethylbenzene		ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND(1.0)	Sample	700
Xylenes		ND<2.0	ND<4.0	ND<2.0	ND<2.0	ND<2.0	ND(2.0)		10000
Total BTEX		<b>38.7</b>	<b>5.6</b>	<b>4.4</b>	<b>65.2</b>	ND	ND		-
MTBE		<b>504</b>	<b>195</b>	<b>25.1</b>	ND<2.0	<b>137</b>	<b>3.7</b>		40
1,3,5-Trimethylbenzene		ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND(1.0)	Well	
1,2,4-Trimethylbenzene		ND<1.0	ND<2.0	ND<1.0	ND<1.0	ND<1.0	ND(1.0)	Dry	350
Naphthalene		ND<2.0	ND<4.0	ND<2.0	ND<2.0	ND<2.0	ND(2.0)		20
Total Targeted VOCs		<b>543</b>	<b>201</b>	<b>29.5</b>	<b>65.2</b>	<b>137</b>	<b>3.7</b>		-
GW Elevation (ft bg)		72.78	72.32	69.84	71.81	71.33	71.71		-

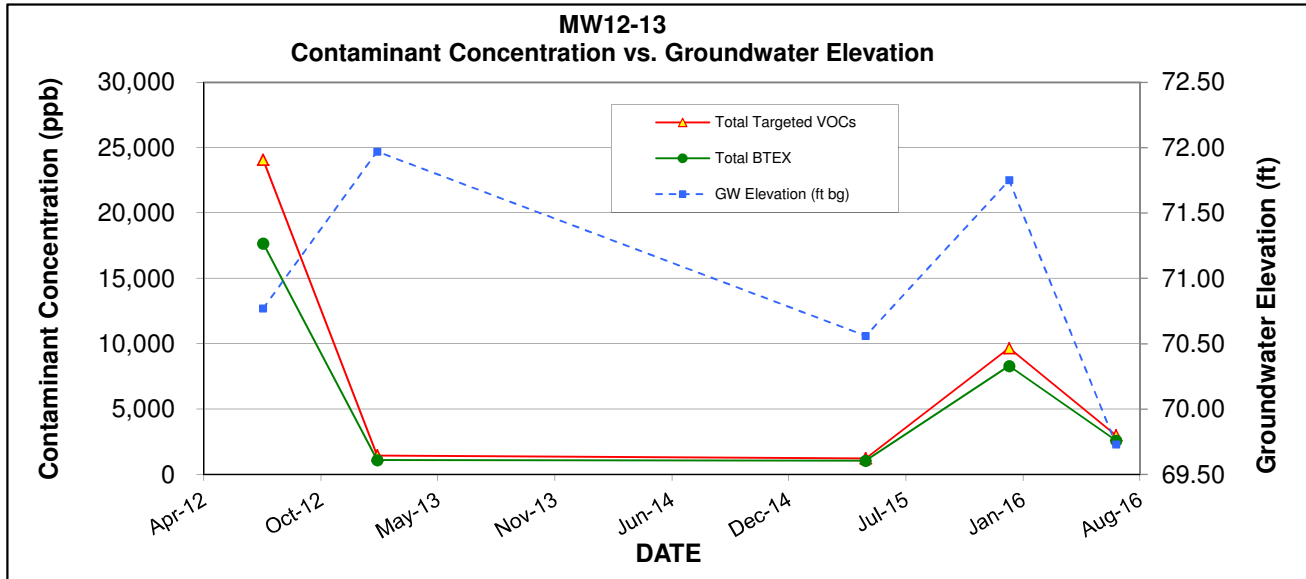
All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

Shaded values meet or exceed VGES



MW12-13

PARAMETER	Sample Date Method	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	1/7/2016 8021B	7/8/2016 8021B		VGES
Benzene		9,550	832	807	3,200	1,930		5
Toluene		957	27.2	28.9	261	43.5		1000
Ethylbenzene		1,380	87.6	139	1,190	497		700
Xylenes		5,790	150	72.3	3,650	121		10000
Total BTEX		17,677	1,097	1,047	8,301	2,592		-
MTBE		5,330	335	128	523	289		40
1,3,5-Trimethylbenzene		ND<100	ND<10.0	4.6	120	ND(20.0)		
1,2,4-Trimethylbenzene		845	21.9	42.2	606	87.8		350
Naphthalene		219	ND<20.0	8.8	116	23.2		20
Total Targeted VOCs		24,071	1,454	1,231	9,666	2,992		-
GW Elevation (ft bg)		70.77	71.97	70.56	71.75	69.73		-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

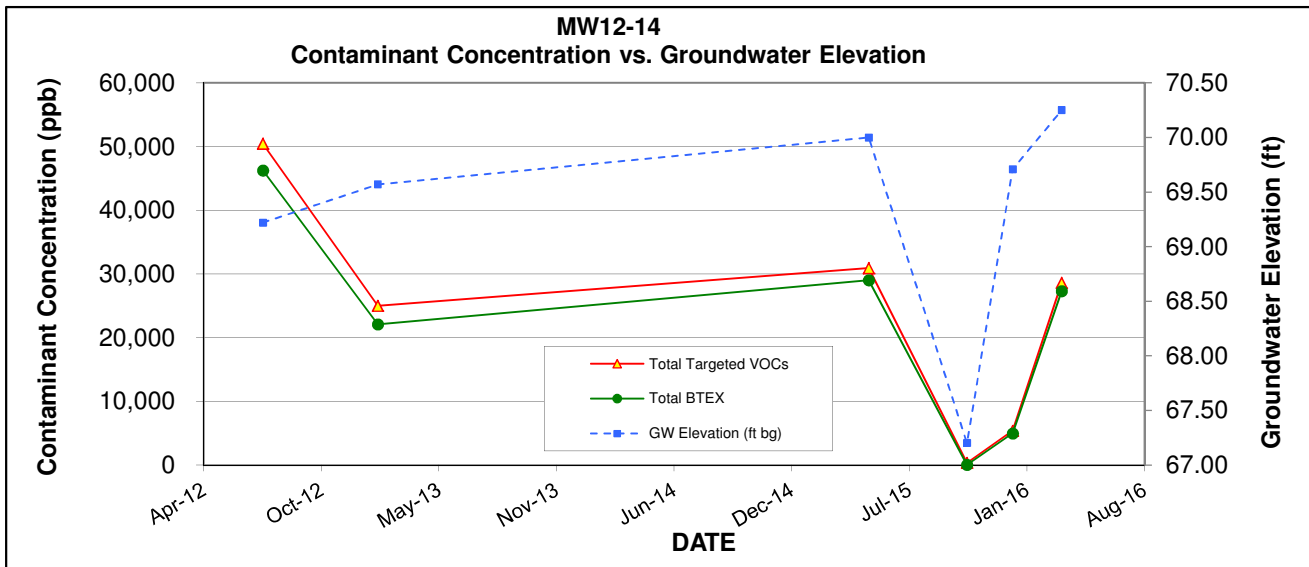
Shaded values meet or exceed VGES





# Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont



## MW12-14

PARAMETER	Sample Date Method	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	10/21/2015 8021B *SVE/AS on	1/7/2016 8021B	3/30/2016 8021B	7/8/2016	VGES
Benzene		<b>10,100</b>	<b>4,970</b>	<b>6,640</b>	<b>13.4</b>	<b>1,350</b>	<b>4,940</b>		5
Toluene		<b>24,400</b>	<b>10,400</b>	<b>14,300</b>	ND(5.0)	<b>2,010</b>	<b>15,600</b>	No	1000
Ethylbenzene		<b>1,330</b>	<b>249</b>	<b>1,150</b>	ND(5.0)	<b>280</b>	<b>1,090</b>	Sample	700
Xylenes		<b>10,400</b>	<b>6,470</b>	<b>6,920</b>	<b>12.9</b>	<b>1,340</b>	<b>5,680</b>		10000
Total BTEX		<b>46,230</b>	<b>22,089</b>	<b>29,010</b>	<b>26.3</b>	<b>4,980</b>	<b>27,310</b>		-
MTBE		<b>2,520</b>	<b>1,670</b>	<b>988</b>	<b>313</b>	<b>229</b>	<b>618</b>	Unable to	40
1,3,5-Trimethylbenzene		<b>472</b>	<b>433</b>	<b>266</b>	ND(5.0)	ND(50.0)	<b>127</b>	locate/access	
1,2,4-Trimethylbenzene		<b>1,220</b>	<b>790</b>	<b>661</b>	<b>6.1</b>	<b>174</b>	<b>450</b>	due to	350
Naphthalene		ND<400	ND<400	ND<100	ND(10.0)	ND<100	<b>92.4</b>	thick brush	20
Total Targeted VOCs		<b>50,442</b>	<b>24,982</b>	<b>30,925</b>	<b>345</b>	<b>5,383</b>	<b>28,597</b>		-
GW Elevation (ft bg)		69.22	69.57	70.00	67.20	69.71	70.25		-

All Values Reported in ug/L (ppb)

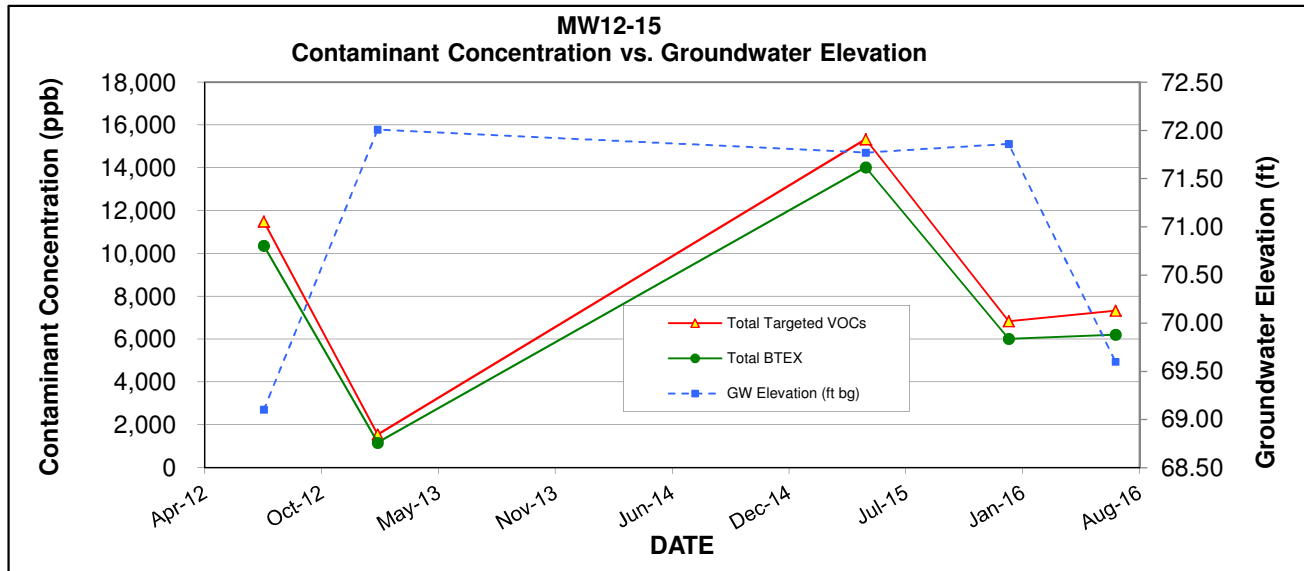
VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



MW12-15

PARAMETER	Sample Date Method	7/11/2012 8021B	1/22/2013 8021B	5/7/2015 8021B	1/7/2016 8021B	7/8/2016 8021B		VGES
Benzene		<b>2,620</b>	<b>654</b>	<b>4,300</b>	<b>1,510</b>	<b>2,540</b>		5
Toluene		<b>2,920</b>	<b>12.5</b>	<b>4,640</b>	<b>1,930</b>	<b>918</b>		1000
Ethylbenzene		<b>712</b>	<b>142</b>	<b>1,050</b>	<b>516</b>	<b>859</b>		700
Xylenes		<b>4,110</b>	<b>362</b>	<b>4,040</b>	<b>2,070</b>	<b>1,890</b>		10000
Total BTEX		<b>10,362</b>	<b>1,171</b>	<b>14,030</b>	<b>6,026</b>	<b>6,207</b>		-
MTBE		<b>485</b>	<b>278</b>	<b>545</b>	<b>320</b>	<b>465</b>		40
1,3,5-Trimethylbenzene		<b>149</b>	<b>37.6</b>	<b>170</b>	<b>89.9</b>	<b>78.6</b>		
1,2,4-Trimethylbenzene		<b>507</b>	<b>61.7</b>	<b>601</b>	<b>342</b>	<b>499</b>		350
Naphthalene		ND<100	ND<20.0	ND<100	<b>65.0</b>	<b>78.0</b>		20
Total Targeted VOCs		<b>11,503</b>	<b>1,548</b>	<b>15,346</b>	<b>6,843</b>	<b>7,328</b>		-
GW Elevation (ft bg)		69.10	72.01	71.77	71.86	69.60		-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

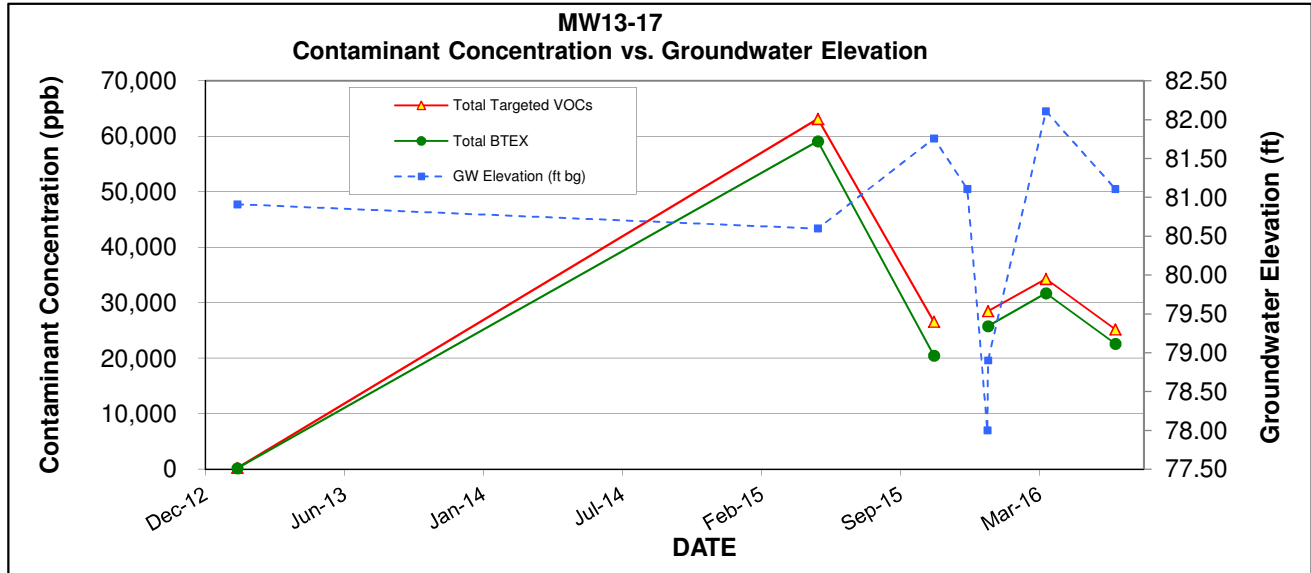
**Bold font indicates a detected concentration.**

**Shaded values meet or exceed VGES**



# Groundwater Quality Summary

Shelburne Road Variety  
South Burlington, VT



## MW13-17

PARAMETER	Sample Date Method	1/22/2013 8021B	5/7/2015 8021B	10/21/2015 8021B *SVE/AS on	12/8/2015	1/6/2016 *SVE/AS on	1/7/2016 8021B	3/30/2016 8021B	VGES
Benzene		47.9	5,130	493			1,970	2,480	5
Toluene		87.2	33,200	3,630	No	No	12,000	13,800	1000
Ethylbenzene		6.3	3,690	587	Sample	Sample	1,940	2,520	700
Xylenes		25.9	17,100	15,800			9,890	12,900	10000
Total BTEX		167.3	59,120	20,510			25,800	31,700	-
MTBE		78.9	1,330	387			895	914	40
1,3,5-Trimethylbenzene		ND<2.0	622	1,380	Gauge	Gauge	481	382	
1,2,4-Trimethylbenzene		ND<2.0	2,060	3,860	Only	Only	1,070	1,330	350
Naphthalene		ND<4.0	ND<400	428			260	ND(400)	20
Total Targeted VOCs		246.2	63,132	26,565			28,506	34,326	-
GW Elevation (ft bg)		80.91	80.60	81.76	81.11	78.00	78.90	82.11	-

PARAMETER	Sample Date Method	7/8/2016 8021B							VGES
Benzene		1,500							5
Toluene		8,720							1000
Ethylbenzene		2,170							700
Xylenes		10,200							10000
Total BTEX		22,590							-
MTBE		756							40
1,3,5-Trimethylbenzene		406							
1,2,4-Trimethylbenzene		1,220							350
Naphthalene		241							20
Total Targeted VOCs		25,213							-
GW Elevation (ft bg)		81.11							-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

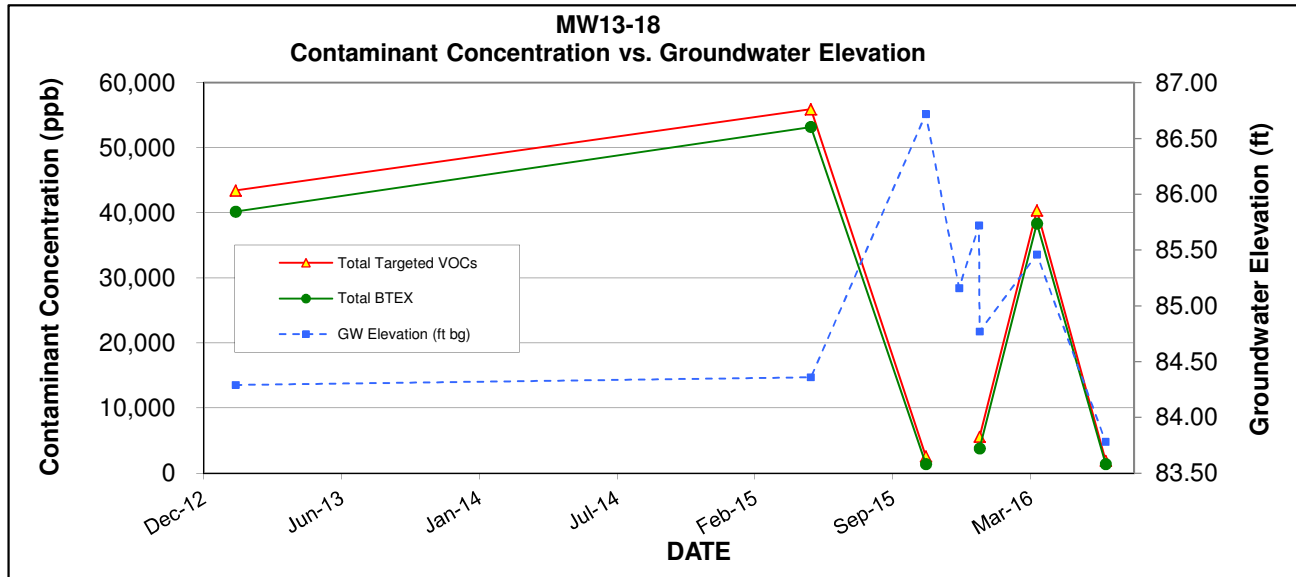
Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



# Groundwater Quality Summary

Shelburne Road Variety  
South Burlington, VT



## MW13-18

PARAMETER	Sample Date Method	1/22/2013 8021B	5/7/2015 8021B	10/21/2015 8021B *SVE/AS on	12/8/2015	1/6/2016 *SVE/AS on	1/7/2016 8021B	3/30/2016 8021B	VGES
Benzene		3,840	6,420	149			512	3,700	5
Toluene		18,600	27,000	179	No	No	258	20,700	1000
Ethylbenzene		3,770	2,990	140	Sample	Sample	566	2,080	700
Xylenes		14,000	16,800	933			2,470	11,900	10000
Total BTEX		40,210	53,210	1,401			3,806	38,380	-
MTBE		592	ND<400	33.1			138	64.0	40
1,3,5-Trimethylbenzene		558	681	428	Gauge	Gauge	416	500	
1,2,4-Trimethylbenzene		2,080	2,030	601	Only	Only	1,060	1,230	350
Naphthalene		441	ND<400	141			147	239	20
Total Targeted VOCs		43,440	55,921	2,604			5,567	40,413	-
GW Elevation (ft bg)		84.29	84.36	86.72	85.16	85.72	84.77	85.46	-

PARAMETER	Sample Date Method	7/8/2016 8021B							VGES
Benzene		401							5
Toluene		132							1000
Ethylbenzene		359							700
Xylenes		519							10000
Total BTEX		1,411							-
MTBE		24.1							40
1,3,5-Trimethylbenzene		89.0							
1,2,4-Trimethylbenzene		324							350
Naphthalene		32.5							20
Total Targeted VOCs		1,881							-
GW Elevation (ft bg)		83.78							-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

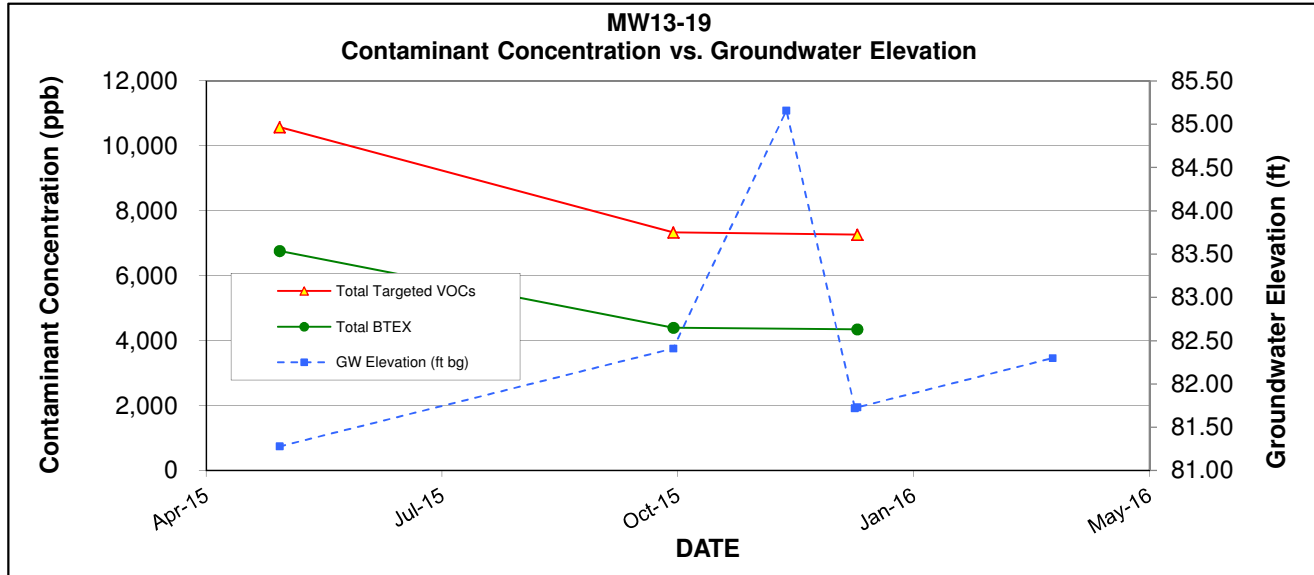
Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



# Groundwater Quality Summary

Shelburne Road Variety  
South Burlington, Vermont



## MW13-19

PARAMETER	Sample Date Method	1/22/2013	5/7/2015 8021B	10/21/2015 8021B *SVE/AS on	12/8/2015	1/6/2016 *SVE/AS on	1/7/2016 8021B	3/30/2016	VGES
Benzene			<b>1,720</b>	<b>960</b>			<b>795</b>		5
Toluene	No		<b>212</b>	<b>118</b>	No	No	<b>59.2</b>	No	1000
Ethylbenzene	Sample		<b>1,170</b>	<b>927</b>	Sample	Sample	<b>983</b>	Sample	700
Xylenes	Collected		<b>3,660</b>	<b>2,390</b>			<b>2,510</b>		10000
Total BTEX			<b>6,762</b>	<b>4,395</b>			<b>4,347</b>		-
MTBE	Well		<b>2,660</b>	<b>1,680</b>			<b>1,570</b>		40
1,3,5-Trimethylbenzene	Dry		<b>256</b>	<b>185</b>	Gauge	Gauge	<b>194</b>	Gauge	
1,2,4-Trimethylbenzene			<b>899</b>	<b>931</b>	Only	Only	<b>989</b>	Only	350
Naphthalene			ND<400	<b>149</b>			<b>163</b>		20
Total Targeted VOCs			<b>10,577</b>	<b>7,340</b>			<b>7,263</b>		-
GW Elevation (ft bg)		NM	81.28	82.41	85.16	81.72	81.73	82.30	-

All Values Reported in ug/L (ppb)

VGES - Vermont Groundwater Enforcement Standard (February 14, 2005)

ND - None detected above sample-specific compound detection limit

**Bold** font indicates a detected concentration.

Shaded values meet or exceed VGES

\* Sampling or gauging occurred while SVE/AS remedial system in operation



# Groundwater Quality Summary

Shelburne Road Variety  
So. Burlington, Vermont

## Quality Assurance/Control Samples

PARAMETER	3/30/2016			
	Trip Blank	MW10-6	Duplicate	RPD %
MTBE	ND(2.0)	<b>362</b>	<b>347</b>	<b>4.2</b>
Benzene	ND(1.0)	<b>5,690</b>	<b>5,430</b>	<b>4.7</b>
Toluene	ND(1.0)	<b>7,320</b>	<b>6,940</b>	<b>5.3</b>
Ethylbenzene	ND(1.0)	<b>2,830</b>	<b>2,730</b>	<b>3.6</b>
Xylenes	ND(2.0)	<b>10,700</b>	<b>10,600</b>	<b>0.9</b>
1,3,5-TMB*	ND(1.0)	<b>312</b>	<b>311</b>	<b>0.3</b>
1,2,4-TMB*	ND(1.0)	<b>1,280</b>	<b>1,300</b>	<b>1.6</b>
Naphthalene	ND(2.0)	<b>257</b>	<b>265</b>	<b>3.1</b>
Total Reported VOCs	ND	<b>28,751</b>	<b>27,923</b>	<b>2.9</b>

PARAMETER	7/8/2016			
	Trip Blank	MW13-7	Duplicate	RPD %
MTBE	ND(2.0)	<b>756</b>	<b>680</b>	<b>10.6</b>
Benzene	ND(1.0)	<b>1,500</b>	<b>1,600</b>	<b>6.5</b>
Toluene	ND(1.0)	<b>8,720</b>	<b>8,240</b>	<b>5.7</b>
Ethylbenzene	ND(1.0)	<b>2,170</b>	<b>2,050</b>	<b>5.7</b>
Xylenes	ND(2.0)	<b>10,200</b>	<b>9,710</b>	<b>4.9</b>
1,3,5-TMB*	ND(1.0)	<b>406</b>	<b>409</b>	<b>0.7</b>
1,2,4-TMB*	ND(1.0)	<b>1,220</b>	<b>1,220</b>	<b>0.0</b>
Naphthalene	ND(2.0)	<b>241</b>	<b>234</b>	<b>2.9</b>
Total Reported VOCs	ND	<b>25,213</b>	<b>24,143</b>	<b>4.3</b>

The results of the laboratory analysis of the duplicate sample were analyzed using a relative percent difference (RPD) analysis. The RPD is defined as 100 times the difference in reported concentration between sample and duplicate, divided by the mean of the two samples. A small RPD indicates good correlation between sample and duplicate.

### NOTES

Results reported above detection limits are indicated in bold

\* TMB = Trimethyl Benzene

EPA Method 8021B used for laboratory analysis

All values reported in ug/l (ppb) unless otherwise noted

ND<X - Not Detected (Detection Limit)

n/a = not applicable



## **Appendix E**

### **Analytical Laboratory Reports**



## Laboratory Report

KAS, Inc.	100306
PO Box 787	
Williston, VT 05495	
Atten: Rebecca Treat	

PROJECT: 410090357 Shelbure Rd Variety

WORK ORDER: **1604-06241**

DATE RECEIVED: April 01, 2016

DATE REPORTED: April 06, 2016

SAMPLER: Rebecca

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. All required method quality control elements including instrument calibration were performed in accordance with method requirements and determined to be acceptable unless otherwise noted.

The column labeled Lab/Tech in the accompanying report denotes the laboratory facility where the testing was performed and the technician who conducted the assay. A "W" designates the Williston, VT lab under NELAC certification ELAP 11263; "R" designates the Lebanon, NH facility under certification NH 2037 and "N" the Plattsburgh, NY lab under certification ELAP 11892. "Sub" indicates the testing was performed by a subcontracted laboratory. The accreditation status of the subcontracted lab is referenced in the corresponding NELAC and Qual fields.

The NELAC column also denotes the accreditation status of each laboratory for each reported parameter. "A" indicates the referenced laboratory is NELAC accredited for the parameter reported. "N" indicates the laboratory is not accredited. "U" indicates that NELAC does not offer accreditation for that parameter in that specific matrix. Test results denoted with an "A" meet all National Environmental Laboratory Accreditation Program requirements except where denoted by pertinent data qualifiers. Test results are representative of the samples as they were received at the laboratory

Endyne, Inc. warrants, to the best of its knowledge and belief, the accuracy of the analytical test results contained in this report, but makes no other warranty, expressed or implied, especially no warranties of merchantability or fitness for a particular purpose.

Reviewed by:

Harry B. Locker, Ph.D.  
Laboratory Director

[www.endynelabs.com](http://www.endynelabs.com)



160 James Brown Dr., Williston, VT 05495  
Ph 802-879-4333 Fax 802-879-7103

56 Etna Road, Lebanon, NH 03766  
Ph 603-678-4891 Fax 603-678-4893





CLIENT: KAS, Inc.  
 PROJECT: 410090357 Shelbure Rd Variety  
 REPORT DATE: 4/6/2016

WORK ORDER: 1604-06241  
 DATE RECEIVED: 04/01/2016

## TEST METHOD: EPA 8260C

001 Site: MW10-2 Date Sampled: 3/30/16 12:55 Analysis Date: 4/5/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	314	ug/L	A		Benzene	341	ug/L	A	
Toluene	512	ug/L	A		Ethylbenzene	281	ug/L	A	
Xylenes, Total	1,800	ug/L	A		1,3,5-Trimethylbenzene	119	ug/L	A	
1,2,4-Trimethylbenzene	405	ug/L	A		Naphthalene	< 100	ug/L	A	
Surr. 1 (Dibromofluoromethane)	103	%	A		Surr. 3 (4-Bromofluorobenzene)	97	%	A	
Surr. 2 (Toluene d8)	105	%	A		Unidentified Peaks	> 10		U	

## TEST METHOD: EPA 8260C

002 Site: MW10-3 Date Sampled: 3/30/16 12:50 Analysis Date: 4/5/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 200	ug/L	A		Benzene	1,550	ug/L	A	
Toluene	8,100	ug/L	A		Ethylbenzene	1,490	ug/L	A	
Xylenes, Total	7,500	ug/L	A		1,3,5-Trimethylbenzene	173	ug/L	A	
1,2,4-Trimethylbenzene	686	ug/L	A		Naphthalene	130	ug/L	A	
Surr. 1 (Dibromofluoromethane)	104	%	A		Surr. 2 (Toluene d8)	104	%	A	
Surr. 3 (4-Bromofluorobenzene)	99	%	A		Unidentified Peaks	> 10		U	

## TEST METHOD: EPA 8260C

003 Site: MW10-4 Date Sampled: 3/30/16 12:40 Analysis Date: 4/5/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	A		Benzene	1.1	ug/L	A	
Toluene	< 1.0	ug/L	A		Ethylbenzene	< 1.0	ug/L	A	
Xylenes, Total	< 2.0	ug/L	A		1,3,5-Trimethylbenzene	< 1.0	ug/L	A	
1,2,4-Trimethylbenzene	< 1.0	ug/L	A		Naphthalene	< 2.0	ug/L	A	
Surr. 1 (Dibromofluoromethane)	96	%	A		Surr. 2 (Toluene d8)	109	%	A	
Surr. 3 (4-Bromofluorobenzene)	102	%	A		Unidentified Peaks	> 10		U	

## TEST METHOD: EPA 8260C

004 Site: MW10-5 Date Sampled: 3/30/16 12:35 Analysis Date: 4/4/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	283	ug/L	A		Benzene	81.0	ug/L	A	
Toluene	175	ug/L	A		Ethylbenzene	53.5	ug/L	A	
Xylenes, Total	438	ug/L	A		1,3,5-Trimethylbenzene	< 50.0	ug/L	A	
1,2,4-Trimethylbenzene	77.5	ug/L	A		Naphthalene	< 100	ug/L	A	
Surr. 1 (Dibromofluoromethane)	97	%	A		Surr. 2 (Toluene d8)	99	%	A	
Surr. 3 (4-Bromofluorobenzene)	92	%	A		Unidentified Peaks	7		U	

## TEST METHOD: EPA 8260C

005 Site: MW10-6 Date Sampled: 3/30/16 12:30 Analysis Date: 4/4/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	362	ug/L	A		Benzene	5,690	ug/L	A	
Toluene	7,320	ug/L	A		Ethylbenzene	2,830	ug/L	A	
Xylenes, Total	10,700	ug/L	A		1,3,5-Trimethylbenzene	312	ug/L	A	
1,2,4-Trimethylbenzene	1,280	ug/L	A		Naphthalene	257	ug/L	A	
Surr. 1 (Dibromofluoromethane)	95	%	A		Surr. 2 (Toluene d8)	105	%	A	
Surr. 3 (4-Bromofluorobenzene)	92	%	A		Unidentified Peaks	> 10		U	

CLIENT: KAS, Inc.  
 PROJECT: 410090357 Shelbure Rd Variety  
 REPORT DATE: 4/6/2016

WORK ORDER: 1604-06241  
 DATE RECEIVED: 04/01/2016

## TEST METHOD: EPA 8260C

006 Site: MW12-14 Date Sampled: 3/30/16 13:05 Analysis Date: 4/5/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	618	ug/L	A		Benzene	4,940	ug/L	A	
Toluene	15,600	ug/L	A		Ethylbenzene	1,090	ug/L	A	
Xylenes, Total	5,680	ug/L	A		1,3,5-Trimethylbenzene	127	ug/L	A	
1,2,4-Trimethylbenzene	450	ug/L	A		Naphthalene	92.4	ug/L	A	
Surr. 1 (Dibromofluoromethane)	99	%	A		Surr. 2 (Toluene d8)	98	%	A	
Surr. 3 (4-Bromofluorobenzene)	90	%	A		Unidentified Peaks	> 10		U	

## TEST METHOD: EPA 8260C

007 Site: MW13-17 Date Sampled: 3/30/16 12:45 Analysis Date: 4/4/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	914	ug/L	A		Benzene	2,480	ug/L	A	
Toluene	13,800	ug/L	A		Ethylbenzene	2,520	ug/L	A	
Xylenes, Total	12,900	ug/L	A		1,3,5-Trimethylbenzene	382	ug/L	A	
1,2,4-Trimethylbenzene	1,330	ug/L	A		Naphthalene	< 400	ug/L	A	
Surr. 1 (Dibromofluoromethane)	98	%	A		Surr. 2 (Toluene d8)	98	%	A	
Surr. 3 (4-Bromofluorobenzene)	94	%	A		Unidentified Peaks	> 10		U	

## TEST METHOD: EPA 8260C

008 Site: MW13-18 Date Sampled: 3/30/16 13:00 Analysis Date: 4/4/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	64.0	ug/L	A		Benzene	3,700	ug/L	A	
Toluene	20,700	ug/L	A		Ethylbenzene	2,080	ug/L	A	
Xylenes, Total	11,900	ug/L	A		1,3,5-Trimethylbenzene	500	ug/L	A	
1,2,4-Trimethylbenzene	1,230	ug/L	A		Naphthalene	239	ug/L	A	
Surr. 1 (Dibromofluoromethane)	98	%	A		Surr. 2 (Toluene d8)	105	%	A	
Surr. 3 (4-Bromofluorobenzene)	96	%	A		Unidentified Peaks	> 10		U	

## TEST METHOD: EPA 8260C

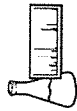
009 Site: Duplicate Date Sampled: 3/30/16 12:30 Analysis Date: 4/4/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	347	ug/L	A		Benzene	5,430	ug/L	A	
Toluene	6,940	ug/L	A		Ethylbenzene	2,730	ug/L	A	
Xylenes, Total	10,600	ug/L	A		1,3,5-Trimethylbenzene	311	ug/L	A	
1,2,4-Trimethylbenzene	1,300	ug/L	A		Naphthalene	265	ug/L	A	
Surr. 1 (Dibromofluoromethane)	94	%	A		Surr. 2 (Toluene d8)	97	%	A	
Surr. 3 (4-Bromofluorobenzene)	92	%	A		Unidentified Peaks	> 10		U	

## TEST METHOD: EPA 8260C

010 Site: Trip Blank Date Sampled: 3/29/16 15:30 Analysis Date: 4/4/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	A		Benzene	< 1.0	ug/L	A	
Toluene	< 1.0	ug/L	A		Ethylbenzene	< 1.0	ug/L	A	
Xylenes, Total	< 2.0	ug/L	A		1,3,5-Trimethylbenzene	< 1.0	ug/L	A	
1,2,4-Trimethylbenzene	< 1.0	ug/L	A		Naphthalene	< 2.0	ug/L	A	
Surr. 1 (Dibromofluoromethane)	102	%	A		Surr. 2 (Toluene d8)	101	%	A	
Surr. 3 (4-Bromofluorobenzene)	98	%	A		Unidentified Peaks	0		U	



# CHAIN-OF-CUSTODY-RECORD

160 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333

# CHAIN-OF-CUSTODY-RECORD

75377

Special Reporting Instructions/PO#: 410090357

Project Name: <b>SHELBUENE ROAD VARIETY</b>	Client/Contact Name: <b>KAS / REBELLA TREAT</b>	Sampler Name: <b>RT</b>
State of Origin: <b>VT X NY NH Other</b>	Phone #: <b>802-383-0486</b>	Phone #: <b>SAME</b>
Endyne WO # <b>1604-06241</b>	Mailing Address: <b>PO BOX 787 WILLISTON VT 05495</b>	Billing Address: <b>SAME</b>

Sample Location	Matrix	G M P	G M P	Sample Containers		Sample Preservation	Analysis Required	Field Results/Remarks	Due Date
				No.	Type/Size				
MW10-2	H <sub>2</sub> O	X		2	40mL vial	HCL	19		
MW10-3									
MW 10-4									
MW 10-5									
MW 10-6									
MW 12-14									
MW 13-17									
MW 13-18									
Duplicate									
TRR Blank									

**1604-06241**

**1604-06241**

KAS, Inc.  
410090357 Shelburne Rd Variety

Relinquished by: <i>[Signature]</i>	Date/Time: <b>03/30/16 1650</b>	Received by: <i>[Signature]</i>	Date/Time: <b>4/1/16</b>
			LAB USE ONLY
			Delivery: <b>Client</b>
			Temp: <b>0.5</b>
			Comment:

Received by:	Date/Time	Received by:	Date/Time
26	8270 PAH Only	26	1664 TPH/FOG
27	8081 Pest	22	8015 GRO
28	8082 PCB	23	8015 DRO
29	PP13 Metals	24	8260B
30	Total RCRA8	25	8270 B/N or Acid
16	Sulfate	19	VT PCF
17	Coliform (Specify)	20	VOC Halocarbons
18	COD	33	Other
19	Conductivity	36	Reactivity
20	Metals (Total, Diss.) Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Ti, U, V, Zn	37	Other
21	TCLP (volatiles, semi-volatiles, metals, pesticides, herbicides)		
22	Corrosivity		
23	Ignitability		
24	Other		



## Laboratory Report

KAS, Inc.	100306
PO Box 787	
Williston, VT 05495	
Atten: Rebecca Treat	

PROJECT: 410090357 Shelburne Rd Variety

WORK ORDER: **1607-14739**

DATE RECEIVED: July 12, 2016

DATE REPORTED: July 25, 2016

SAMPLER: Rebecca Treat

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. All required method quality control elements including instrument calibration were performed in accordance with method requirements and determined to be acceptable unless otherwise noted.

The column labeled Lab/Tech in the accompanying report denotes the laboratory facility where the testing was performed and the technician who conducted the assay. A "W" designates the Williston, VT lab under NELAC certification ELAP 11263; "R" designates the Lebanon, NH facility under certification NH 2037 and "N" the Plattsburgh, NY lab under certification ELAP 11892. "Sub" indicates the testing was performed by a subcontracted laboratory. The accreditation status of the subcontracted lab is referenced in the corresponding NELAC and Qual fields.

The NELAC column also denotes the accreditation status of each laboratory for each reported parameter. "A" indicates the referenced laboratory is NELAC accredited for the parameter reported. "N" indicates the laboratory is not accredited. "U" indicates that NELAC does not offer accreditation for that parameter in that specific matrix. Test results denoted with an "A" meet all National Environmental Laboratory Accreditation Program requirements except where denoted by pertinent data qualifiers. Test results are representative of the samples as they were received at the laboratory

Endyne, Inc. warrants, to the best of its knowledge and belief, the accuracy of the analytical test results contained in this report, but makes no other warranty, expressed or implied, especially no warranties of merchantability or fitness for a particular purpose.

Reviewed by:

Harry B. Locker, Ph.D.  
Laboratory Director

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160 James Brown Dr., Williston, VT 05495  
Ph 802-879-4333 Fax 802-879-7103

56 Etna Road, Lebanon, NH 03766  
Ph 603-678-4891 Fax 603-678-4893



CLIENT: KAS, Inc.  
 PROJECT: 410090357 Shelburne Rd Variety  
 REPORT DATE: 7/25/2016

WORK ORDER: 1607-14739  
 DATE RECEIVED: 07/12/2016

## TEST METHOD: EPA 8021B

001 Site: MW10-1 Date Sampled: 7/8/16 11:18 Analysis Date: 7/20/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	11.1	ug/L	N		Benzene	< 1.0	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		Naphthalene	< 2.0	ug/L	N	
Surr. 1 (Bromobenzene)	101	%	N		Unidentified Peaks	0		N	

## TEST METHOD: EPA 8021B

002 Site: MW10-2 Date Sampled: 7/8/16 11:40 Analysis Date: 7/20/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	243	ug/L	N		Benzene	372	ug/L	N	
Toluene	562	ug/L	N		Ethylbenzene	781	ug/L	N	
Xylenes, Total	3,100	ug/L	N		1,3,5-Trimethylbenzene	305	ug/L	N	
1,2,4-Trimethylbenzene	881	ug/L	N		Naphthalene	< 200	ug/L	N	
Surr. 1 (Bromobenzene)	95	%	N		Unidentified Peaks	> 10		N	

## TEST METHOD: EPA 8021B

003 Site: MW10-3 Date Sampled: 7/8/16 12:28 Analysis Date: 7/20/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 40.0	ug/L	N		Benzene	109	ug/L	N	
Toluene	1,080	ug/L	N		Ethylbenzene	247	ug/L	N	
Xylenes, Total	1,390	ug/L	N		1,3,5-Trimethylbenzene	47.0	ug/L	N	
1,2,4-Trimethylbenzene	141	ug/L	N		Naphthalene	< 40.0	ug/L	N	
Surr. 1 (Bromobenzene)	100	%	N		Unidentified Peaks	> 10		N	

## TEST METHOD: EPA 8021B

004 Site: MW10-4 Date Sampled: 7/8/16 12:35 Analysis Date: 7/20/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	2.1	ug/L	N		Benzene	2.1	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		Naphthalene	< 2.0	ug/L	N	
Surr. 1 (Bromobenzene)	102	%	N		Unidentified Peaks	6		N	

## TEST METHOD: EPA 8021B

005 Site: MW10-5 Date Sampled: 7/8/16 12:40 Analysis Date: 7/21/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	95.3	ug/L	N		Benzene	44.4	ug/L	N	
Toluene	17.2	ug/L	N		Ethylbenzene	15.6	ug/L	N	
Xylenes, Total	89.0	ug/L	N		1,3,5-Trimethylbenzene	29.9	ug/L	N	
1,2,4-Trimethylbenzene	67.5	ug/L	N		Naphthalene	6.2	ug/L	N	
Surr. 1 (Bromobenzene)	84	%	N		Unidentified Peaks	> 10		N	

CLIENT: KAS, Inc.  
 PROJECT: 410090357 Shelburne Rd Variety  
 REPORT DATE: 7/25/2016

WORK ORDER: 1607-14739  
 DATE RECEIVED: 07/12/2016

## TEST METHOD: EPA 8021B

006 Site: MW10-6 Date Sampled: 7/8/16 12:55 Analysis Date: 7/20/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 200	ug/L	N		Benzene	4,560	ug/L	N	
Toluene	8,400	ug/L	N		Ethylbenzene	2,670	ug/L	N	
Xylenes, Total	10,100	ug/L	N		1,3,5-Trimethylbenzene	377	ug/L	N	
1,2,4-Trimethylbenzene	1,400	ug/L	N		Naphthalene	259	ug/L	N	
Surr. 1 (Bromobenzene)	97	%	N		Unidentified Peaks	> 10		N	

## TEST METHOD: EPA 8021B

007 Site: MW11-9 Date Sampled: 7/8/16 14:45 Analysis Date: 7/20/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	359	ug/L	N		Benzene	730	ug/L	N	
Toluene	62.3	ug/L	N		Ethylbenzene	600	ug/L	N	
Xylenes, Total	1,730	ug/L	N		1,3,5-Trimethylbenzene	136	ug/L	N	
1,2,4-Trimethylbenzene	554	ug/L	N		Naphthalene	126	ug/L	N	
Surr. 1 (Bromobenzene)	90	%	N		Unidentified Peaks	> 10		N	

## TEST METHOD: EPA 8021B

008 Site: MW12-13 Date Sampled: 7/8/16 14:10 Analysis Date: 7/21/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	289	ug/L	N		Benzene	1,930	ug/L	N	
Toluene	43.5	ug/L	N		Ethylbenzene	497	ug/L	N	
Xylenes, Total	121	ug/L	N		1,3,5-Trimethylbenzene	< 20.0	ug/L	N	
1,2,4-Trimethylbenzene	87.8	ug/L	N		Naphthalene	23.2	ug/L	N	
Surr. 1 (Bromobenzene)	94	%	N		Unidentified Peaks	> 10		N	

## TEST METHOD: EPA 8021B

009 Site: MW12-15 Date Sampled: 7/8/16 13:55 Analysis Date: 7/21/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	465	ug/L	N		Benzene	2,540	ug/L	N	
Toluene	918	ug/L	N		Ethylbenzene	859	ug/L	N	
Xylenes, Total	1,890	ug/L	N		1,3,5-Trimethylbenzene	78.6	ug/L	N	
1,2,4-Trimethylbenzene	499	ug/L	N		Naphthalene	78.0	ug/L	N	
Surr. 1 (Bromobenzene)	93	%	N		Unidentified Peaks	> 10		N	

## TEST METHOD: EPA 8021B

010 Site: MW13-17 Date Sampled: 7/8/16 12:45 Analysis Date: 7/21/16 W MHM

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	756	ug/L	N		Benzene	1,500	ug/L	N	
Toluene	8,720	ug/L	N		Ethylbenzene	2,170	ug/L	N	
Xylenes, Total	10,200	ug/L	N		1,3,5-Trimethylbenzene	406	ug/L	N	
1,2,4-Trimethylbenzene	1,220	ug/L	N		Naphthalene	241	ug/L	N	
Surr. 1 (Bromobenzene)	91	%	N		Unidentified Peaks	> 10		N	

CLIENT: KAS, Inc.  
 PROJECT: 410090357 Shelburne Rd Variety  
 REPORT DATE: 7/25/2016

WORK ORDER: **1607-14739**  
 DATE RECEIVED: 07/12/2016

TEST METHOD: EPA 8021B

011 Site: MW13-18 Date Sampled: 7/8/16 11:05 Analysis Date: 7/20/16 W MHM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Nelac</u>	<u>Qual</u>	<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Nelac</u>	<u>Qual</u>
Methyl-t-butyl ether (MTBE)	24.1	ug/L	N		Benzene	401	ug/L	N	
Toluene	132	ug/L	N		Ethylbenzene	359	ug/L	N	
Xylenes, Total	519	ug/L	N		1,3,5-Trimethylbenzene	89.0	ug/L	N	
1,2,4-Trimethylbenzene	324	ug/L	N		Naphthalene	32.5	ug/L	N	
Surr. 1 (Bromobenzene)	93	%	N		Unidentified Peaks	> 10		N	

TEST METHOD: EPA 8021B

012 Site: Duplicate Date Sampled: 7/8/16 12:50 Analysis Date: 7/20/16 W MHM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Nelac</u>	<u>Qual</u>	<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Nelac</u>	<u>Qual</u>
Methyl-t-butyl ether (MTBE)	680	ug/L	N		Benzene	1,600	ug/L	N	
Toluene	8,240	ug/L	N		Ethylbenzene	2,050	ug/L	N	
Xylenes, Total	9,710	ug/L	N		1,3,5-Trimethylbenzene	409	ug/L	N	
1,2,4-Trimethylbenzene	1,220	ug/L	N		Naphthalene	234	ug/L	N	
Surr. 1 (Bromobenzene)	93	%	N		Unidentified Peaks	> 10		N	

TEST METHOD: EPA 8021B

013 Site: Trip Blank Date Sampled: 7/8/16 10:15 Analysis Date: 7/20/16 W MHM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Nelac</u>	<u>Qual</u>	<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Nelac</u>	<u>Qual</u>
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	N		Benzene	< 1.0	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		Naphthalene	< 2.0	ug/L	N	
Surr. 1 (Bromobenzene)	101	%	N		Unidentified Peaks	0		N	



CHAIN-OF-CUSTODY-RECORD

160 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333

75579

Special Reporting Instructions/PO#: 410090357

Project Name: SHELburne Road Variety

Client/Contact Name: KAS INC / REBECCA TRENT

State of Origin: VT  NY  NH  Other

Endyne WO # \_\_\_\_\_

Phone #: 802-383-0486

Mailing Address: PO Box 787  
Williston, VT

Sampler Name: RT

Phone #: SAME

Billing Address: SAME

Sample Location	Matrix	G R B	C O M P	Date/Time Sampled	Sample Containers		Sample Preservation	Analysis Required	Field/Results/Remarks	Due Date
					No.	Type/Size				
MU10-1	GW	X		07/08/16 / 1118	2	46mL vol	HCL	19		
MU10-2				1140						
MU10-3				1228						
MU10-4				1235						
MU10-5				1240						
MU10-6				1255						
MW 11-9				1445						
MW 12-13				1410						
MW 12-15				1355						
MW 13-17				1245						

Relinquished by: [Signature] Date/Time: 07/08/16 16:00

Received by: [Signature] Date/Time: 7/11/16 11:14

Received by: [Signature] Date/Time: 7/12/16 11:20

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
PH	TKN	Total Solids	Sulfate	1664 TPH/FOG	8270 PAH Only	Chloride	Total P	TSS	Coliform (Specific)	8015 GRO	8081 Pest	Ammonia N	Total Diss. P	TDS	8015 DRO	8082 PCB	Nitrite N	BOD	VT PCF	8260B	Nitrate N	Alkalinity	Conductivity	VOC Halocarbons	8270 B/N or Acid	Total	Metals (Total, Diss.) Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Tl, U, V, Zn	TCLP (volatiles, semi-volatiles, metals, pesticides, herbicides)	Other	Corrosivity	Ignitability	Reactivity	Other	Other			

LAB USE ONLY

Delivery: Client

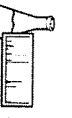
Temp: 0.4

**1607-14739**

1607-14739

KAS, Inc. Shelburne Variety  
410090357





**ENDYNE, INC.**  
160 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333

### CHAIN-OF-CUSTODY-RECORD

75580

Special Reporting Instructions/PO#: 410090357

Project Name: <u>SHELBURNE ROAD VARIETY</u>	Client/Contact Name: <u>KAS INC / REBECCA TREAR</u>	Sampler Name: <u>RT</u>
State of Origin: VT <input checked="" type="checkbox"/> NY <input type="checkbox"/> NH <input type="checkbox"/> Other <input type="checkbox"/>	Phone #: <u>802-383-0486</u>	Phone #: <u>SAME</u>
Endyne WO #	Mailing Address: <u>PO BOX 787 WILLISTON, VT</u>	Billing Address: <u>SAME</u>

Sample Location	Matrix	GRA B	COM P	Date/Time Sampled	Sample Containers		Sample Preservation	Analysis Required	Field Results/Remarks	Due Date
					No.	Type/Size				
MM13-18	GW	X		07/08/16 / 1105	2	40 mL vial	HCL	19		
DUPLICATE	↓			1250						
TRIP BLANK	DN	↓		1015						

Relinquished by: [Signature] Date/Time: 07/08/16 / 1105 Received by: [Signature] Date/Time: 7/12/16 1114

Received by: [Signature] Date/Time: 7/12/16 1114

1	pH	6	TKN	11	Total Solids	16	Sulfate	21	1664 TPH/FOG	26	8270 PAH Only	LAB USE ONLY Delivery: <u>Client</u> Temp: <u>0.4</u> Comment:
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	8015 GRO	27	8081 Pest	
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	8015 DRO	28	8082 PCB	
4	Nitrite N	9	BOD	14	Turbidity	19	VT PCF	24	8260B	29	PP13 Metals	
5	Nitrate N	10	Alkalinity	15	Conductivity	20	VOC Halocarbons	25	8270 B/N or Acid	30	Total RCRA8	
31	Metals (Total, Diss.) Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Tl, U, V, Zn											
32	TCLP (volatiles, semi-volatiles, metals, pesticides, herbicides)											
34	Corrosivity	35	Ignitability	36	Reactivity	37	Other					
38	Other											