# SITE MONITORING REPORT

# LONDONDERRY CITGO
# LONDONDERRY, VERMONT

# NOVEMBER 2004

# VT DEC SITE # 96-2015

**Prepared For:**

**Rice Oil Company, Inc.**
**Greenfield, MA**

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# EXECUTIVE SUMMARY

This report summarizes the progress of remedial efforts at Londonderry Citgo located in Londonderry Center, Vermont conducted by Environmental Compliance Services, Inc. (ECS) during the period of April 2004 through September 2004. Activities that took place during this reporting period include: quarterly sampling of nearby supply well treatment systems, semi-annual groundwater sampling, and the operations and maintenance of the air sparging and soil vapor extraction (AS/SVE) system. Activities and findings from the quarterly treatment system sampling were summarized in a separate report dated August 2004 entitled "*Quarterly Treatment System Monitoring Letter Report*". ECS findings during this report period are summarized as follows:

- Results indicate that residual gasoline related volatile organic compound (VOC) contamination is still present within the surficial and bedrock aquifer.

- The Vermont Groundwater Enforcement Standard (VGES) for at least one petroleum hydrocarbon continue to be exceeded in site monitoring wells MW-3, MW-8, SP-1, SP-2, and SP-3. The gasoline additive methyl tert butyl ether (MTBE) continues to be detected in monitoring wells MW-3, MW-7, MW-8, SP-1, SP-2, and SP-3.

- No groundwater samples were collected from MW-S2 and MW-S3 because a large dumpster was on top of the wells. Monitoring well SP-4 was not sampled because the well was dry.

- Analytical results from the September 2004 site visit indicate that with the exception of MTBE no other petroleum hydrocarbons were detected in the shopping center's main drinking water supply well treatment system samples.

- MTBE continues to be detected in samples collected from the shopping center's main drinking-water supply well's influent, mid-carbon and effluent. Laboratory analytical reports from the 14 September 2004 system effluent sample indicated that concentrations exceeded the Vermont Health Advisory (VHA) of 40 micrograms per liter (µg/L) for MTBE. Water Works, who services the treatment system, was notified verbally of the treatment system break-through on 28 October 2004. It was also discussed with Water Works, that historical sampling results demonstrate that the current treatment system has not been effective at eliminating MTBE. It was suggested the frequency of carbon change out and service of the treatment system should be increased.

- ECS had requested permission to gain access to the Thorne-Thomsen property for the sampling of the treatment system on separate occasions via phone call, but the phone calls were not returned. No one was home at the Thorne-Thomsen residence during the September 2004 site visit, and therefore, the treatment system was not sampled. ECS will attempt to sample the Thorne-Thompsen well again in December 2004 during the quarterly sampling.

- An estimated 29 pounds of gasoline mass were recovered from the subsurface by the AS/SVE System between 16 March 2004 and 14 September 2004, bringing the total gasoline mass recovered since January 1999 to 419 pounds. Estimated mass-recovery rates during this reporting period ranged from 0.087 to 0.226 pounds per day (lbs./day). These data represent a continued decrease in mass removal rate.

# EXECUTIVE SUMMARY

- The SVE portion of the system was operational 100 percent of the time during this reporting period. The AS portion of the system was operational approximately 66 percent of the time. The AS/SVE system is currently operational.

Based on the above findings, it is the opinion of ECS that the site does not meet the criteria for a Site Management Activity Completion designation, and that continued monitoring is required until no VGES exceedances are noted at down gradient compliance wells and surrounding supply wells. ECS recommends the following:

1. Groundwater sampling and analysis of all onsite monitoring wells should continue on a semi-annual basis, with the next groundwater monitoring event to take place March 2005.

2. The nearby residential supply wells should continue to be monitored annually, with the next sampling event to be conducted in March 2005. With the exception of the Roger's residence, the sampling list should be reduced to residences located within a 500ft. radius instead of the previously determined list of residences located within 1,000 ft of the Londonderry Citgo., given two years of non-detected petroleum related contaminants. The residences that are within the 500 ft radius of the contaminant source include: Gordon, Rowley, the Second Congregational Church and it's associated "Store", and the Abbott residence.

3. Quarterly sampling of nearby supply well treatment systems of the Thorne-Thompsen residence, and Londonderry Shopping Center should continue, with the next sampling event to be conducted in December 2004. In addition to supply well sampling, the Roger's supply well should be included in this quarterly sampling plan.

4. Remediation system checks and maintenance should continue to be conducted on a monthly basis.

5. Field data should be collected during system checks, such as dissolved oxygen, vacuum, and pressure from existing monitoring points to evaluate sparge and extraction influence. This data will be used to determine if the existing AS/SVE system is affecting residual contaminants within the source area.

6. The supply well treatment system for the Londonderry Shopping Center should be reevaluated and upgraded given historical MTBE contaminant breakthrough.

# 1.0 INTRODUCTION

This report details the results of site remediation and monitoring at Londonderry Citgo, located at the intersection of Vermont Routes 11 and 100 South in the town of Londonderry, Vermont (Figure 1) during April 2004 through September 2004. This report has been prepared by Environmental Compliance Services, Inc. (ECS) under the direction of Mr. Gary Thurston, of Rice Oil Company.

Marin Environmental (Marin) conducted an initial site investigation in the Fall of 1996, after gasoline compounds were identified in three bedrock supply wells located near the Londonderry Citgo (Figure 2). The results of the initial site investigation suggested that gasoline had been released in the vicinity of the underground storage tank (UST) system at the Citgo station. The release or releases appeared to have impacted the nearby bedrock supply wells, and posed a risk of contamination to other supply wells, Utley Brook located approximately 200 feet northeast of the Citgo station, and the West River located approximately 400 feet south of the Citgo station.

Historical groundwater analytical results indicate that the overburden aquifer beneath the site is contaminated with gasoline compounds. The Vermont Groundwater Enforcement Standards (VGESs) for several VOCs have been exceeded in the groundwater sample collected from monitoring well MW-2, located approximately 20 feet south of the pump island. Methyl-tertiary butyl ether (MTBE) has also repeatedly been detected at concentrations above the VGES at MW-S2, which is located approximately 220 feet downgradient of the former UST system.

Groundwater from the bedrock aquifer is the sole source of drinking water for the site and surrounding properties. Eighteen individual bedrock supply wells are located within 1,000 feet of the site. Analytical results of samples collected from the adjacent supply wells in November 1996 indicated that five shallow bedrock supply wells near the site were contaminated with gasoline compounds: two on-site supply wells and three off-site supply wells. One on-site and one off-site well — the shopping center's main supply well and the Thorne-Thomsen residential well, contained benzene at concentrations that exceeded the VGES of 5 micrograms per liter (µg/L), as well as detectable levels of MTBE.

In May 1998, the Vermont Department of Environmental Conservation (VTDEC) approved Marin's Corrective Action Plan (CAP) for the site, which recommended air sparging and soil vapor extraction (AS/SVE) at the source area, with the continued operation of point-of-use carbon treatment systems at the shopping center's main supply well and the Thorne-Thomsen residential well. Installation of the subsurface components of the remediation system was completed in May 1998, construction of the treatment shed was completed in August 1998, and the system started operation in January 1999.

The AS/SVE system operated intermittently until it was shut down September 2000 when mass removal rates decreased to asymptotic levels. Since system shutdown, groundwater VOC concentrations have rebounded in wells primarily limited to the former UST source area, and an area immediately west of the pump island. The remedial system was restarted after system evaluation and trouble shooting on February 18, 2004, and has been running continuously to date .

# 2.0 SCOPE OF WORK

The work completed during this report period involved the following activities:

- Collection and submittal of groundwater samples from the on-site monitoring wells for laboratory analysis of volatile organic compounds (VOCs) and by EPA method 8021B, on 14 September 2004;

- Collection and submittal of quarterly supply well samples from the Roger's residence, and the treatment system installed at the Shopping Center's main supply well for laboratory analysis of VOCs;

- Monthly operations and maintenance of the AS/SVE system;

- Preparation of this summary report, which details the work performed, and provides conclusions and offers recommendations for further action.

# 3.0 INVESTIGATIVE PROCEDURES AND RESULTS

## 3.1 DETERMINATION OF GROUNDWATER FLOW DIRECTION AND GRADIENT

On 14 September 2004, groundwater in the unconfined surficial aquifer directly beneath the site continued to be flowing in a southerly direction, toward the West River, with an average horizontal hydraulic gradient of about 3.5 percent. Water-level measurements and elevation calculations for 14 September 2004 are presented in Table 1. The groundwater contour map presented as Figure 3 was prepared using these data.

The depth to water in the unconfined surficial aquifer on 14 September 2004 varied from 7.53 feet (SP-1) to 10.61 feet (MW-7) below top-of-casing (TOC). Static water-table elevations were computed for each monitoring well by subtracting the measured or corrected depth-to-water readings from the surveyed top-of-casing elevations, which are relative to an arbitrary site datum of 100.00 feet.

## 3.2 MONITORING WELL SAMPLING AND ANALYSIS

Groundwater analytical results of samples collected from water-table monitoring wells indicate that the unconfined surficial aquifer beneath the site remains contaminated with gasoline compounds. During the 14 September 2004 semi-annual sampling event, the VGES[1] was exceeded for benzene in SP-1 and SP-3, for 1,3,5 trimethyl benzene in monitoring wells MW-8 and SP-2, for 1,2,4 trimethyl benzene in monitoring wells MW-8, SP-1, SP-2, and SP-3, and for Napthalene in monitoring wells MW-8 and SP-1. VGES for the gasoline additive MTBE was exceeded in monitoring well samples MW-3, MW-8, and SP-1 through SP-3. MTBE was detected at levels below VGESs in monitoring well MW-7. VOCs were not detected in samples collected from monitoring wells MW-5 and MW-6, during this sampling event. It should be noted that wells SP-1, SP-2, and SP-3 are actually sparge wells also used as groundwater monitoring purposes.

A contaminant distribution map for the 14 September 2004 monitoring well sampling event is presented as Figure 4. The analytical results for groundwater samples are summarized on Table 2A and on the time-series graphs in Figures 5 through 16. Laboratory report forms are included in Appendix A.

## 3.2 ROGER'S RESIDENCE SUPPLY WELL SAMPLING AND ANALYSIS

Following the detection of MTBE at a concentration of 22.1 µg/L in the Roger's supply well during the March 2004 annual residential supply well sampling, confirmatory samples were collected on the 16 June 2004 and 11 August 2004 site visits at the request of Mr. Tim Cropley of the Vermont Department of Conservation. Analytical results from both sampling dates indicated that petroleum related VOC's, MTBE and benzene were detected in the supply well.

MTBE was detected in the June 2004 and August 2004 confirmation samples at concentrations of 19.7 µg/L and 13.7 µg/L respectively, which are below the Vermont Health Advisory of 40 µg/L. Benzene

[1]The Vermont Department of Environmental Conservation (VT DEC) has established Groundwater Enforcement Standards (VGESs) for eight petroleum related VOCs, as follows: benzene - 5 µg/L; toluene - 1,000 µg/L; ethylbenzene - 700 µg/L; Total Xylenes - 10,000 µg/L; MTBE, a gasoline additive, - 40 µg/L; 1,3,5-trimethylbenzene - 4 µg/L; 1,2,4- trimethylbenzene - 5 µg/L; and naphthalene - 20 µg/L.

was detected in the June 2004 confirmatory sample at a concentration of 1.4 µg/L, which exceeds the Vermont Action Level (VAL) of 1.0 µg/L.

Since there currently is no treatment system installed for the supply well, Mr. Cropley has coordinated bottled water delivery to the Roger's residence.

### 3.3 WATER SUPPLY TREATMENT SYSTEM SAMPLING AND ANALYSIS

Analytical results of the influent samples collected from bedrock supply well treatment systems at the site indicate that the shallow bedrock aquifer beneath the site continues to be contaminated with gasoline compounds. During this monitoring period (April 2004 through September 2004), no benzene was detected in samples collected from the Shopping Center's main supply well treatment system. MTBE was detected at levels above the Vermont Health Advisory of 40 µg/L in samples collected from Shopping Center's main supply well treatment system.

The Thorne-Thomsen residential supply well was not sampled during this period because ECS could not gain access during the September 2004 monitoring event. The Thorne-Thomsen residential supply well will be sampled during the next quarterly sampling event in December 2004. MTBE was detected at levels below the Vermont Health Advisory of 40 µg/L in influent samples collected from the Thorne-Thomsen residential supply well during the June 2004 quarterly monitoring. The analytical results for the treatment system influent samples are summarized on the time-series graphs in Figures 15 and 16. Laboratory report forms are included in Appendix A. A summary of the monitoring results for the individual treatment systems collected during this monitoring period is included on Table 3A & 3B and discussed below.

**Thorne-Thomsen Residential Well**: The treatment system at this location is a point-of-entry system designed primarily for VOC removal by adsorption to granular activated carbon. This system was installed and is maintained by Vermont Water Treatment Systems of Bristol, Vermont.

**Shopping Center Main Supply Well**: The treatment system at this location is a granular activated carbon based system, designed for VOC removal. This system was installed and is maintained by Vermont Water Works of Manchester, Vermont.

During the report period, this system failed to remove all detectable concentrations of gasoline-related compounds from the drinking water. Gasoline-related additive MTBE was detected in the treatment system influent, mid carbon, and effluent samples at concentrations of 96.4, 57.5, and 53.8 µg/L, respectively. All concentrations were above the MCL for MTBE of 40µg/L. No other gasoline compounds were detected during this monitoring period.

### 3.4 QUALITY ASSURANCE/QUALITY CONTROL

Trip blank and duplicate samples were collected and analyzed for VOCs by EPA Method 8021B to ensure that adequate quality assurance/quality control (QA/QC) standards were maintained. Analytical results from the QA/QC samples indicate that adequate QA/QC was maintained during sample collection and analysis. No VOCs were detected in the trip blanks, and the analytical results for the field duplicate samples collected from MW-8 was within 25 percent of the original sampling results, which is within the EPA 30 percent acceptable range.

### 3.5 REMEDIAL SYSTEM OPERATION AND PERFORMANCE

An estimated 29 pounds of gasoline mass were recovered from the subsurface by the AS/SVE System between 16 March 2004 and 14 September 2004, bringing the total gasoline mass recovered since January 1999 to 419 pounds (Figure 17, Appendix A). Estimated mass-recovery rates during this reporting period ranged from 0.087 to 0.226 pounds per day (lbs./day) (Figure 17, Appendix A). The SVE system was operational 100 percent of the operating period. The AS portion of the system was on 66 percent of the operating period.

The vapor-destruction efficiency of the carbon-treatment system was evaluated during each site visit, when the system was running, by measuring influent and effluent vapor concentrations with a photoionization detector (PID) concentrations. VT DEC guidance documents require that vapor treatment systems show either at least 95% destruction or effluent PID concentrations below five parts per million (ppm). During this reporting period, the system effluent PID readings exceeded the five ppm standard during three separate site visits. New vapor phase carbon vessels were ordered and installed in November 2004

A trained ECS field technician continued to monitor the remedial system during site visits throughout this operating period, checking and recording system operating parameters and making repairs and adjustments as necessary. Measurements during each scheduled visit included: VOC concentrations in each SVE line and downstream of the manifold using a PID (Table 5, Appendix A); vacuum levels in each SVE line (Table 6, Appendix A); and influent and effluent PID readings on the carbon treatment system (Table 7, Appendix A), and SVE flow rates (Table 8, Appendix A). The PID was calibrated on each day of use to a benzene reference using an isobutylene standard gas.

The SVE portion of the system consists of five horizontal vapor extraction wells operating continuously. The combined piping comes to the surface in the treatment shed where it is manifolded together. The subsurface vapors are drawn through the piping by using a 1.5 horsepower (HP) Rotron regenerative blower, which removes air from the subsurface at a rate of approximately 88 standard cubic feet per minute (scfm). Hydrocarbons in the blower effluent air are treated through two 55-gallon drums of activated carbon, connected in series, prior to being discharged to the atmosphere.

# 4.0 CONCLUSIONS

ECS's findings during this report period are summarized as follows:

- Results indicate that residual gasoline related volatile organic compound (VOC) contamination is still present within the surficial and bedrock aquifer.

- The Vermont Groundwater Enforcement Standard (VGES) for at least one petroleum hydrocarbon continue to be exceeded in site monitoring wells MW-3, MW-8, SP-1, SP-2, and SP-3. The gasoline additive methyl tert butyl ether (MTBE) continues to be detected in monitoring wells MW-3, MW-7, MW-8, SP-1, SP-2, and SP-3.

- No groundwater samples were collected from MW-S2 and MW-S3 because a large dumpster was on top of the wells. Monitoring well SP-4 was not sampled because the well was dry.

- Analytical results from the September 2004 site visit indicate that with the exception of MTBE no other petroleum hydrocarbons were detected in the shopping center's main drinking water supply well treatment system samples.

- MTBE continues to be detected in samples collected from the shopping center's main drinking-water supply well's influent, mid-carbon and effluent. Laboratory analytical reports from the 14 September 2004 system effluent sample indicated that concentrations exceeded the Vermont Health Advisory (VHA) of 40 micrograms per liter (µg/L) for MTBE. Water Works, who services the treatment system, was notified verbally of the treatment system break-through on 28 October 2004. It was also discussed with Water Works, that historical sampling results demonstrate that the current treatment system has not been effective at eliminating MTBE. It was suggested the frequency of carbon change out and service of the treatment system should be increased.

- ECS had requested permission to gain access to the Thorne-Thomsen property for the sampling of the treatment system on separate occasions via phone call, but the phone calls were not returned. No one was home at the Thorne-Thomsen residence during the September 2004 site visit, and therefore, the treatment system was not sampled. ECS will attempt to sample the Thorne-Thompsen well again in December 2004 during the quarterly sampling.

- An estimated 29 pounds of gasoline mass were recovered from the subsurface by the AS/SVE System between 16 March 2004 and 14 September 2004, bringing the total gasoline mass recovered since January 1999 to 419 pounds. Estimated mass-recovery rates during this reporting period ranged from 0.087 to 0.226 pounds per day (lbs./day). These data represent a continued decrease in mass removal rate.

- The SVE portion of the system was operational 100 percent of the time during this reporting period. The AS portion of the system was operational approximately 66 percent of the time. The AS/SVE system is currently operational.

- The lack of VOC recovery in the SVE legs 1,2, and 3 and the presence of VOCs in sparge points SP-1 and SP-2 suggests minimal sparge influence in this area of the site.

# 5.0 RECOMMENDATIONS

On the basis of these findings, ECS makes the following recommendations:

1. Groundwater sampling and analysis of all onsite monitoring wells should continue on a semi-annual basis, with the next groundwater monitoring event to take place March 2005.

2. The nearby residential supply wells should continue to be monitored annually, with the next sampling event to be conducted in March 2005. With the exception of the Roger's residence, the sampling list should be reduced to residences located within a 500ft. radius instead of the previously determined list of residences located within 1,000 ft of the Londonderry Citgo., given two years of non-detected petroleum related contaminants. The residences that are within the 500 ft radius of the contaminant source include: Gordon, Rowley, the Second Congregational Church and it's associated "Store", and the Abbott residence.

3. Quarterly sampling of nearby supply well treatment systems of the Thorne-Thompsen residence, and Londonderry Shopping Center should continue, with the next sampling event to be conducted in December 2004. In addition to supply well sampling, the Roger's supply well should be included in this quarterly sampling plan.

4. Remediation system checks and maintenance should continue to be conducted on a monthly basis.

5. Field data should be collected during system checks, such as dissolved oxygen, vacuum, and pressure from existing monitoring points to evaluate sparge and extraction influence. This data will be used to determine if the existing AS/SVE system is affecting residual contaminants within the source area.

6. The supply well treatment system for the Londonderry Shopping Center should be reevaluated and upgraded given historical MTBE contaminant breakthrough.

# TABLES

## TABLE 1. GROUNDWATER ELEVATION CALCULATIONS

Londonderry Citgo
Londonderry, Vermont

Monitoring Date:
14 September 2004

| Well I. D. | Top of Casing Elevation * | Depth to Water (feet, TOC) | Ground Water Elevation |
|---|---|---|---|
| MW-1 | **DESTROYED or PAVED OVER** | | |
| MW-2 | **DESTROYED or PAVED OVER** | | |
| MW-3 | 98.69 | 8.00 | 90.69 |
| MW-4 | **FILLED WITH SEDIMENT** | | |
| MW-5 | 98.48 | 10.44 | 88.04 |
| MW-6 | 95.13 | 9.67 | 85.46 |
| MW-7 | 98.40 | 10.61 | 87.79 |
| MW-8 | 99.66 | 8.29 | 91.37 |
| MW-S1 | **DESTROYED or PAVED OVER** | | |
| MW-S2 | 94.89 | NS | NS |
| MW-S3 | 94.41 | NS | NS |
| SP-1** | 99.07 | 7.53 | 91.54 |
| SP-2** | 99.23 | 8.05 | 91.18 |
| SP-3** | 99.50 | 8.26 | 91.24 |
| SP-4** | 99.64 | NS | NS |

*Top of casing (TOC) and ground water elevations are relative to an arbitrary site datum of 100.00 feet.
**Sparge points (SP) screened below water-table.
MW-1 and MW-2 were destroyed during installation of the new UST system
MW-S1 and were destroyed during snow removal.
MW-5 was not sampled due to change in scope of work.
MW-6 was not located.
NS = Groundwater level counld not be obtained. Well Not Sampled.
MW-S2 was not sampled because a dumpster was on top of it.
MW-S3 was not sampled because of a field oversite.

**TABLE 2. ANALYTICAL MONITORING RESULTS**
**GROUNDWATER MONITORING WELL SAMPLES**

Londonderry Citgo
Londonderry, Vermont

Monitoring Date:
14 September 2004

| Sample Location | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 Trimethyl Benzene | 1,2,4 Trimethyl Benzene | Naphthalene |
|---|---|---|---|---|---|---|---|---|---|
| Volatile Petroleum Hydrocarbons by EPA Method 8021B | | | | | | | | | |
| MW-S2 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| MW-S3 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| MW-3 | ND | **44.6** | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| MW-5 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| MW-6 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| MW-7 | ND | **1.3** | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| MW-8 | **838** | **140** | ND<10.0 | **13.4** | **178** | **647** | **160** | **575** | **93** |
| SP-1 | **118** | **258** | **105** | 13.3 | ND<4.0 | ND<8.0 | ND<4.0 | **7.5** | ND<4.0 |
| SP-2 | **203** | **125** | ND<5.0 | **10.2** | **104** | **88.5** | **25.1** | **200** | **30.2** |
| SP-3 | **32** | **367** | **31.7** | ND<5.0 | ND<5.0 | ND<10.0 | ND<4.0 | **7.2** | ND<5.0 |
| SP-4 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| *VGES* | ***---*** | ***40*** | ***5.0*** | ***1,000*** | ***700*** | ***10,000*** | ***4.0*** | ***5.0*** | ***20*** |
| Quality Assurance/Quality Control Samples by EPA Method 8021B | | | | | | | | | |
| Duplicate (Dup.) | **771** | **142** | **6.8** | **10.4** | **159** | **595** | **148** | **595** | **102** |
| MW-8 | **838** | **140** | ND<10.0 | **13.4** | **178** | **647** | **160** | **575** | **93** |
| % Difference | ***8*** | ***1*** | ***NA*** | ***25*** | ***11*** | ***8*** | ***8*** | ***3*** | ***9*** |
| trip blank | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |

Notes:
All Samples collected by ECS and analyzed by Endyne, Inc. for volatile petroleum hydrocarbons by EPA Method 8021B.
Results given in micrograms per liter (µg/L).
ND - None detected at indicated detection limit.
TBQ - Trace below indicated quantitation limit.
VGES - Vermont Groundwater Enforcement Standards.
Shaded concentrations exceed VGES.
SP-4 was not sampled because well was dry on 9/14/04.
MW-2S was not sampled because well was under a dumpster on 9/14/04.
MW-3S was not sampled due to an oversight in the field on 9/14/04.

**TABLE 3A.**
Drinking-Water Analytical Results
Londonderry Citgo
Londonderry Center, Vermont
Monitoring Date:
16 June 2004

| Supply Well | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | Total BTEX | 1,3,5 -TMB | 1,3,5 -TMB | Naphthalene |
|---|---|---|---|---|---|---|---|---|---|
| Shopping Center Main | | | | | | | | | |
| - system influent | **32.9** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| - system mid | **28.9** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| - system effluent | **4.8** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| Thorne-Thomsen - system influent | **28.7** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| - system mid | **1.2** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| - system effluent | ND <1 | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| Rogers | **19.7** | **1.4** | ND <1 | ND <1 | ND <2 | **1.4** | ND <1 | ND <1 | ND <1 |
| Dup. (Shopping center main influent.) | **33.9** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| - System Influent | **32.9** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| % Difference | ***2.01*** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **--** |
| trip blank | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| MCL | --- | 5 | 1,000 | 700 | 10,000 | --- | --- | --- | --- |
| VHA | 40 | --- | --- | --- | --- | --- | 5 | 4 | 20 |
| VAL | --- | 1 | --- | --- | --- | --- | --- | --- | --- |

Notes:
Results given in parts per billion (ppb).
NS - Not sampled, could not contact owner for access.
ND - None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
MCL - Enforceable U.S. EPA Maximum Contaminant Levels for chemicals of concern in drinking water.
VHA - Vermont Health Advisories - guidelines for concentrations of chemicals in drinking water that do not have MCLs.
VAL - Vermont Action Levels for eight chemicals of specific health concern in public water systems, established by the Vermont Dept. of Health.

**TABLE 3B**
Drinking-Water Analytical Results
Londonderry Citgo
Londonderry Center, Vermont
Monitoring Dates:
11 August 2004 and 14 September 2004

| Supply Well | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | Total BTEX | 1,3,5 -TMB | 1,3,5 -TMB | Naphthalene |
|---|---|---|---|---|---|---|---|---|---|
| Shopping Center Main | | | | | | | | | |
| - system influent | **96.4** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| - system mid | **57.5** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| - system effluent | **53.8** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| Thorne-Thomsen - system influent | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| - system mid | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| - system effluent | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| Rogers* (Sampled 8/11/04) | **13.7** | ND <0.5 | ND <0.5 | ND <0.5 | ND <0.5 | **ND** | ND <0.5 | ND <0.5 | ND <0.5 |
| Dup. †† (Sampled 8/11/04) | **13.7** | ND <1 | ND <1 | ND <1 | ND <2 | **ND** | ND <1 | ND <1 | ND <1 |
| % Difference | ***0.00*** | **--** | **--** | **--** | **--** | **--** | **--** | **--** | **--** |
| Trip blank (Sampled 8/11/04) | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| MCL | --- | 5 | 1,000 | 700 | 10,000 | --- | --- | --- | --- |
| VHA | 40 | --- | --- | --- | --- | --- | 5 | 4 | 20 |
| VAL | --- | 1 | --- | --- | --- | --- | --- | --- | --- |

Notes:

Results given in parts per billion (ppb).

NS - Not sampled, could not contact owner for access.

ND - None detected at indicated detection limit.

All samples collected by ECS and analyzed by Endyne, Inc.

MCL - Enforceable U.S. EPA Maximum Contaminant Levels for chemicals of concern in drinking water.

VHA - Vermont Health Advisories - guidelines for concentrations of chemicals in drinking water that do not have MCLs.

VAL - Vermont Action Levels for eight chemicals of specific health concern in public water systems, established by the Vermont Dept. of Health.

* - Rogers residence supply well was sampled on 8/11/04 and analyzed for VOCs by EPA Method 524.2. Tert-amyl methyl ether was detected at 1.1 µg/L.

†† - Duplicate sample and trip blank for 9/14/04 were collected with the monitoring well group of samples.

## TABLE 4. SPARGE SYSTEM PRESSURE AND AIRFLOW READINGS

| DATE | SP-1 | SP-2 | SP-3 | SP-4 |
|---|---|---|---|---|
| 02/22/00 | 0.5 | 6 | 3 | 5.5 |
| 03/09/00 | 1 | 5 | 4 | 4 |
| 07/17/00 | 6 | 4 | 4.5 | 4.5 |
| 07/26/00 | 4 | 5 | 4.5 | 6 |
| 08/14/00 | 5 | 6.5 | 7 | 5 |
| 09/19/00 | 3 | 5.5 | 5 | 4.5 |
| 02/18/04 | -- | -- | -- | -- |
| 03/08/04 | -- | -- | -- | -- |
| 03/16/04 | -- | -- | -- | -- |
| 04/22/04 | -- | -- | -- | -- |
| 05/11/04 | -- | -- | -- | -- |
| 06/16/04 | 4.5 | 6.0 | 4.5 | 4.5 |
| 07/06/04 | 5.0 | 5.0 | 5.0 | 4.0 |
| 08/11/04 | 3.5 | 6.5 | 3.5 | 5 |
| 09/14/04 | 1 | 5 | 1 | 4 |

Note: Readings in pounds per square inch (psi).
N/A: Data not available
--: Sparge leg not running

| DATE | SP-1 | SP-2 | SP-3 | SP-4 |
|---|---|---|---|---|
| 02/22/00 | 12.5 | 9.5 | 10 | 9 |
| 03/09/00 | 12.5 | 9.75 | 9 | 10 |
| 07/17/00 | 8.0 | 10.5 | 9.0 | 9.5 |
| 07/26/00 | 13 | 12 | 10.5 | 10 |
| 08/14/00 | 11 | 17 | 11 | 6 |
| 09/19/00 | 11.5 | 22 | 17 | 7 |
| 02/18/04 | -- | -- | -- | -- |
| 03/08/04 | -- | -- | -- | -- |
| 03/16/04 | -- | -- | -- | -- |
| 04/22/04 | -- | -- | -- | -- |
| 05/11/04 | -- | -- | -- | -- |
| 06/16/04 | 15 | 16 | 7.5 | 5 |
| 07/06/04 | 5 | 5 | 5 | 4 |
| 08/11/04 | 10 | 14 | 10 | 8 |
| 09/14/04 | 9.5 | 15 | 11.5 | 7.5 |

Note: Readings in standard cubic feet per minute (scfm).
N/A= Data not available
--: Sparge leg not running

## TABLE 5. SVE SYSTEM PID READINGS

| DATE | SVE-1 | SVE-2 | SVE-3 | SVE-4 | SVE-5 | Total |
|---|---|---|---|---|---|---|
| 11/19/99 | 3.2 | 16.2 | 0.7 | 6.1 | 1.2 | 5.8 |
| 12/03/99 | 6.5 | 4.9 | 9.8 | 5.5 | 4.1 | 2.5 |
| 12/14/99 | 4.5 | 6.2 | 1.8 | 6.8 | 2.2 | 4.2 |
| 01/19/00 | 1.5 | 24.2 | 0.0 | 1.5 | 0.1 | 1.6 |
| 02/22/00 | 0.7 | 0.0 | 0.5 | 0.7 | 0.5 | -- |
| 03/09/00 | -- | 6.3 | -- | 4.1 | -- | -- |
| 07/17/00 | 0.1 | 0.9 | 0.2 | 1.7 | 0.9 | 2.8 |
| 07/26/00 | 10.4 | 4.3 | 13.8 | 2.0 | 0.0 | 0.0 |
| 08/14/00 | 0.3 | 0.4 | 15.1 | 2.8 | 6.8 | 5.4 |
| 09/19/00 | 6.1 | 4.0 | 4.2 | 3.0 | 5.0 | 2.1 |
| 02/18/04 | 65.0 | 76.6 | 79.7 | 595.0 | 437.0 | 117.0 |
| 03/08/04 | 0.2 | 23.8 | 0.2 | 51.6 | 18.4 | 13.2 |
| 03/16/04 | 0 | 5.5 | 0.1 | 69.4 | 27.5 | 15.6 |
| 04/22/04 | 0 | 0 | 0 | 8.0 | 16.0 | 11.0 |
| 05/11/04 | 0 | 0 | 1.3 | 22.7 | 29.0 | 18.3 |
| 06/16/04 | 9.7 | 23.6 | 8.3 | 1.3 | 11.1 | 4.1 |
| 07/06/04 | 0 | 0.4 | 0 | 21.2 | 1.5 | 5.2 |
| 08/11/04 | 0 | 3.3 | 3.3 | 30.2 | 0.6 | 8.8 |
| 09/14/04 | 0 | 0 | 0 | 20.1 | 3.1 | 8.0 |

Notes: Readings in parts per million (ppm) by photoionization detector
System readings are prior to dilution.
N/A= Data not available
--: SVE leg not running

## TABLE 6. SVE SYSTEM VACUUM READINGS

| DATE | SVE-1 | SVE-2 | SVE-3 | SVE-4 | SVE-5 | TOTAL |
|---|---|---|---|---|---|---|
| 02/10/99 | --- | --- | --- | --- | --- | --- |
| 12/14/99 | 2.0 | 1.0 | 1.0 | 3.0 | 1.0 | N/A |
| 01/19/00 | 1.75 | 1.5 | 1.0 | 3.0 | 1.0 | N/A |
| 02/22/00 | 1.5 | 1.0 | 1.0 | 3.0 | 1.0 | 48.5 |
| 03/09/00 | 2.0 | 1.5 | 1.5 | 4.0 | 1.0 | -- |
| 07/17/00 | 1.2 | 1.2 | 1.0 | 1.6 | 1.0 | 17 |
| 07/26/00 | 1.2 | 1.3 | 1.1 | 1.0 | 1.6 | 13.5 |
| 08/14/00 | 1.7 | 1.8 | 1.6 | 2.1 | 1.7 | 17 |
| 09/19/00 | 1.3 | 1.4 | 1.2 | 1.9 | 1.5 | 7.2 |
| 02/18/04 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 03/08/04 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.9 |
| 03/16/04 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 1.0 |
| 04/22/04 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 05/11/04 | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.6 |
| 06/16/04 | 2.0 | 0.3 | 0.2 | 1.0 | 0.1 | 0.4 |
| 07/06/04 | 1.0 | 0.8 | 1.0 | 1.4 | 1.0 | 2.2 |
| 08/11/04 | 1.3 | 1.6 | 1.4 | 1.4 | 2.0 | 2.1 |
| 09/14/04 | 1.0 | 0.9 | 1.0 | 1.4 | 1.1 | 2.4 |

Note: ---: SVE leg not running
N/A= Data not available
All vacuum readings reported as inches of water column

## TABLE 7. SVE SYSTEM VOC DESTRUCTION EFFICIENCY

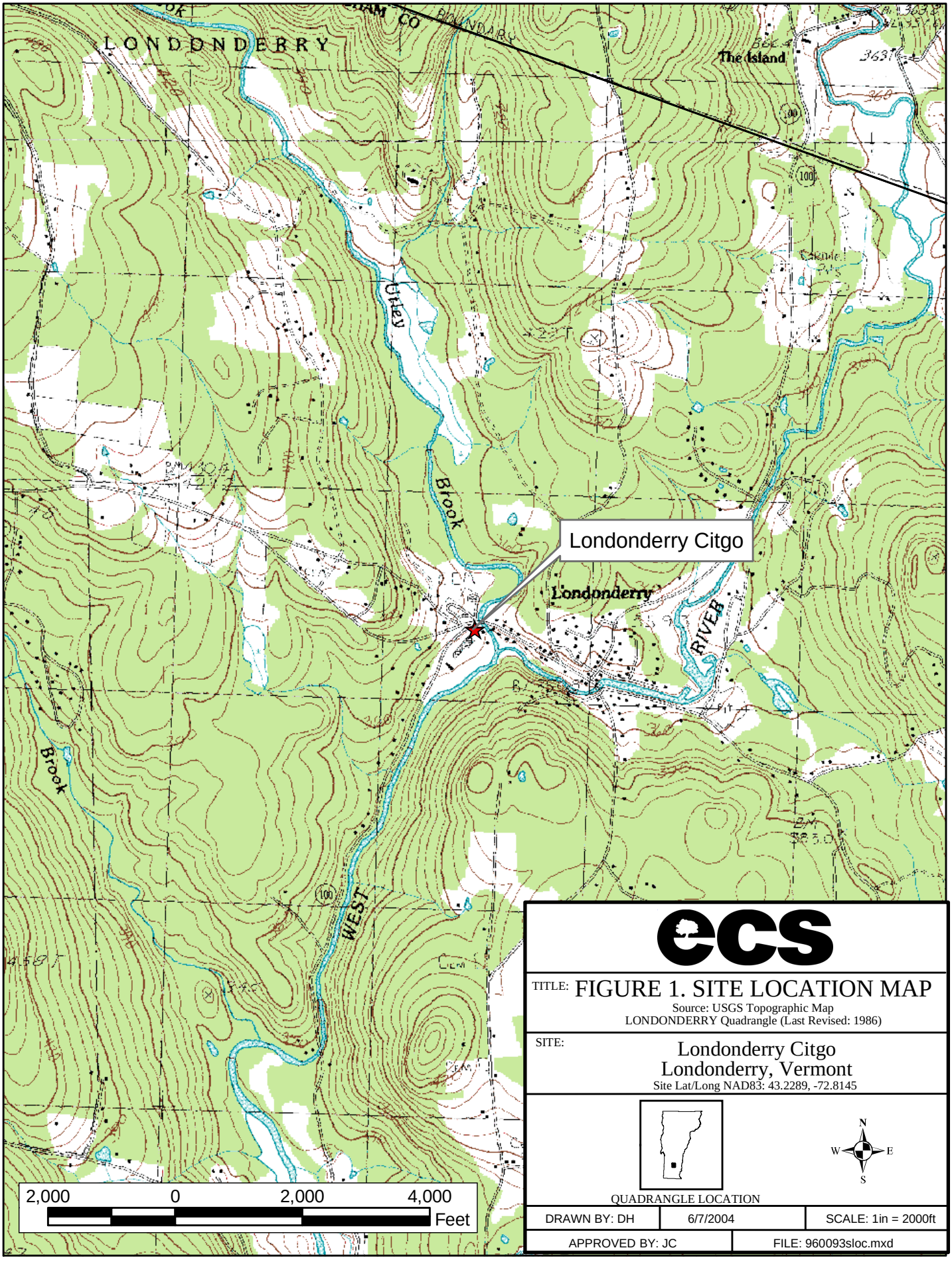
| DATE | INFL | EFF | REMOVAL (%) | |
|---|---|---|---|---|
| 02/22/00 | 4.4 | 1.3 | 70.5 | |
| 03/09/00 | 7.1 | 0 | 100 | |
| 07/17/00 | 1.3 | 0.2 | 85 | |
| 07/26/00 | 0 | 0 | 100 | |
| 08/14/00 | 4.5 | 1.2 | 64 | |
| 09/19/00 | 1.9 | 1 | 48 | |
| 02/18/04 | 117 | 3 | 97 | |
| 03/08/04 | 4.6 | 4.2 | 91 | |
| 03/16/04 | 3.1 | 3.1 | 0 | |
| 04/22/04 | 3.1 | 4.5 | -45 | |
| 05/11/04 | NA | NA | NA | **back pressure** |
| 06/16/04 | 4.1 | 0 | 100 | |
| 07/06/04 | 5.2 | 7.1 | -37 | |
| 08/11/04 | 7.8 | 10.5 | -35 | |
| 09/14/04 | 3.7 | 6.8 | -84 | |

## TABLE 8. SVE SYSTEM AIRFLOW READINGS

| DATE | SVE-1 | SVE-2 | SVE-3 | SVE-4 | SVE-5 | C-1 INFL |
|---|---|---|---|---|---|---|
| 12/03/99 | 5.3 | 2.6 | 7.5 | 31.7 | 8.4 | 0.0 |
| 12/14/99 | 11.1 | 4.4 | 5.4 | 40.4 | 7.5 | 0.0 |
| 01/19/00 | 19.0 | 2.9 | 10.9 | 44.9 | 11.8 | 0.0 |
| 02/22/00 | N/A | N/A | N/A | N/A | N/A | N/A |
| 03/09/00 | 33.4 | 14.8 | 18.2 | 75.5 | 24.9 | 104 |
| 07/17/00 | 15.9 | 15.2 | 27.2 | 55.3 | 48.1 | 123.2 |
| 07/26/00 | 12.0 | 12.9 | 21.3 | 36.0 | 39.2 | 109.0 |
| 08/14/00 | 1.5 | 1.5 | 11.7 | 44.1 | 52.1 | 93.4 |
| 09/19/00 | 10.3 | 10.2 | 19.8 | 33.6 | 37.3 | 88.0 |
| 02/18/04 | 1.3 | 0.9 | 4.5 | 0.2 | 9.7 | 48.60 |
| 03/08/04 | 1.5 | 1.5 | 5.3 | 0.1 | 9.7 | 41.0 |
| 03/16/04 | 1.8 | 1.7 | 4.7 | 0.2 | 9.7 | 42.8 |
| 04/22/04 | 0.5 | 0.5 | 0.5 | 0.5 | 12.0 | 48.6 |
| 05/11/04 | 12.6 | 10.7 | 17.5 | 33.0 | 33.0 | 40.0 |
| 06/16/04 | 15.0 | 12.2 | 18.4 | 0.6 | 27.5 | 37.3 |
| 07/06/04 | 8.7 | 8.2 | 15.6 | 19.4 | 34.0 | 77.6 |
| 08/11/04 | 7.8 | 7.8 | 14.6 | 24.3 | 29.1 | 77.6 |
| 09/14/04 | 9.7 | 4.9 | 17.5 | 24.3 | 34.1 | 87.3 |

Notes: Flow rates reported in cubic feet per minute (cfm)
System readings are prior to dilution.
--- SVE leg not running
N/A Data not available

# FIGURES




ecs

TITLE: FIGURE 1. SITE LOCATION MAP

Source: USGS Topographic Map
LONDONDERRY Quadrangle (Last Revised: 1986)

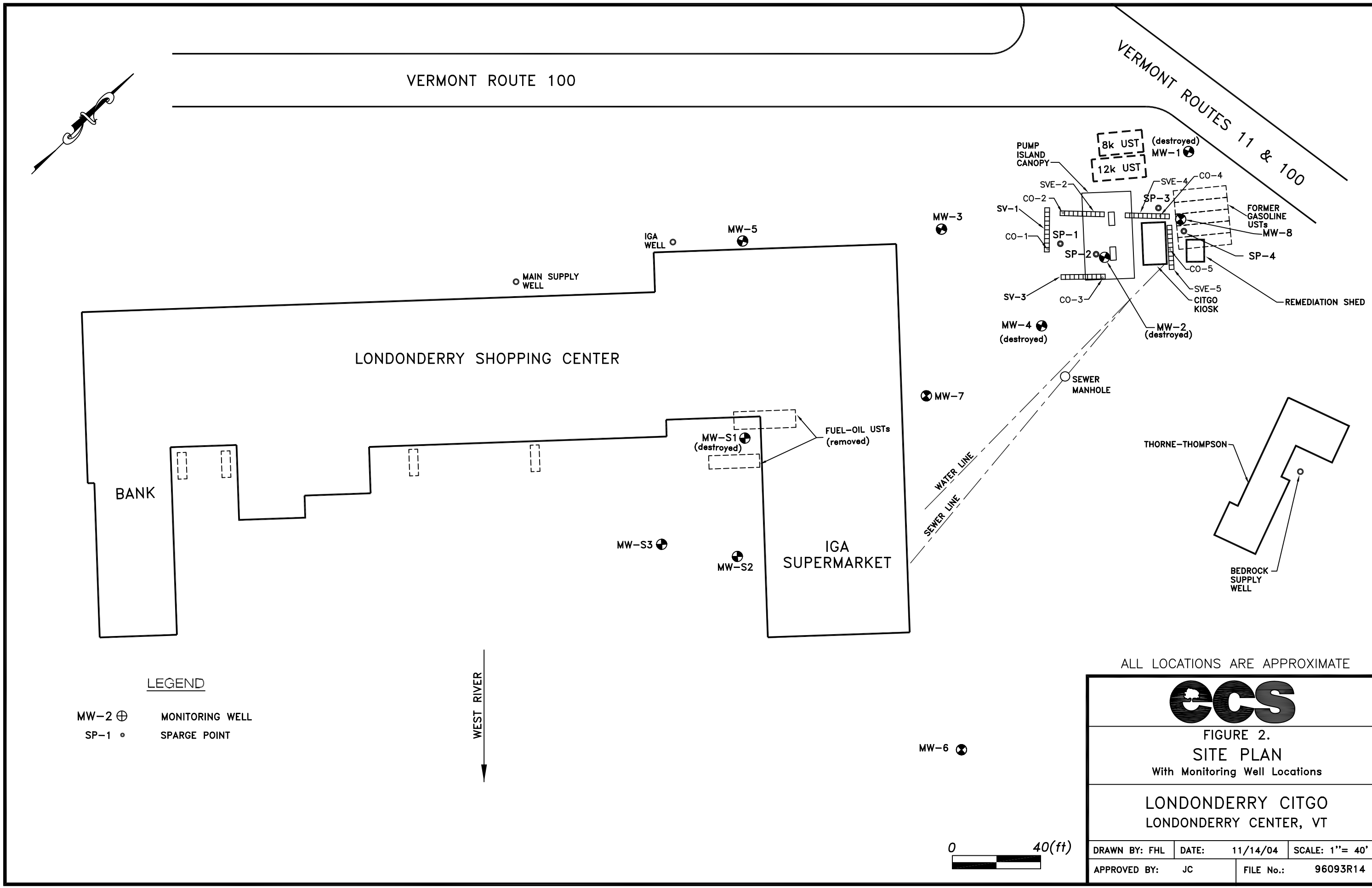
SITE:

Londonderry Citgo
Londonderry, Vermont
Site Lat/Long NAD83: 43.2289, -72.8145

QUADRANGLE LOCATION

N
W E
S

| | | |
|---|---|---|
| DRAWN BY: DH | 6/7/2004 | SCALE: 1in = 2000ft |
| APPROVED BY: JC | | FILE: 960093sloc.mxd |




ALL LOCATIONS ARE APPROXIMATE

ecs

FIGURE 2.

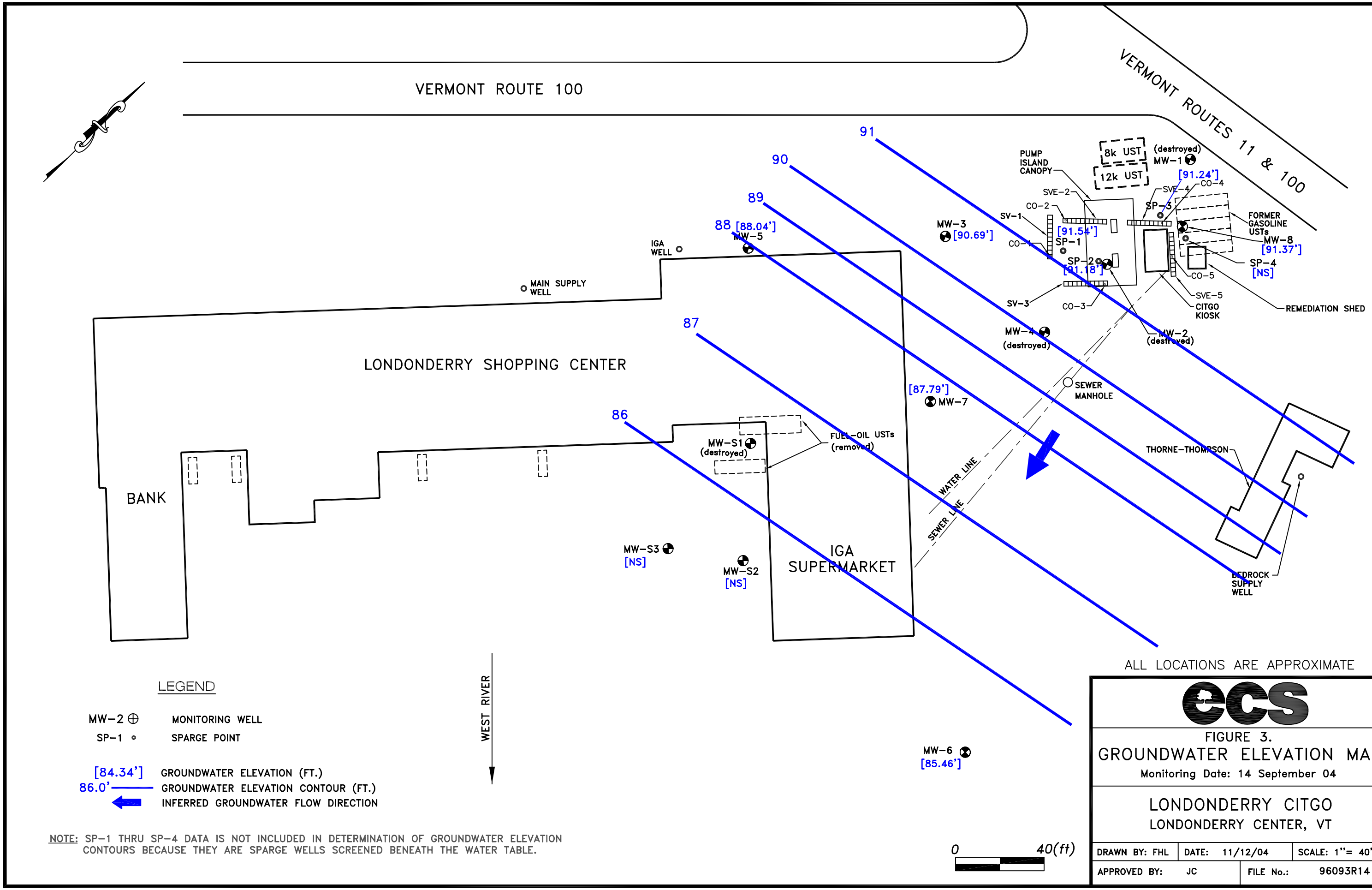
SITE PLAN

With Monitoring Well Locations

LONDONDERRY CITGO

LONDONDERRY CENTER, VT

| | | |
|---|---|---|
| DRAWN BY: FHL | DATE: 11/14/04 | SCALE: 1"= 40' |
| APPROVED BY: JC | FILE No.: 96093R14 | |




NOTE: SP-1 THRU SP-4 DATA IS NOT INCLUDED IN DETERMINATION OF GROUNDWATER ELEVATION CONTOURS BECAUSE THEY ARE SPARGE WELLS SCREENED BENEATH THE WATER TABLE.

ALL LOCATIONS ARE APPROXIMATE

ecs

FIGURE 3.

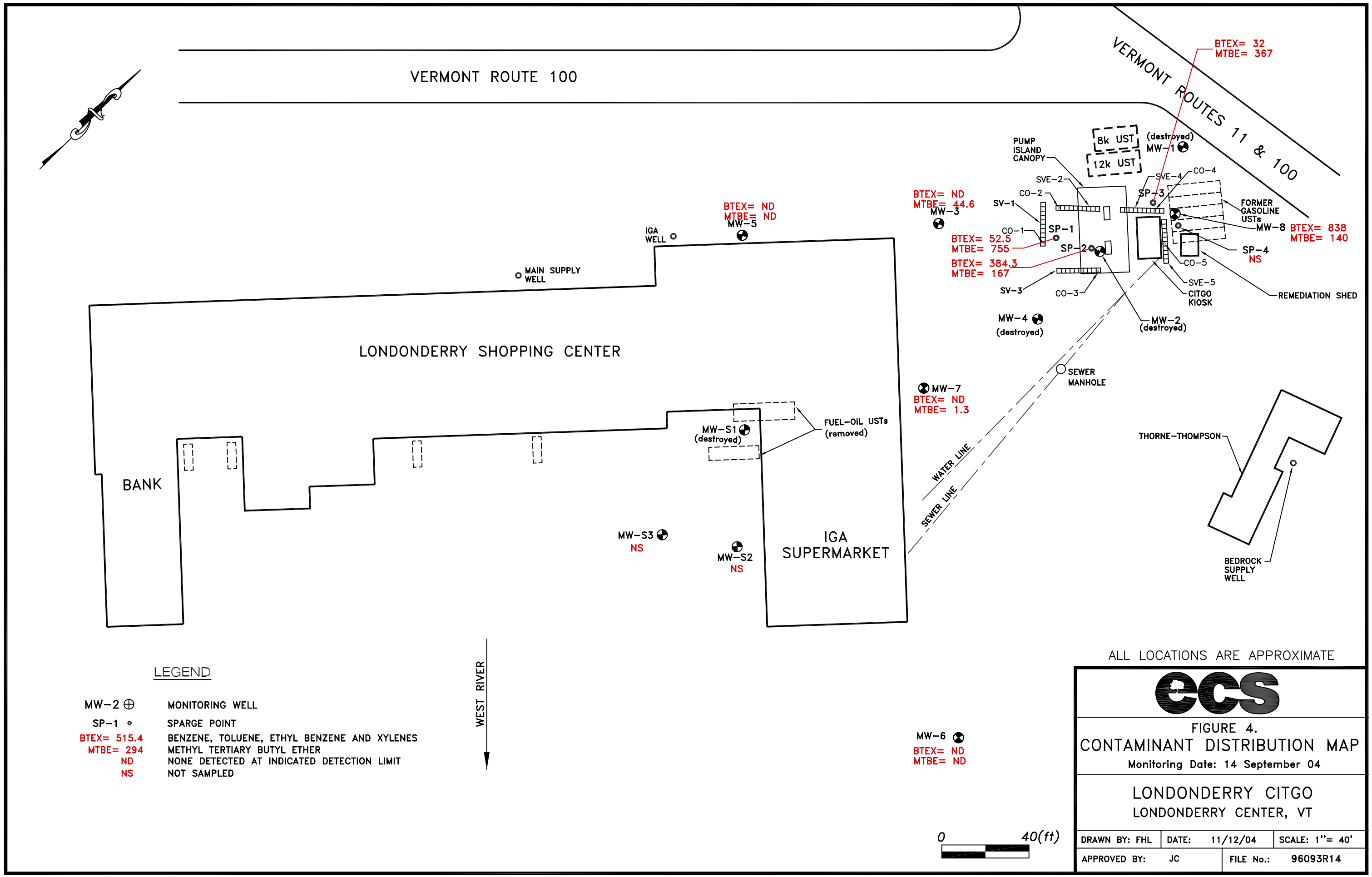
# GROUNDWATER ELEVATION MAP

Monitoring Date: 14 September 04

## LONDONDERRY CITGO

LONDONDERRY CENTER, VT

| | | |
|---|---|---|
| DRAWN BY: FHL | DATE: 11/12/04 | SCALE: 1"= 40' |
| APPROVED BY: JC | FILE No.: 96093R14 | |




LEGEND

| | |
|---|---|
| MW-2 ⊕ | MONITORING WELL |
| SP-1 ∘ | SPARGE POINT |
| BTEX= 515.4 | BENZENE, TOLUENE, ETHYL BENZENE AND XYLENES |
| MTBE= 294 | METHYL TERTIARY BUTYL ETHER |
| ND | NONE DETECTED AT INDICATED DETECTION LIMIT |
| NS | NOT SAMPLED |

ALL LOCATIONS ARE APPROXIMATE

ecs

FIGURE 4.

# CONTAMINANT DISTRIBUTION MAP

Monitoring Date: 14 September 04

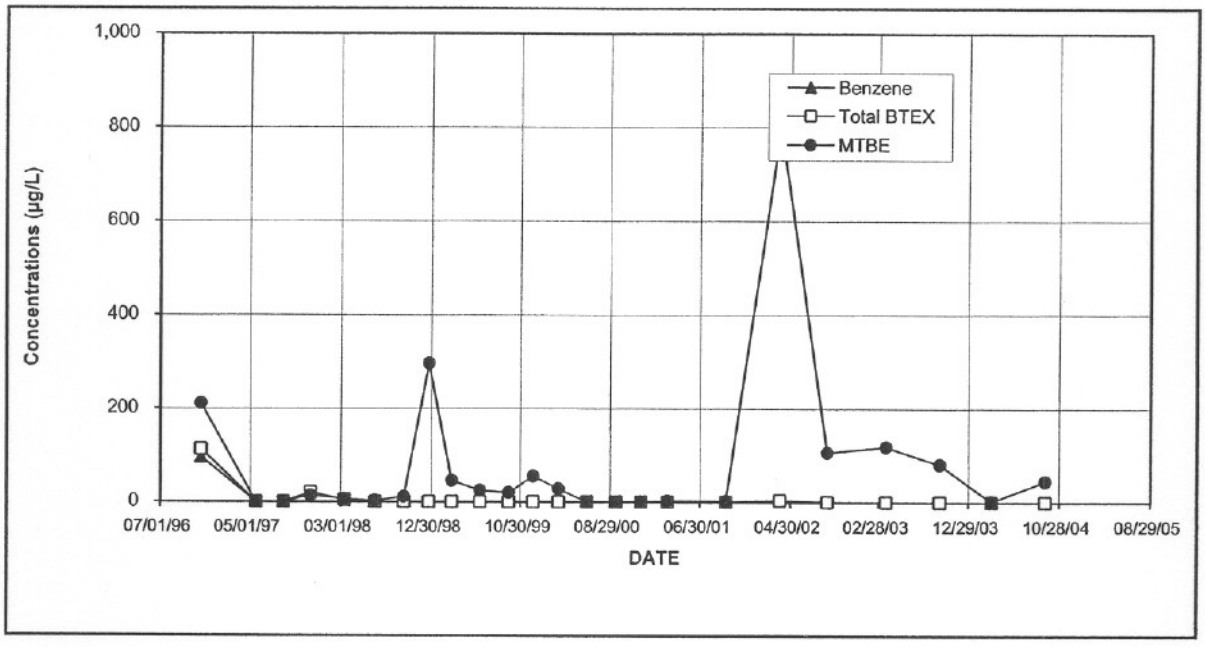
## LONDONDERRY CITGO

LONDONDERRY CENTER, VT

| | | |
|---|---|---|
| DRAWN BY: FHL | DATE: 11/12/04 | SCALE: 1"= 40' |
| APPROVED BY: JC | | FILE No.: 96093R14 |

## FIGURE 5. MW-3
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

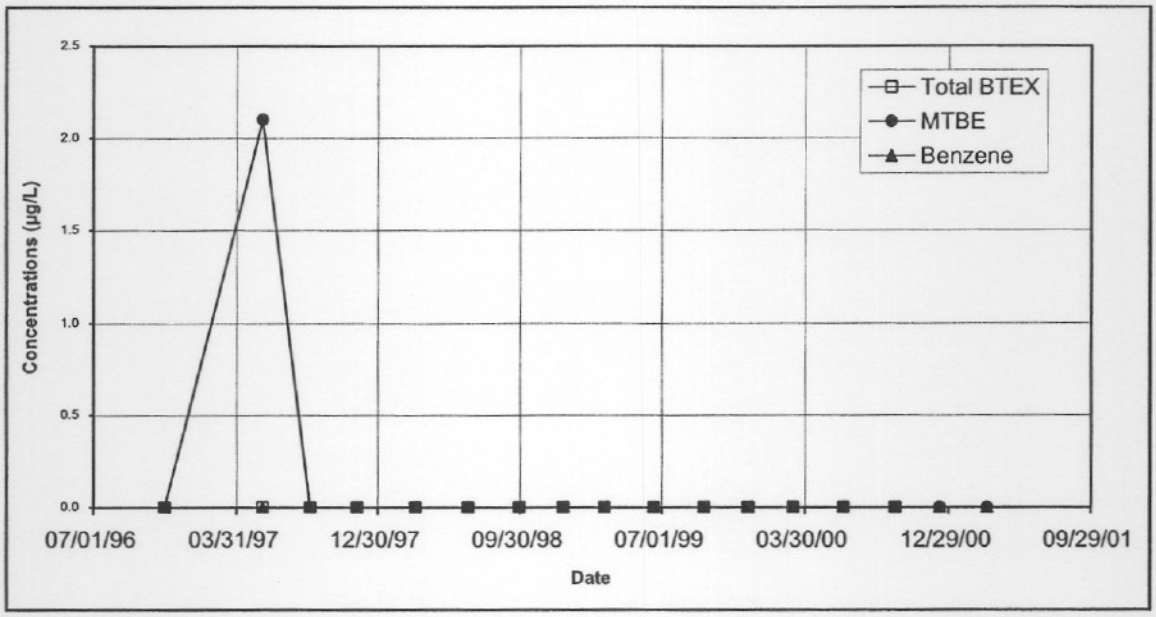



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 03/08/00 | ND | **27.9** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 06/12/00 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/19/00 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 12/13/00 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/13/01 | ND | **1.7** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/25/01 | ND | **1.83** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/26/02 | **3.2** | **798** | **3.2** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/05/02 | ND | **106** | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/27/03 | ND | **118** | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/25/03 | ND | **80.2** | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/16/04 | ND | **1.5** | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/14/04 | ND | **44.6** | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| **VGES** | **---** | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes: Results given in micrograms per liter (µg/L)
ND - None detected at indicated detection limit
TBQ- Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
Shaded concentrations exceed VGES.

## FIGURE 9. MW-5
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

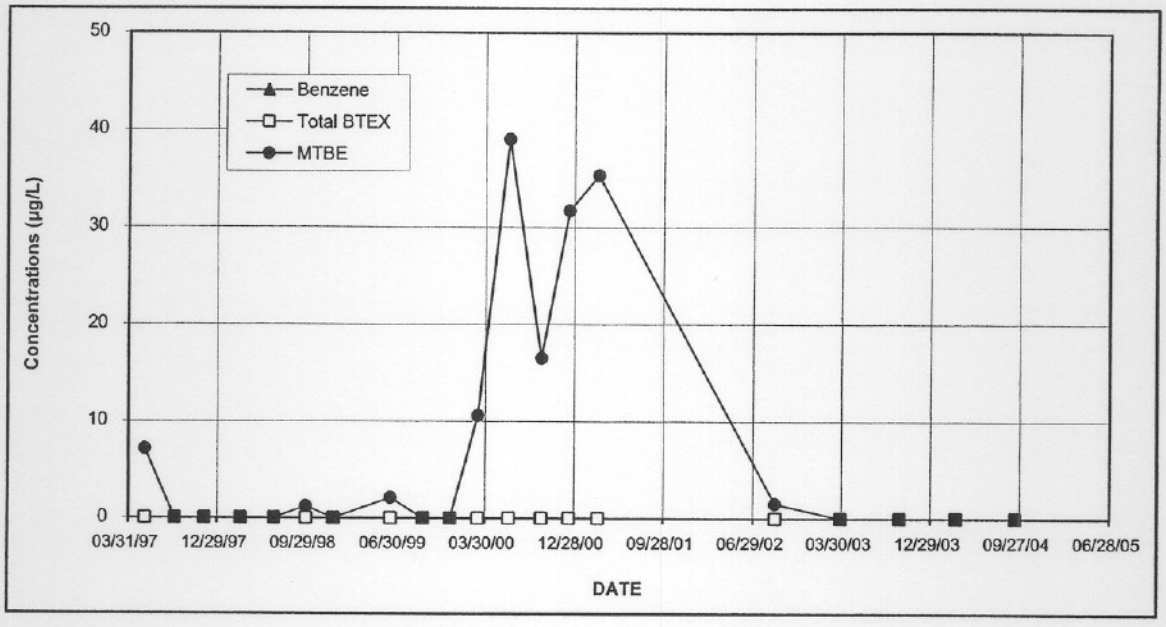



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 03/08/00 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 06/12/00 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/19/00 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 12/13/00 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/13/01 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/25/01 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 03/26/02 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 09/05/02 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 03/27/03 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 09/25/03 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 03/16/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 09/14/04 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| **VGES** | **---** | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes: Results given in micrograms per liter (µg/L)
ND - None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
* Well installed 14 May 1997
** MW-5 Not sampled due to change in scope of work. Added back to sampling plan

## FIGURE 6. MW-6
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

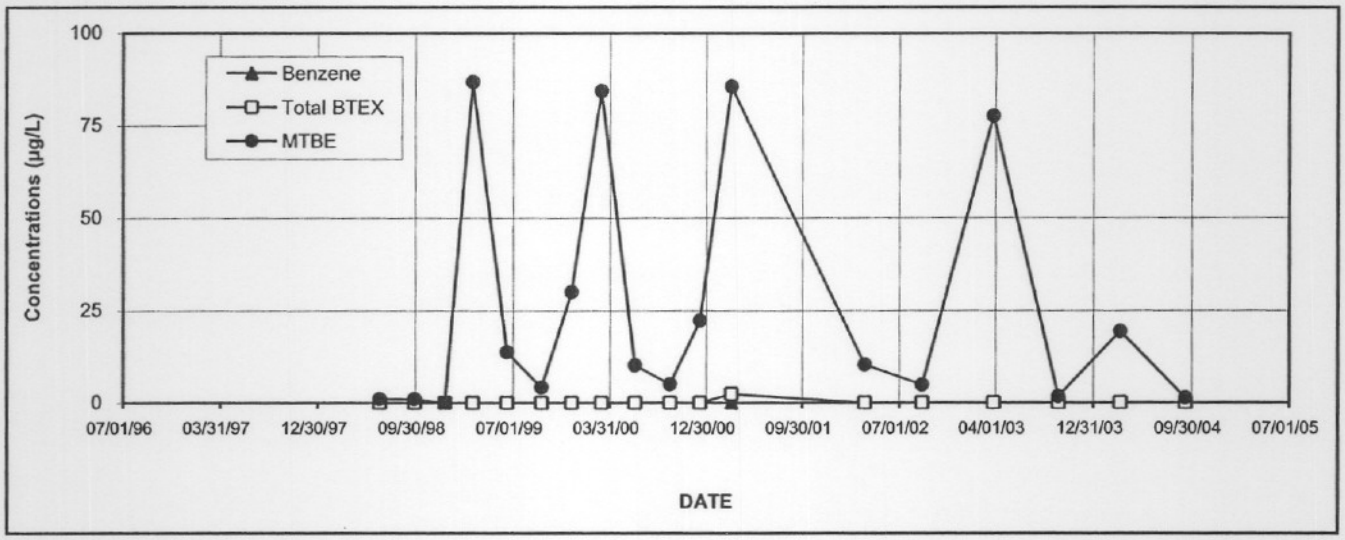



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 03/08/00 | ND | **10.6** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 06/12/00 | ND | **39.0** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/19/00 | ND | **16.5** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 12/13/00 | ND | **31.7** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/13/01 | ND | **35.3** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/05/02 | ND | **1.5** | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/27/03 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 09/25/03 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/16/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 09/14/04 | ND | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| **VGES** | **---** | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes: Results given in micrograms per liter (µg/L)
ND - None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
* Well installed 14 May 1997
** MW-6 not located.
NS- Unable to locate the well due to excessive snow stock piled from plowing, therefore not sam

## FIGURE 7. MW-7
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

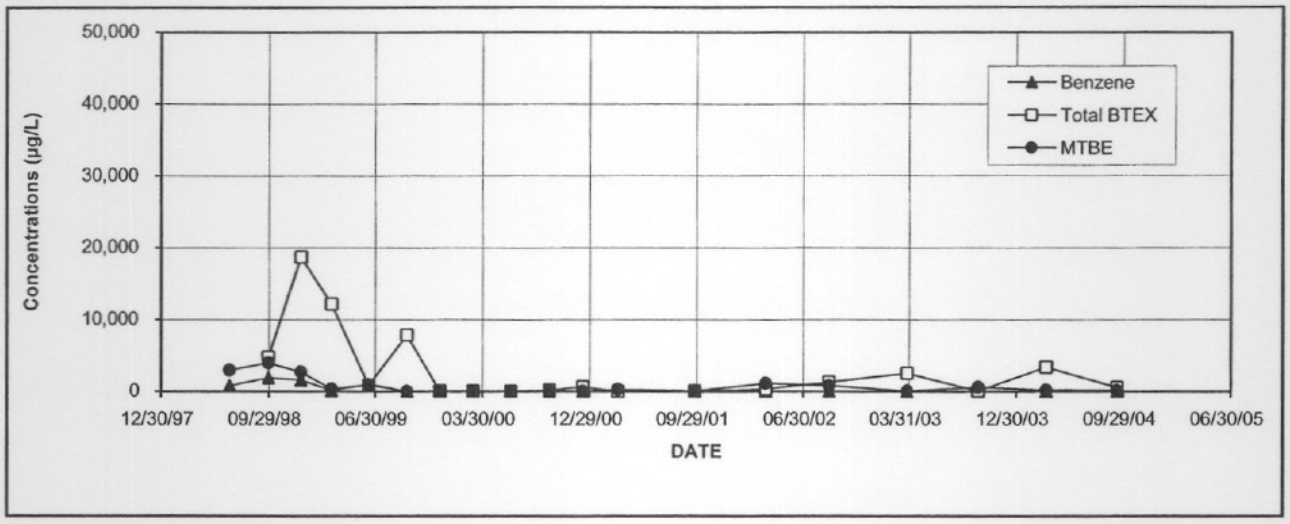



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 03/08/00 | ND | 84.3 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND<1.0 |
| 06/12/00 | ND | 10.2 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND<1.0 |
| 09/19/00 | ND | 5.1 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND<1.0 |
| 12/13/00 | ND | 22.3 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND<1.0 |
| 03/13/01 | 2.4 | 85.5 | ND<1.0 | ND<1.0 | ND<1.0 | 2.4 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/26/02 | ND | 10.4 | ND<1.0 | ND<1.0 | ND<1.0 | ND <1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/05/02 | ND | 4.9 | ND<1.0 | ND<1.0 | ND<1.0 | ND <2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/27/03 | ND | 77.5 | ND<1.0 | ND<1.0 | ND<1.0 | ND <2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/25/03 | ND | 1.72 | ND<1.0 | ND<1.0 | ND<1.0 | ND <2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/16/04 | ND | 19.4 | ND<1.0 | ND<1.0 | ND<1.0 | ND <2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 09/14/04 | ND | 1.3 | ND<1.0 | ND<1.0 | ND<1.0 | ND <2.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| **VGES** | --- | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes:
Results given in micrograms per liter (µg/L)
ND - None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
* Well installed 23 April 1998
**MW-7 not sampled because it was damaged.

## FIGURE 8. MW-8
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

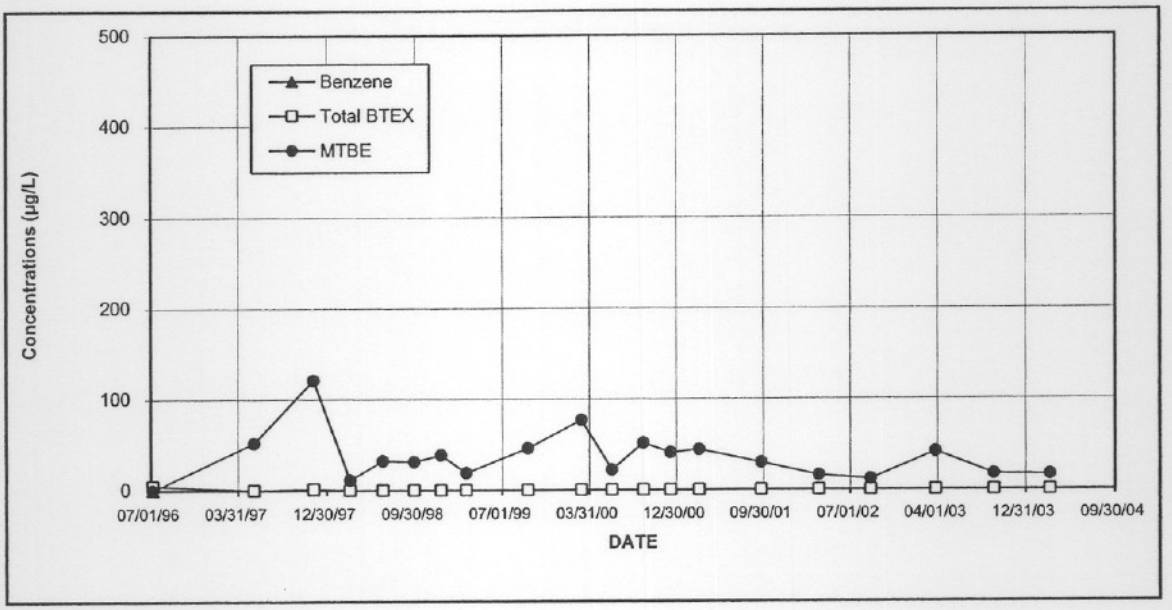



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 03/08/00 | ND | 1.2 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 06/12/00 | 188.2 | 53.1 | 10.2 | 7.9 | 31.1 | 139 | 37.9 | 46.8 | 10.9 |
| 09/19/00 | 625.8 | 24.4 | 10.8 | 117 | 129 | 369 | 31.5 | 103 | 19.0 |
| 12/13/00 | ND | 24.7 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND<1.0 |
| 03/13/01 | 44.5 | 264 | 5.9 | ND<2.0 | 18.6 | 20.0 | 10.6 | 12.3 | 4.2 |
| 09/25/01 | 295.4 | 68.1 | 4.3 | 15.1 | 116 | 160 | 32.5 | 92.1 | 18.8 |
| 03/26/02 | 1,294.3 | 1,080 | 11.2 | 35.1 | 178 | 1,070 | 180 | 422 | 146 |
| 09/05/02 | 2,514.2 | 814 | 20.2 | 206.0 | 588 | 1,700 | 222 | 696 | 153 |
| 03/27/03 | 55.2 | 38.4 | 1.0 | 1.7 | 5.9 | 46.6 | 8.0 | 16.2 | 4.1 |
| 09/25/03 | 3,362.0 | 556 | ND<25.0 | 116 | 824 | 2,422 | 581 | 1,690 | 376 |
| 03/16/04 | 540.5 | 178 | 12.6 | 16.9 | 217 | 294 | 184 | 360 | 77.2 |
| 09/14/04 | 838.4 | 140 | ND<10.0 | 13.4 | 178 | 647 | 160 | 575 | 93.2 |
| **VGES** | --- | 40 | 5 | 1,000 | 700 | 10,000 | 4 | 5 | 20 |

Notes:
Results given in micrograms per liter (µg/L)
ND- None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
* Well installed 23 April 1998
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
Shaded concentrations exceed VGES.

## FIGURE 9. MW-S2
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

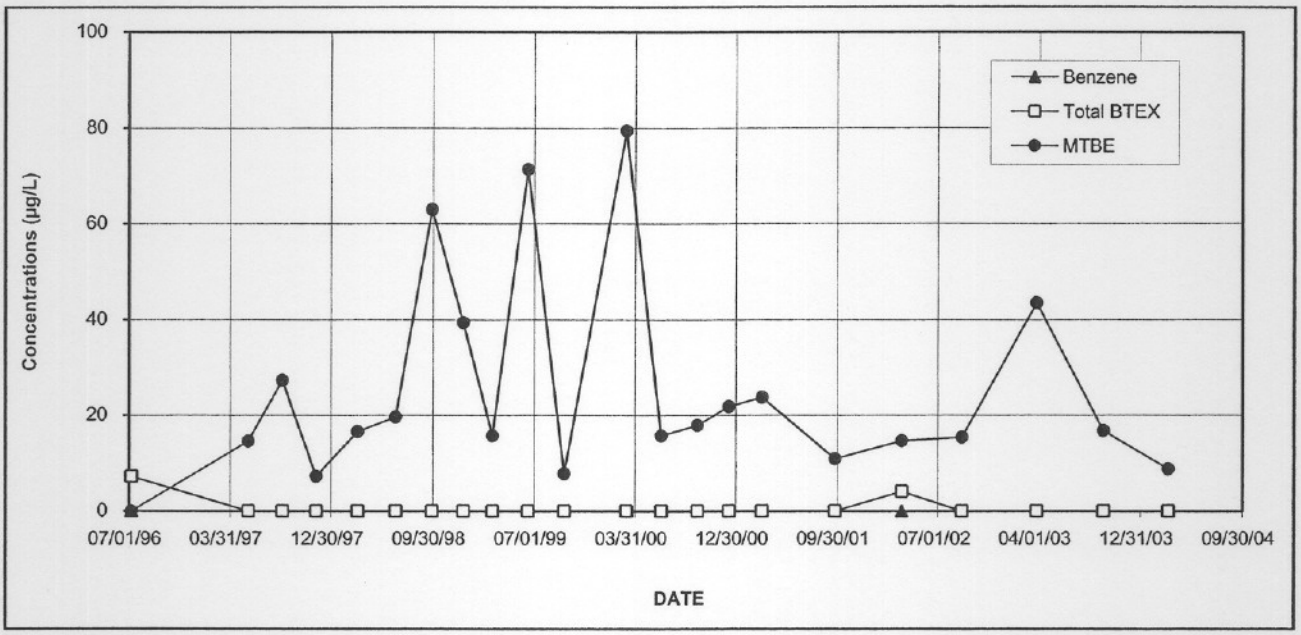



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 03/08/00 | ND | 76.8 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 06/12/00 | ND | 22.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 09/19/00 | ND | 51.3 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 12/13/00 | ND | 40.7 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 03/13/01 | ND | 43.9 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 09/25/01 | ND | 29.6 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 03/26/02 | ND | 15.6 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 09/05/02 | ND | 11.6 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 03/27/03 | ND | 41.6 | ND <1.0 | ND <1.0 | ND <1.0 | ND <2.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 09/25/03 | ND | 17.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <2.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 03/16/04 | ND | 16.5 | ND <1.0 | ND <1.0 | ND <1.0 | ND <2.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 09/14/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| **VGES** | --- | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes:
Results given in micrograms per liter (µg/L)
ND- None detected at indicated detection limit.
TBQ - Trace below quantitaion limit indicated
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
Shaded concentrations exceed VGES.
Unable to be located during Dec '99 site visit

## FIGURE 10. MW-S3
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

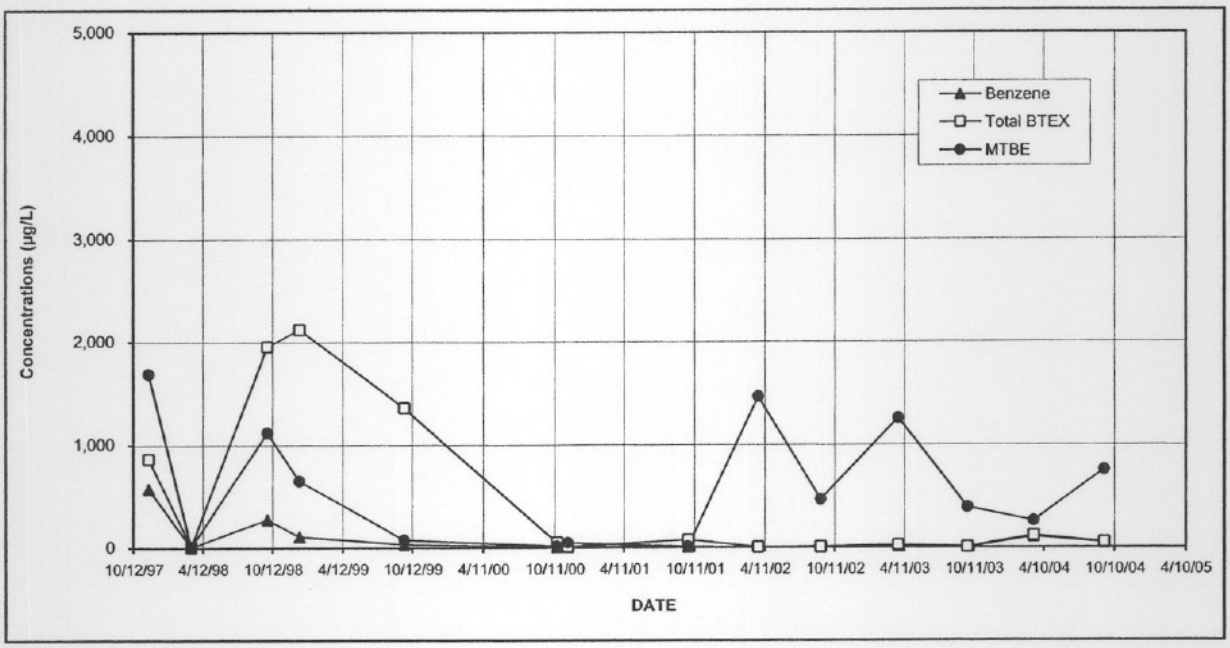



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naphthalene |
|---|---|---|---|---|---|---|---|---|---|
| 03/08/00 | ND | **79.4** | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 06/12/00 | ND | **15.7** | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 09/19/00 | ND | **17.9** | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 12/13/00 | ND | **21.8** | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 | ND <1.0 |
| 03/13/01 | ND | **23.7** | ND <1.0 | ND <1.0 | ND <1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND <1.0 |
| 09/25/01 | ND | **10.9** | ND <1.0 | ND <1.0 | ND <1.0 | ND<1.0 | ND<1.0 | ND<1.0 | ND <1.0 |
| 03/26/02 | **4.1** | **14.7** | ND <1.0 | ND <1.0 | **1.3** | **2.8** | ND<1.0 | ND<1.0 | ND <1.0 |
| 09/05/02 | ND | **15.4** | ND <1.0 | ND <1.0 | ND <1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND <1.0 |
| 03/27/03 | ND | **43.5** | ND <1.0 | ND <1.0 | ND <1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND <1.0 |
| 09/25/03 | ND | **16.8** | ND <1.0 | ND <1.0 | ND <1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND <1.0 |
| 03/16/04 | ND | **8.8** | ND <1.0 | ND <1.0 | ND <1.0 | ND<2.0 | ND<1.0 | ND<1.0 | ND <1.0 |
| 09/14/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| **VGES** | **---** | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes:
Results given in micrograms per liter (µg/L)
ND- None detected at indicated detection limit.
TBQ - Trace below quantitaion limit indicated
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
Shaded concentrations exceed VGES.
Unable to be located during Dec '99 site visit

## FIGURE 11. SP-1
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

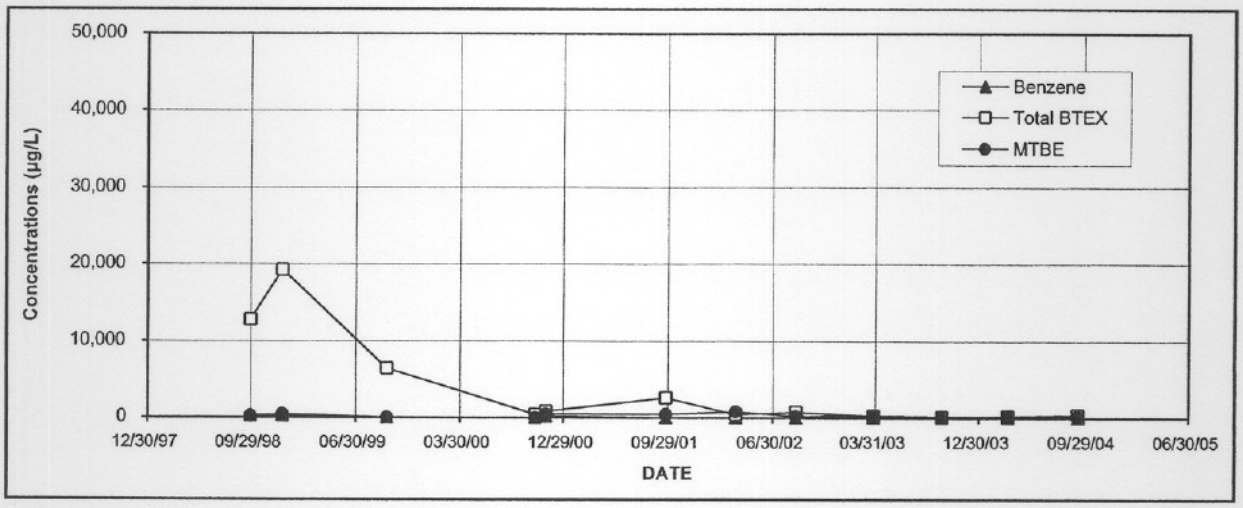



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 11/21/97 | 863.9 | 1,690 | 575 | 121 | 93.5 | 74.4 | --- | --- | --- |
| 03/13/98 | 11.9 | 4.7 | 6.9 | 1.6 | 3.4 | TBQ<1 | --- | --- | --- |
| 09/29/98 | 1,954 | 1,120 | 278 | 129 | 1,000 | 547 | 227 | 384 | 247 |
| 12/22/98 | 2,121 | 651 | 111 | 163 | 966 | 881 | 400 | 1,020 | 155 |
| 09/21/99 | 1,361 | 77 | 35.3 | 60.8 | 474 | 791 | 323 | 620 | 58 |
| 10/17/00 | 53.8 | 18 | 10.0 | 1.5 | 31.3 | 11.0 | 25.7 | 90.7 | 9.5 |
| 11/14/00 | 11.9 | 47.9 | 9.3 | ND<1.0 | 2.6 | ND<1.0 | 1.3 | 3.7 | 4.5 |
| 09/25/01 | 77.8 | 11.8 | 9.6 | 3.1 | 37.1 | 28.0 | 24.3 | 72.2 | 5.2 |
| 03/26/02 | 6.2 | 1,470 | 6.2 | ND <2.0 | ND <2.0 | ND <2.0 | ND <2.0 | ND <2.0 | ND <2.0 |
| 09/05/02 | 10.3 | 467 | 5.1 | ND <4.0 | 5.2 | ND <8.0 | ND <4.0 | ND <4.0 | ND <4.0 |
| 03/27/03 | 24.0 | 1,260 | 14.0 | 5.2 | 4.8 | ND<8.0 | 5.8 | 13.1 | ND<4.0 |
| 09/25/03 | 6.4 | 392 | ND<5.0 | ND<5.0 | 6.4 | ND<10.0 | ND<5.0 | ND<5.0 | 7.4 |
| 03/16/04 | 118.3 | 258 | 105 | 13.3 | ND <4.0 | ND <8.0 | ND <4.0 | 7.5 | ND <4.0 |
| 09/14/04 | 52.5 | 755 | 45.8 | ND<5.0 | 6.7 | ND<10.0 | ND<5.0 | 5.3 | 6.4 |
| VGES | --- | 40 | 5 | 1,000 | 700 | 10,000 | 4 | 5 | 20 |

Notes:
Results given in micrograms per liter (µg/L).
ND- None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
6/23/98 and 3/9/00 - Not Sampled
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - methyl tertiary butyl ether
TMB - Trimethyl Benzene
Shaded concentrations denote VGES exceedences

## FIGURE 12. SP-2
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

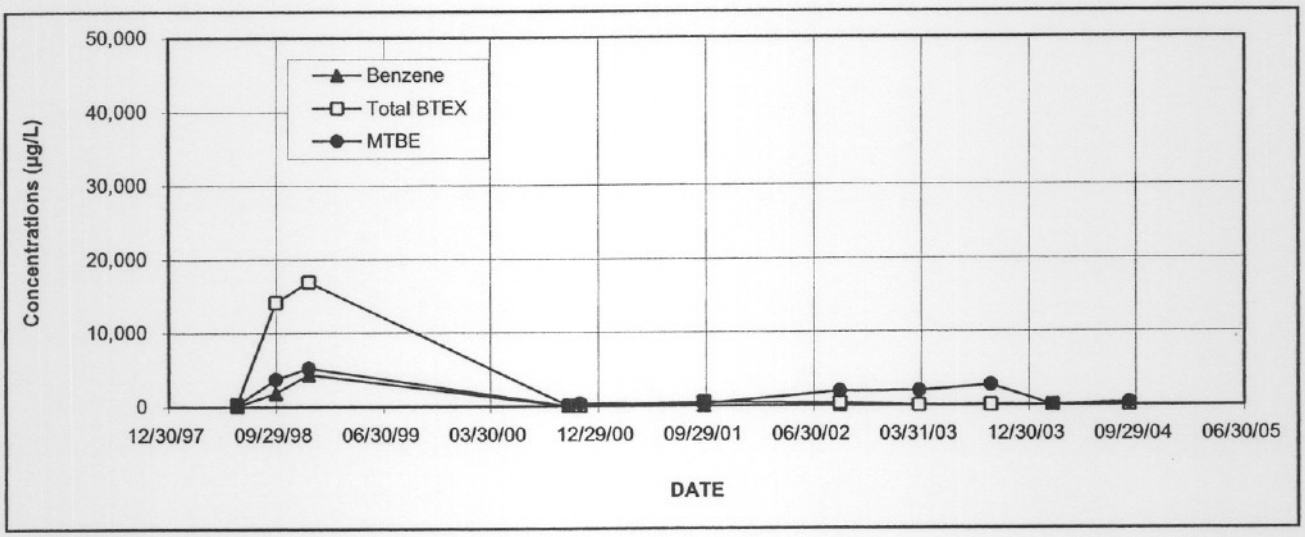



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 09/29/98 | 12,751 | 195 | 291 | 1,430 | 4,040 | 6,990 | 958 | 2,840 | 835 |
| 12/22/98 | 19,211 | 429 | 271 | 2,430 | 5,810 | 10,700 | 1,120 | 3,520 | 638 |
| 09/21/99 | 6,407 | ND<50 | ND<50 | 367 | 1,980 | 4,060 | 618 | 1,730 | 261 |
| 10/17/00 | 409 | 6.7 | 5.0 | 15.7 | 167 | 221 | 85.6 | 244 | 27.8 |
| 11/14/00 | 816.3 | 513 | 200 | 54.3 | 402 | 160 | 129 | 555 | 161 |
| 09/25/01 | 2580 | 452 | ND<20.0 | 130 | 1,050 | 1,400 | 365 | 1,060 | 126 |
| 03/26/02 | 399.4 | 789 | 12.3 | 17.1 | 238 | 132 | 96.4 | 174 | 48.2 |
| 09/01/02 | 725 | 225 | 13.8 | 41.2 | 347 | 323 | 103 | 387 | 72.7 |
| 03/27/03 | 260.8 | 305 | 16.2 | 66.2 | 50.4 | 128 | 23.6 | 68.8 | 12.6 |
| 09/25/03 | 140.95 | 149 | ND<2.5 | 3.45 | 92.2 | 45.3 | 23.2 | 137 | 20.4 |
| 03/16/04 | 202.7 | 125 | ND<5.0 | 10.2 | 104 | 88.5 | 25.1 | 200 | 30.2 |
| 09/14/04 | 384.3 | 167 | 12.3 | 17.0 | 176 | 179 | 53.0 | 189 | 23.1 |
| VGES | --- | 40 | 5 | 1,000 | 700 | 10,000 | 4 | 5 | 20 |

Notes:
Results given in micrograms per liter(µg/L)
ND- None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
* Well installed 23 April 1998
TMB - Trimethyl Benzene
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
Shaded concentrations exceed VGES.
All samples collected by ECS and analyzed by Endyne, Inc.
03/13/01 - not sampled

## FIGURE 13. SP-3
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

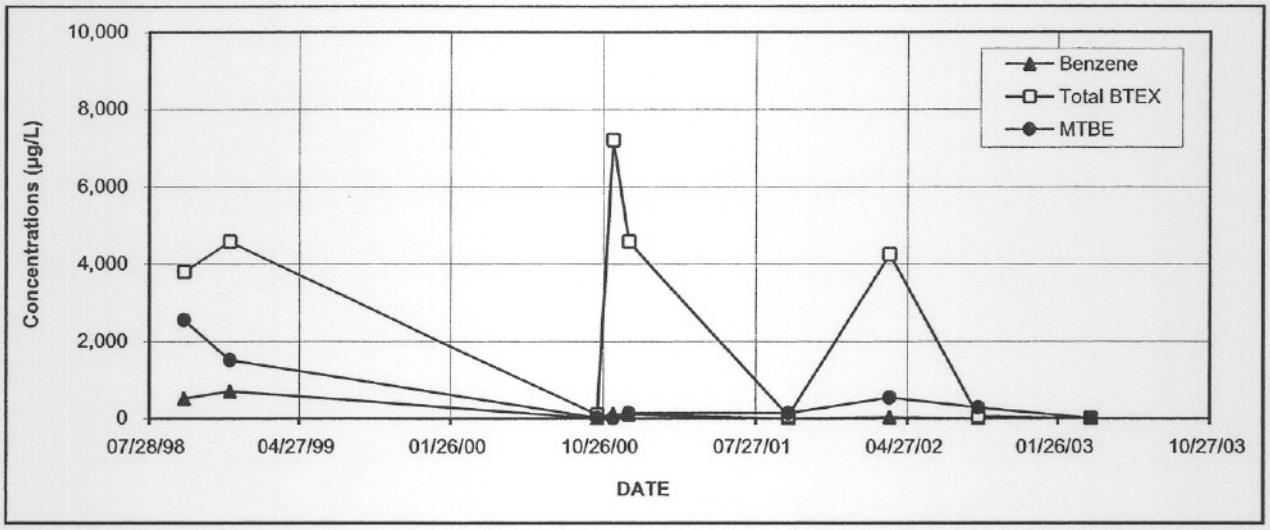



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 06/23/98 | **291.7** | **256** | **80.9** | **13.0** | **80.8** | **117** | --- | --- | --- |
| 09/29/98 | **14,150** | **3,690** | **1,840** | **4,980** | **1,430** | **5,900** | **634** | **1,620** | **345** |
| 12/22/98 | **16,920** | **5,200** | **4,360** | **4,980** | **1,620** | **5,960** | **634** | **1,750** | **343** |
| 10/17/00 | **29.5** | **6** | **<1.0** | **<1.0** | **10.2** | **19.3** | **7.5** | **25.5** | **3.9** |
| 11/14/00 | ND | **338** | ND<5.0 | ND<5.0 | ND<5.0 | ND<5.0 | ND<5.0 | **13.7** | ND<5.0 |
| 09/25/01 | **515.4** | **294** | **8.0** | **37.4** | **177** | **293** | **121** | **112** | **75.1** |
| 09/05/02 | **355.4** | **1,920** | **27.3** | **10.1** | **119** | **199** | **165** | **142** | **36** |
| 03/27/03 | **19.4** | **1,970** | **19.4** | ND<10.0 | ND<10.0 | ND<20.0 | ND<10.0 | ND<10.0 | ND<10.0 |
| 09/25/03 | **51.5** | **2,750** | ND<25.0 | ND<25.0 | ND<25.0 | **51.5** | **45** | **136** | ND<25.0 |
| 03/01/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 09/14/04 | **31.7** | **367** | **31.7** | ND<5.0 | ND<5.0 | ND<10.0 | ND<5.0 | **7.2** | ND<5.0 |
| **VGES** | --- | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes:
Results given in micrograms per liter (µg/L).
ND- None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
* Well installed 23 April 1998
TMB - Trimethyl Benzene
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
Shaded concentrations exceed VGES.
3/9/00 and 3/13/01 - Not sampled

## FIGURE 14. SP-4
## VOC Concentrations

Londonderry Citgo
Londonderry, VT

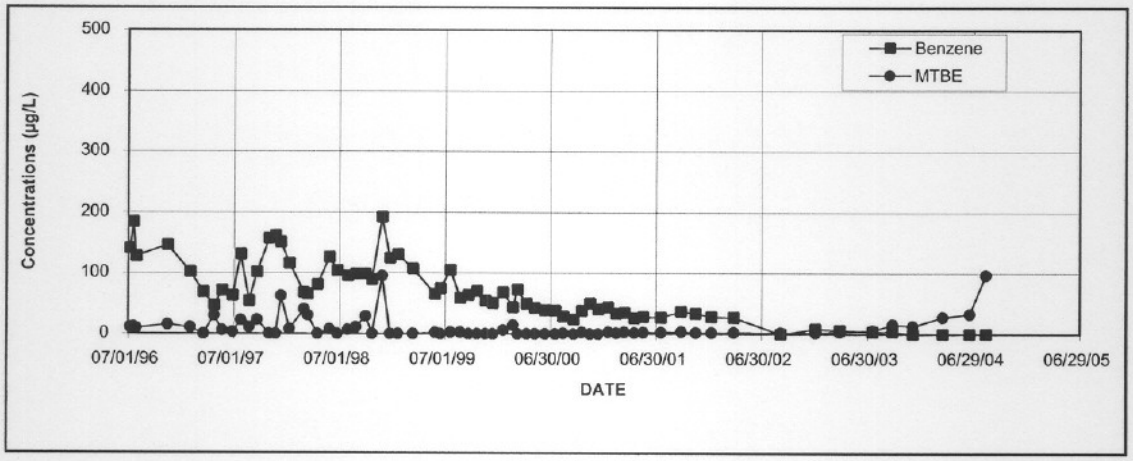



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,3,5 TMB | 1,2,4 TMB | Naph-thalene |
|---|---|---|---|---|---|---|---|---|---|
| 09/29/98 | **3,800** | **2,560** | **515** | **TBQ <50** | **945** | **2,340** | **1,180** | **2,940** | **734** |
| 12/22/98 | **4,570** | **1,520** | **706** | **774.0** | **1,130** | **1,960** | **966** | **2,040** | **357** |
| 10/17/00 | **95** | **13.7** | **2.3** | **7.4** | **32.9** | **52.4** | **18.3** | **38.1** | **13.7** |
| 11/14/00 | **7,193** | ND<40.0 | **127** | **386** | **1,480** | **5,200** | **823** | **2,550** | **490** |
| 12/13/00 | **4,583** | **137** | **109** | **394** | **1,220** | **2,860** | **551** | **1,470** | **366** |
| 09/25/01 | **66.3** | **143** | **4.0** | ND<2.0 | **49.4** | **12.9** | **31.3** | **9.2** | **39.8** |
| 03/26/02 | **4,244.8** | **544** | **29.8** | **290** | **845** | **3,080** | **524** | **1,330** | **348** |
| 09/05/02 | **53.7** | **275** | **3.7** | ND<2.0 | **40.0** | **10.0** | **18.1** | **22.2** | **18.0** |
| 03/27/03 | **3.6** | **12.0** | ND<1.0 | ND<1.0 | **3.6** | ND<2.0 | **1.4** | **1.5** | **1.9** |
| 09/25/03 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 03/16/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| **VGES** | **---** | **40** | **5** | **1,000** | **700** | **10,000** | **4** | **5** | **20** |

Notes:
Results given in micrograms per liter (µg/L).
ND- None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
All samples collected by ECS and analyzed by Endyne, Inc.
VGES - Vermont Groundwater Enforcement Standards
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
Shaded concentrations exceed VGES.
3/09/00 and 3/13/01 - Not Sampled
9/25/03 - Not samped, well was dry.

## FIGURE 15. LONDONDERRY SHOPPING CENTER
## MAIN SUPPLY WELL
## Influent VOC Concentrations

Londonderry Citgo
Londonderry, Vermont

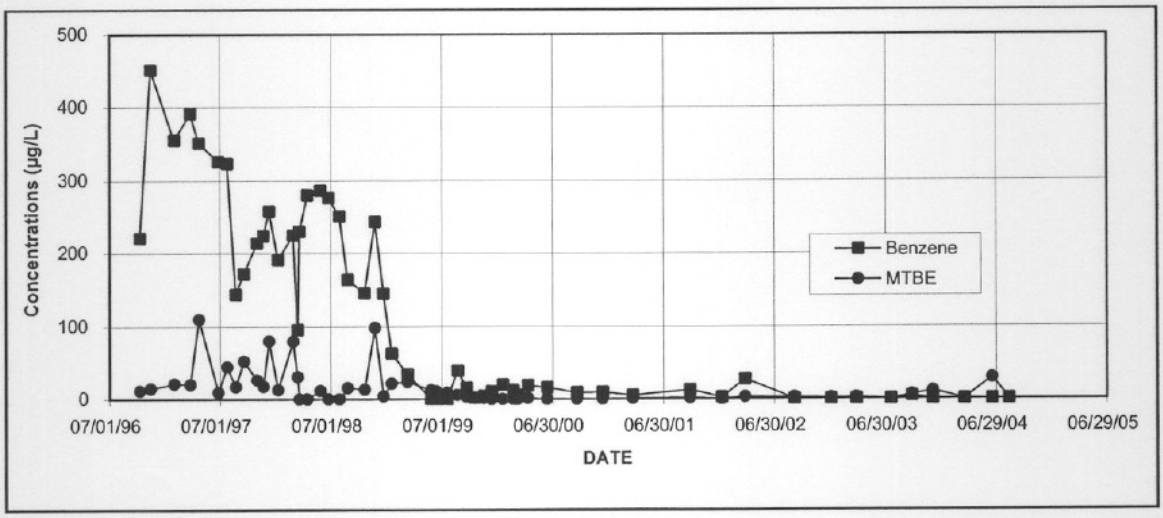



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,2,4-TMB | 1,3,5 TMB | Naphthalene |
|---|---|---|---|---|---|---|---|---|---|
| 09/19/00 | 23.8 | ND<1 | 23.8 | ND<1 | ND<1 | ND<1 | ND <1 | ND<1 | ND<1 |
| 10/17/00 | 38.0 | 2.8 | 38.0 | ND<1 | ND<1 | ND<1 | 1.7 | ND<1 | ND<1 |
| 11/14/00 | 50.2 | ND<1 | 50.2 | ND<1 | ND<1 | ND<1 | 3.5 | ND<1 | ND<1 |
| 12/13/00 | 40.6 | ND<1 | 40.6 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 01/17/01 | 43.9 | 3.3 | 43.9 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 02/14/01 | 33.2 | 1.4 | 33.2 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 03/13/01 | 34.9 | 2.9 | 34.9 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 04/17/01 | 26.3 | 2.0 | 26.3 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 05/17/01 | 29.6 | 2.5 | 28.2 | ND<1 | ND<1 | 1.4 | ND<1 | ND<1 | ND<1 |
| 07/17/01 | 27.2 | 2.7 | 27.2 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 09/25/01 | 36.9 | 3.6 | 36.9 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 11/14/01 | 33.5 | 2.2 | 33.5 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 01/08/02 | 28.1 | 2.3 | 28.1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 03/26/02 | 27.0 | 2.8 | 27.0 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 09/05/02 | ND | 2.1 | ND<1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 01/03/03 | 8.4 | 1.9 | 8.4 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 03/27/03 | 6.2 | 3.6 | 6.2 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 07/18/03 | 3.7 | 5.6 | 3.7 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 09/25/03 | 4.1 | 15.4 | 4.1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 12/03/03 | ND | 13.2 | ND<1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 03/16/04 | ND | 27.7 | ND<1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 06/16/04 | ND | 32.9 | ND <1 | ND <1 | ND <1 | ND <2 | ND <1 | ND <1 | ND <1 |
| 08/11/04 | ND | 96.4 | ND <1 | ND <1 | ND <1 | ND <2 | ND <1 | ND <1 | ND <1 |
| **MCL** | -- | -- | 5 | 1,000 | 700 | 10,000 | -- | -- | -- |
| **VHA** | -- | 40 | -- | -- | -- | -- | 5 | 4 | 20 |
| **VAL** | -- | -- | 1 | -- | -- | -- | -- | -- | -- |

Notes:
Results given in micrograms per liter (µg/L).
ND- None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
MCL-Enforceable U.S. EPA Maximum Contaminant Levels for chemicals of concern in drinking water.
VHA-Vermont Health Advisories- guidelines for chemicals in drinking water that do not have MCLs
VAL-Vermont Action Levels for eight chemicals of specific health concern in public water systems, established by the Vermont Dept. of Health.
Shading indicates exceedance of MCL, VHA and/or VAL

**FIGURE 16.**
**THORNE-THOMPSON SUPPLY WELL**
**Influent VOC Concentrations**

Londonderry Citgo
Londonderry, Vermont

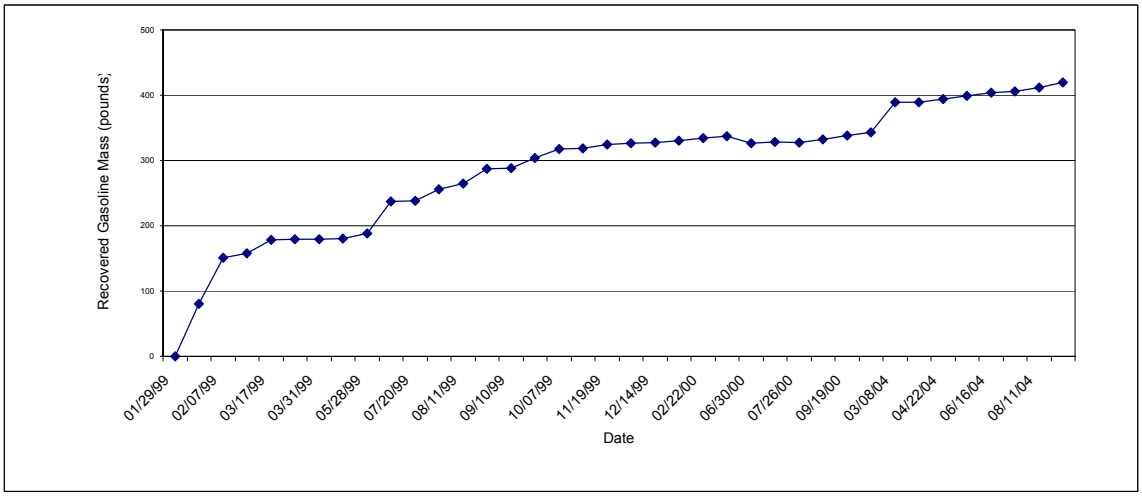



| Date | Total BTEX | MTBE | Benzene | Toluene | Ethyl benzene | Xylenes | 1,2,4-TMB | 1,2,4-TMB | Naphthalene |
|---|---|---|---|---|---|---|---|---|---|
| 09/19/00 | **8.7** | ND<1 | **8.7** | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 12/13/00 | **9.0** | ND<1 | **9.0** | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 03/22/01 | **4.6** | **1.0** | **4.6** | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 09/25/01 | **12.0** | **1.38** | **12.0** | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 01/08/02 | **2.0** | ND<1 | **2.0** | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 03/26/02 | **27.0** | **2.8** | **27.0** | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 | ND<1 |
| 09/05/02 | ND | **2.0** | ND<1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 01/03/03 | ND | **1.2** | ND<1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 03/27/03 | ND | **1.6** | ND<1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 07/18/03 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 09/25/03 | **4.1** | **5.5** | **4.1** | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 12/03/03 | ND | **10.7** | ND<1 | ND<1 | ND<1 | ND<2 | ND<1 | ND<1 | ND<1 |
| 03/16/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 06/16/04 | ND | **28.7** | ND <1 | ND <1 | ND <1 | ND <2 | ND <1 | ND <1 | ND <1 |
| 08/11/04 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| **MCL** | -- | -- | **5** | **1,000** | **700** | **10,000** | -- | -- | -- |
| **VHA** | -- | **40** | -- | -- | -- | -- | **5** | **4** | **20** |
| **VAL** | -- | -- | **1** | -- | -- | -- | -- | -- | -- |

Notes:

Results given in micrograms per liter (µg/L).
NS - Not Sampled
ND- None detected at indicated detection limit.
TBQ - Trace below quantitation limit indicated.
BTEX - Benzene, toluene, ethyl benzene, & xylenes
MTBE - Methyl tertiary butyl ether
TMB - Trimethyl Benzene
MCL-Enforceable U.S. EPA Maximum Contaminant Levels for chemicals of concern in drinking water.
VHA-Vermont Health Advisories- guidelines for chemicals in drinking water that do not have MCLs
VAL-Vermont Action Levels for eight chemicals of specific health concern in public water systems, established by the Vermont Dept. of Health.
Shading indicates exceedance of MCL, VHA and/or VAL

**Figure 17.**
**Londonderry Citgo**
Cumulative Gasoline Mass Recovery by AS/SVE System




| Date | PID (ppm) | Air Flow Rate (scfm) | Gasoline Recovery Rate (lb / day) | Cumulative Recovered Gasoline Mass (lb) |
|---|---|---|---|---|
| 01/29/99 | | | | 0 |
| 01/30/99 | 456.0 | 77 | 11.473 | 80 |
| 02/07/99 | 352.0 | 77 | 8.856 | 151 |
| 03/11/99 | 248.0 | 77 | 6.240 | 157 |
| 03/17/99 | 40.0 | 75 | 3.576 | 179 |
| 03/18/99 | 40.0 | 75 | 0.980 | 180 |
| 03/31/99 | 0.2 | 25 | 0.002 | 180 |
| 04/15/99 | 9.0 | 22 | 0.035 | 180 |
| 05/28/99 | 4.9 | 134 | 0.177 | 188 |
| 07/16/99 | 41.1 | 134 | 1.007 | 237 |
| 07/20/99 | 33.3 | 111 | 1.208 | 239 |
| 08/03/99 | 33.3 | 111 | 1.208 | 255 |
| 08/11/99 | 31.9 | 115 | 1.204 | 265 |
| 08/23/99 | 79.4 | 89 | 1.855 | 287 |
| 09/10/99 | 58.8 | 70 | 1.345 | 289 |
| 09/21/99 | 58.8 | 70 | 1.345 | 303 |
| 10/07/99 | 1.3 | 105 | 0.859 | 317 |
| 10/20/99 | 5.4 | 112 | 0.119 | 319 |
| 11/19/99 | 5.8 | 93 | 0.188 | 324 |
| 12/03/99 | 2.5 | 88 | 0.123 | 326 |
| 12/14/99 | 4.2 | 93 | 0.099 | 327 |
| 01/19/00 | 1.6 | 104 | 0.093 | 331 |
| 02/22/00 | 4.4 | 104 | 0.102 | 334 |
| 03/08/00 | 7.1 | 104 | 0.195 | 337 |
| 06/30/00 | -- | -- | -- | 326 |
| 07/17/00 | 1.3 | 123.2 | 0.156 | 329 |
| 07/26/00 | 0.0 | 109.0 | 0.025 | 327 |
| 08/14/00 | 4.5 | 93.4 | 0.078 | 332 |
| 09/19/00 | 1.9 | 88.0 | 0.108 | 338 |
| 02/18/04 | 325.0 | 48.8 | 5.182 | 343 |
| 03/08/04 | 4.6 | 41.0 | 2.418 | 389 |
| 03/16/04 | 5.4 | 42.8 | 0.068 | 390 |
| 04/22/04 | 12.0 | 48.6 | 0.130 | 394 |
| 05/11/04 | 18.3 | 40.0 | 0.219 | 399 |
| 06/16/04 | 4.1 | 37.3 | 0.141 | 404 |
| 07/06/04 | 5.2 | 77.6 | 0.087 | 405 |
| 08/11/04 | 8.8 | 77.6 | 0.177 | 412 |
| 09/14/04 | 8.0 | 87.3 | 0.226 | 419 |

**Notes:**
eq. 1.) Recovery Rate = (ppm volume) (1xe-6) (cfm) (1440 min/day) (86 lbs/mole) / (379 cf/moles of gas)
2.) 2/22/00 air flow rate estimated based on 1/19/00 and 3/09/00 data

# APPENDIX A

LABORATORY REPORT FORMS

Report Date:
27-Sep-04 12:26

SPECTRUM ANALYTICAL, INC.
*Featuring*
HANIBAL TECHNOLOGY

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

# *Laboratory Report*

Environmental Compliance Services
65 Millet Street; Suite 301
Richmond, VT 05477
Attn: Jaymi Cleland

Project:Londonderry Citgo - Londonderry, VT
Project #:VT96-0093B

| Laboratory ID | Client Sample ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| SA18086-01 | MW-3 | Ground Water | 14-Sep-04 13:20 | 16-Sep-04 13:20 |
| SA18086-02 | MW-5 | Ground Water | 14-Sep-04 13:10 | 16-Sep-04 13:20 |
| SA18086-03 | MW-6 | Ground Water | 14-Sep-04 13:22 | 16-Sep-04 13:20 |
| SA18086-04 | MW-7 | Ground Water | 14-Sep-04 13:26 | 16-Sep-04 13:20 |
| SA18086-05 | MW-8 | Ground Water | 14-Sep-04 13:11 | 16-Sep-04 13:20 |
| SA18086-06 | MW-10 | Ground Water | 14-Sep-04 13:12 | 16-Sep-04 13:20 |
| SA18086-07 | SP-1 | Ground Water | 14-Sep-04 13:17 | 16-Sep-04 13:20 |
| SA18086-08 | SP-2 | Ground Water | 14-Sep-04 13:08 | 16-Sep-04 13:20 |
| SA18086-09 | SP-3 | Ground Water | 14-Sep-04 13:15 | 16-Sep-04 13:20 |
| SA18086-10 | TRIP | Deionized Water | 14-Sep-04 08:08 | 16-Sep-04 13:20 |
| SA18086-11 | MAIN-IN | Drinking Water | 14-Sep-04 10:44 | 16-Sep-04 13:20 |
| SA18086-12 | MAIN-MID | Drinking Water | 14-Sep-04 11:01 | 16-Sep-04 13:20 |
| SA18086-13 | MAIN-EFF | Drinking Water | 14-Sep-04 11:11 | 16-Sep-04 13:20 |

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. All applicable NELAC requirements have been met.
Please note that this report contains 17 pages of analytical data plus Chain of Custody document(s).
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Massachusetts Certification # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87600/E87936
Maine # MA138
New Hampshire # 2538
New York # 11393/11840
Rhode Island # 98

ACCREDITED IN ACCORDANCE WITH nelac

Authorized by:

Hanibal C. Tayeh, Ph.D.
President/Laboratory Director

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RECEIVED
OCT - 4 2004

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MW-3**<br>SA18086-01 | VT96-0093B | Ground Water | 14-Sep-04 13:20 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | 44.6 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *88.8* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *102* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *121* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *114* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MW-5**<br>SA18086-02 | VT96-0093B | Ground Water | 14-Sep-04 13:10 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *90.0* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *101* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *119* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *111* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MW-6**<br>SA18086-03 | VT96-0093B | Ground Water | 14-Sep-04 13:22 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *88.8* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *100* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *120* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *111* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MW-7**<br>SA18086-04 | VT96-0093B | Ground Water | 14-Sep-04 13:26 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | 1.3 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *89.6* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *103* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *121* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *114* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MW-8**<br>SA18086-05 | VT96-0093B | Ground Water | 14-Sep-04 13:11 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 10.0 ug/l | 10 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | 178 | 10.0 ug/l | 10 | " | " | " | " | " | |
| Methyl tert-butyl ether | 140 | 10.0 ug/l | 10 | " | " | " | " | " | |
| Naphthalene | 93.2 | 10.0 ug/l | 10 | " | " | " | " | " | |
| Toluene | 13.4 | 10.0 ug/l | 10 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | 575 | 10.0 ug/l | 10 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | 160 | 10.0 ug/l | 10 | " | " | " | " | " | |
| m,p-Xylene | 560 | 20.0 ug/l | 10 | " | " | " | " | " | |
| o-Xylene | 87.0 | 10.0 ug/l | 10 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *91.4* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *103* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *126* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *115* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MW-10**<br>SA18086-06 | VT96-0093B | Ground Water | 14-Sep-04 13:12 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | 6.8 | 5.0 ug/l | 5 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | 159 | 5.0 ug/l | 5 | " | " | " | " | " | |
| Methyl tert-butyl ether | 142 | 5.0 ug/l | 5 | " | " | " | " | " | |
| Naphthalene | 102 | 5.0 ug/l | 5 | " | " | " | " | " | |
| Toluene | 10.4 | 5.0 ug/l | 5 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | 565 | 5.0 ug/l | 5 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | 148 | 5.0 ug/l | 5 | " | " | " | " | " | |
| m,p-Xylene | 512 | 10.0 ug/l | 5 | " | " | " | " | " | |
| o-Xylene | 83.2 | 5.0 ug/l | 5 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *93.0* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *103* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *121* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *114* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **SP-1**<br>SA18086-07 | VT96-0093B | Ground Water | 14-Sep-04 13:17 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | 45.8 | 5.0 ug/l | 5 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | 6.7 | 5.0 ug/l | 5 | " | " | " | " | " | |
| Methyl tert-butyl ether | 755 | 5.0 ug/l | 5 | " | " | " | " | " | |
| Naphthalene | 6.4 | 5.0 ug/l | 5 | " | " | " | " | " | |
| Toluene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | 5.3 | 5.0 ug/l | 5 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| m,p-Xylene | BRL | 10.0 ug/l | 5 | " | " | " | " | " | |
| o-Xylene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *91.4* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *102* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *124* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *111* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **SP-2**<br>SA18086-08 | VT96-0093B | Ground Water | 14-Sep-04 13:08 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | 12.3 | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | 176 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | 167 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | 23.1 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | 17.0 | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | 189 | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | 53.0 | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | 159 | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | 20.0 | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *91.4* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *106* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *123* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *111* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **SP-3**<br>SA18086-09 | VT96-0093B | Ground Water | 14-Sep-04 13:15 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | 31.7 | 5.0 ug/l | 5 | SW846 8260B | 23-Sep-04 | 23-Sep-04 | 4091182 | RLJ | |
| Ethylbenzene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| Methyl tert-butyl ether | 367 | 5.0 ug/l | 5 | " | " | " | " | " | |
| Naphthalene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| Toluene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | 7.2 | 5.0 ug/l | 5 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| m,p-Xylene | BRL | 10.0 ug/l | 5 | " | " | " | " | " | |
| o-Xylene | BRL | 5.0 ug/l | 5 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *90.8* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *99.2* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *119* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *109* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **TRIP**<br>SA18086-10 | VT96-0093B | Deionized Water | 14-Sep-04 08:08 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *89.2* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *101* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *129* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *115* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MAIN-IN**<br>SA18086-11 | VT96-0093B | Drinking Water | 14-Sep-04 10:44 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | 96.4 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *88.4* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *102* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *122* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *109* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MAIN-MID**<br>SA18086-12 | VT96-0093B | Drinking Water | 14-Sep-04 11:01 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | 57.5 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *91.2* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *102* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *126* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *113* | *70-130 %* | | " | " | " | " | " | |

| Sample Identification | Client Project # | Matrix | Collection Date/Time | Received |
|---|---|---|---|---|
| **MAIN-EFF**<br>SA18086-13 | VT96-0093B | Drinking Water | 14-Sep-04 11:11 | 16-Sep-04 |

| *Analyte(s)* | *Result* | **RDL/Units* | *Dilution* | *Method Ref.* | *Prepared* | *Analyzed* | *Batch* | *Analyst* | *Flag* |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds** | | | | | | | | | |
| *Volatile Organic Compounds by 8260B* | | Prepared by method Volatiles | | | | | | | |
| Benzene | BRL | 1.0 ug/l | 1 | SW846 8260B | 22-Sep-04 | 22-Sep-04 | 4091126 | RLJ | |
| Ethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Methyl tert-butyl ether | 53.8 | 1.0 ug/l | 1 | " | " | " | " | " | |
| Naphthalene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| Toluene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| m,p-Xylene | BRL | 2.0 ug/l | 1 | " | " | " | " | " | |
| o-Xylene | BRL | 1.0 ug/l | 1 | " | " | " | " | " | |
| *Surrogate: 4-Bromofluorobenzene* | *89.8* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Toluene-d8* | *102* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | *126* | *70-130 %* | | " | " | " | " | " | |
| *Surrogate: Dibromofluoromethane* | *111* | *70-130 %* | | " | " | " | " | " | |

## Volatile Organic Compounds - Quality Control

| Analyte(s) | Result | *RDL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Flag |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 4091126 - Volatiles** | | | | | | | | | | |
| **Blank (4091126-BLK1)** | | | | Prepared & Analyzed: 22-Sep-04 | | | | | | |
| Benzene | BRL | 1.0 | ug/l | | | | | | | |
| Ethylbenzene | BRL | 1.0 | ug/l | | | | | | | |
| Methyl tert-butyl ether | BRL | 1.0 | ug/l | | | | | | | |
| Naphthalene | BRL | 1.0 | ug/l | | | | | | | |
| Toluene | BRL | 1.0 | ug/l | | | | | | | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 | ug/l | | | | | | | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 | ug/l | | | | | | | |
| m,p-Xylene | BRL | 2.0 | ug/l | | | | | | | |
| o-Xylene | BRL | 1.0 | ug/l | | | | | | | |
| *Surrogate: 4-Bromofluorobenzene* | *43.0* | | ug/l | *50.0* | | *86.0* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *50.9* | | ug/l | *50.0* | | *102* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *58.9* | | ug/l | *50.0* | | *118* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *56.5* | | ug/l | *50.0* | | *113* | *70-130* | | | |
| **LCS Dup (4091126-BSD1)** | | | | Prepared & Analyzed: 22-Sep-04 | | | | | | |
| Benzene | 19.0 | | ug/l | 20.0 | | 95.0 | 70-130 | 1.57 | 30 | |
| Ethylbenzene | 17.6 | | ug/l | 20.0 | | 88.0 | 70-130 | 2.25 | 30 | |
| Methyl tert-butyl ether | 19.0 | | ug/l | 20.0 | | 95.0 | 70-130 | 1.05 | 30 | |
| Naphthalene | 17.9 | | ug/l | 20.0 | | 89.5 | 70-130 | 4.90 | 30 | |
| Toluene | 19.7 | | ug/l | 20.0 | | 98.5 | 70-130 | 0.506 | 30 | |
| 1,2,4-Trimethylbenzene | 17.5 | | ug/l | 20.0 | | 87.5 | 70-130 | 0.00 | 30 | |
| 1,3,5-Trimethylbenzene | 17.1 | | ug/l | 20.0 | | 85.5 | 70-130 | 0.00 | 30 | |
| m,p-Xylene | 36.1 | | ug/l | 40.0 | | 90.2 | 70-130 | 0.779 | 30 | |
| o-Xylene | 18.2 | | ug/l | 20.0 | | 91.0 | 70-130 | 1.09 | 30 | |
| *Surrogate: 4-Bromofluorobenzene* | *42.2* | | ug/l | *50.0* | | *84.4* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *50.1* | | ug/l | *50.0* | | *100* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *58.6* | | ug/l | *50.0* | | *117* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *55.4* | | ug/l | *50.0* | | *111* | *70-130* | | | |
| **Matrix Spike (4091126-MS1)** | **Source: SA18086-04** | | | Prepared & Analyzed: 22-Sep-04 | | | | | | |
| Benzene | 18.7 | | ug/l | 20.0 | BRL | 93.5 | 70-130 | | | |
| Chlorobenzene | 17.1 | | ug/l | 20.0 | BRL | 85.5 | 70-130 | | | |
| 1,1-Dichloroethene | 21.2 | | ug/l | 20.0 | BRL | 106 | 70-130 | | | |
| Toluene | 18.7 | | ug/l | 20.0 | BRL | 93.5 | 70-130 | | | |
| Trichloroethene | 19.5 | | ug/l | 20.0 | BRL | 97.5 | 70-130 | | | |
| *Surrogate: 4-Bromofluorobenzene* | *43.0* | | ug/l | *50.0* | | *86.0* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *50.7* | | ug/l | *50.0* | | *101* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *61.5* | | ug/l | *50.0* | | *123* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *57.3* | | ug/l | *50.0* | | *115* | *70-130* | | | |
| **Matrix Spike Dup (4091126-MSD1)** | **Source: SA18086-04** | | | Prepared & Analyzed: 22-Sep-04 | | | | | | |
| Benzene | 20.4 | | ug/l | 20.0 | BRL | 102 | 70-130 | 8.70 | 30 | |
| Chlorobenzene | 18.6 | | ug/l | 20.0 | BRL | 93.0 | 70-130 | 8.40 | 30 | |
| 1,1-Dichloroethene | 25.0 | | ug/l | 20.0 | BRL | 125 | 70-130 | 16.5 | 30 | |
| Toluene | 20.6 | | ug/l | 20.0 | BRL | 103 | 70-130 | 9.67 | 30 | |
| Trichloroethene | 21.1 | | ug/l | 20.0 | BRL | 106 | 70-130 | 8.35 | 30 | |
| *Surrogate: 4-Bromofluorobenzene* | *43.1* | | ug/l | *50.0* | | *86.2* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *51.3* | | ug/l | *50.0* | | *103* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *60.2* | | ug/l | *50.0* | | *120* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *57.9* | | ug/l | *50.0* | | *116* | *70-130* | | | |
| **Batch 4091182 - Volatiles** | | | | | | | | | | |
| **Blank (4091182-BLK1)** | | | | Prepared & Analyzed: 23-Sep-04 | | | | | | |
| Benzene | BRL | 1.0 | ug/l | | | | | | | |
| Ethylbenzene | BRL | 1.0 | ug/l | | | | | | | |
| Methyl tert-butyl ether | BRL | 1.0 | ug/l | | | | | | | |

## Volatile Organic Compounds - Quality Control

| Analyte(s) | Result | *RDL | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Flag |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 4091182 - Volatiles** | | | | | | | | | | |
| **Blank (4091182-BLK1)** | | | | Prepared & Analyzed: 23-Sep-04 | | | | | | |
| Naphthalene | BRL | 1.0 | ug/l | | | | | | | |
| Toluene | BRL | 1.0 | ug/l | | | | | | | |
| 1,2,4-Trimethylbenzene | BRL | 1.0 | ug/l | | | | | | | |
| 1,3,5-Trimethylbenzene | BRL | 1.0 | ug/l | | | | | | | |
| m,p-Xylene | BRL | 2.0 | ug/l | | | | | | | |
| o-Xylene | BRL | 1.0 | ug/l | | | | | | | |
| *Surrogate: 4-Bromofluorobenzene* | *44.8* | | ug/l | *50.0* | | *89.6* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *50.2* | | ug/l | *50.0* | | *100* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *58.6* | | ug/l | *50.0* | | *117* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *55.4* | | ug/l | *50.0* | | *111* | *70-130* | | | |
| **LCS Dup (4091182-BSD1)** | | | | Prepared & Analyzed: 23-Sep-04 | | | | | | |
| Benzene | 20.3 | | ug/l | 20.0 | | 102 | 70-130 | 1.94 | 30 | |
| Ethylbenzene | 18.0 | | ug/l | 20.0 | | 90.0 | 70-130 | 0.557 | 30 | |
| Methyl tert-butyl ether | 19.5 | | ug/l | 20.0 | | 97.5 | 70-130 | 6.45 | 30 | |
| Naphthalene | 19.7 | | ug/l | 20.0 | | 98.5 | 70-130 | 5.43 | 30 | |
| Toluene | 20.1 | | ug/l | 20.0 | | 100 | 70-130 | 1.98 | 30 | |
| 1,2,4-Trimethylbenzene | 17.4 | | ug/l | 20.0 | | 87.0 | 70-130 | 0.573 | 30 | |
| 1,3,5-Trimethylbenzene | 17.2 | | ug/l | 20.0 | | 86.0 | 70-130 | 0.583 | 30 | |
| m,p-Xylene | 36.1 | | ug/l | 40.0 | | 90.2 | 70-130 | 0.00 | 30 | |
| o-Xylene | 18.4 | | ug/l | 20.0 | | 92.0 | 70-130 | 1.08 | 30 | |
| *Surrogate: 4-Bromofluorobenzene* | *41.9* | | ug/l | *50.0* | | *83.8* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *50.4* | | ug/l | *50.0* | | *101* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *57.7* | | ug/l | *50.0* | | *115* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *56.3* | | ug/l | *50.0* | | *113* | *70-130* | | | |
| **Matrix Spike (4091182-MS1)** | **Source: SA18190-01** | | | Prepared & Analyzed: 23-Sep-04 | | | | | | |
| Benzene | 16.0 | | ug/l | 20.0 | BRL | 80.0 | 70-130 | | | |
| Chlorobenzene | 15.7 | | ug/l | 20.0 | BRL | 78.5 | 70-130 | | | |
| 1,1-Dichloroethene | 17.0 | | ug/l | 20.0 | BRL | 85.0 | 70-130 | | | |
| Toluene | 16.5 | | ug/l | 20.0 | BRL | 82.5 | 70-130 | | | |
| Trichloroethene | 17.4 | | ug/l | 20.0 | BRL | 87.0 | 70-130 | | | |
| *Surrogate: 4-Bromofluorobenzene* | *43.7* | | ug/l | *50.0* | | *87.4* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *50.5* | | ug/l | *50.0* | | *101* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *61.8* | | ug/l | *50.0* | | *124* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *56.4* | | ug/l | *50.0* | | *113* | *70-130* | | | |
| **Matrix Spike Dup (4091182-MSD1)** | **Source: SA18190-01** | | | Prepared & Analyzed: 23-Sep-04 | | | | | | |
| Benzene | 18.5 | | ug/l | 20.0 | BRL | 92.5 | 70-130 | 14.5 | 30 | |
| Chlorobenzene | 17.9 | | ug/l | 20.0 | BRL | 89.5 | 70-130 | 13.1 | 30 | |
| 1,1-Dichloroethene | 18.7 | | ug/l | 20.0 | BRL | 93.5 | 70-130 | 9.52 | 30 | |
| Toluene | 19.0 | | ug/l | 20.0 | BRL | 95.0 | 70-130 | 14.1 | 30 | |
| Trichloroethene | 18.7 | | ug/l | 20.0 | BRL | 93.5 | 70-130 | 7.20 | 30 | |
| *Surrogate: 4-Bromofluorobenzene* | *42.5* | | ug/l | *50.0* | | *85.0* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *50.9* | | ug/l | *50.0* | | *102* | *70-130* | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *61.8* | | ug/l | *50.0* | | *124* | *70-130* | | | |
| *Surrogate: Dibromofluoromethane* | *55.5* | | ug/l | *50.0* | | *111* | *70-130* | | | |

## Notes and Definitions

BRL Below Reporting Limit - Analyte NOT DETECTED at or above the reporting limit

dry Sample results reported on a dry weight basis

NR Not Reported

RPD Relative Percent Difference

A plus sign (+) in the Method Reference column indicates the method is not accredited by NELAC.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Validated by:
Hanibal C. Tayeh, Ph.D.
Dan DeAlmeida

SA18086 MA

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HANIBAL TECHNOLOGY

# CHAIN OF CUSTODY RECORD

Page 1 of 2

**Special Handling:**
- ☒ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed: _____
- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 60 days unless otherwise instructed.

Report To: ECS - RICHMOND, VT

Invoice To: ECS - AGAWAM
400 5493 JMS

Project No.: VT96-0093B
Site Name: LONDONDERRY CITGO
Location: LONDONDERRY State: VT
Sampler(s): B. KEMP / D. KALISZ

Project Mgr.: J. CLELAND

P.O. No.: _____ RQN: _____

1=$Na_2S_2O_3$ 2=HCl 3=$H_2SO_4$ 4=$HNO_3$ 5=NaOH 6=Ascorbic Acid
7=$CH_3OH$ 8= $NaHSO_4$ 9= 4°C (ice) 10=_____

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1= $D.H_2O$ X2=_____ X3=_____

G=Grab C=Composite

| Lab Id: | Sample Id: | Date: | Time: | Type | Matrix | Preservative | # of VOA Vials | # of Amber Glass | # of Clear Glass | # of Plastic | 8021 B VT VOC scan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SA18086-01 | MW-3 | 9/14/04 | 1:20 | G | GW | 2,9 | 2 | | | | X |
| -02 | MW-5 | | 1:10 | | | | | | | | X |
| -03 | MW-6 | | 1:22 | | | | | | | | X |
| -04 | MW-7 | | 1:26 | | | | | | | | X |
| -05 | MW-8 | | 1:11 | | | | | | | | X |
| -06 | MW-10 | | 1:12 | | | | | | | | X |
| -07 | SP-1 | | 1:17 | | | | | | | | X |
| -08 | SP-2 | | 1:08 | | | | | | | | X |
| -09 | SP-3 | | 1:15 | | | | | | | | X |
| -10 | TRIP | | 8:08 | | X1 | | 1 | | | | X |

Containers: # of VOA Vials, # of Amber Glass, # of Clear Glass, # of Plastic

Analyses: 8021 B VT VOC scan

**QA Reporting Notes:** (check if needed)

State specific reporting standards
*If applicable, please list below.*

☐ Provide MCP CAM Report
Were all field QC requirements met as per MADEP CAM Section 2.0?
☐ Yes ☐ No
*(Response required for CAM report)*

☒ Fax results when available to (802) 434-6076
☒ E-mail to Jcleland@ecsconsult.com
EDD Format PDF

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C 4C

| Relinquished by: | Received by: | Date: | Time: |
|---|---|---|---|
| | | 9/16/04 | 9:58 |
| | | 9/16/04 | 120 |

Refrig

11 Almgren Drive • Agawam, Massachusetts 01001 • 413-789-9018 • Fax 413-789-4076 • www.spectrum-analytical.com

18086

SPECTRUM ANALYTICAL, INC.
*Featuring*
HANIBAL TECHNOLOGY

# CHAIN OF CUSTODY RECORD

Page 2 of 2

**Special Handling:**
- ☒ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed: _____
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- Samples disposed of after 60 days unless otherwise instructed.

Report To: ECS - BICHMOND, VT

Invoice To: ECS - AGAWAM

Project No.: VT96-0093B

Site Name: LONDONDERRY CITGO

Location: LONDONDERRY State: VT

Project Mgr.: J. CLELAND

P.O. No.: _____ RQN: _____

Sampler(s): R. KEMP / D. KALISZ

1=$Na_2S2O_3$ 2=HCl 3=$H_2SO_4$ 4=$HNO_3$ 5=NaOH 6=Ascorbic Acid
7=$CH_3OH$ 8=$NaHSO_4$ 9= 4°c (ice) 10=_____

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

| Lab Id: | Sample Id: | Date: | Time: | Type | Matrix | Preservative | Containers: # of VOA Vials | # of Amber Glass | # of Clear Glass | # of Plastic | Analyses: 8021B VT VOC Scan | QA Reporting Notes: (check if needed) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18086-11 | MAIN-IN | 9/14/04 | 10:44 | G | DW | 2,9 | 2 | | | | X | State specific reporting standards *If applicable, please list below.* _____ ☐ Provide MCP CAM Report Were all field QC requirements met as per MADEP CAM Section 2.0? ☐ Yes ☐ No *(Response required for CAM report)* |
| -12 | MAIN-MID | ↓ | 11:01 | ↓ | ↓ | ↓ | ↓ | | | | X | |
| -13 | MAIN-EFF | ↓ | 11:11 | ↓ | ↓ | ↓ | ↓ | | | | X | |

☒ Fax results when available to (802) 434-6076

☒ E-mail to Jcleland@ecsconsult.com

EDD Format PDF

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C 4C

| Relinquished by: | Received by: | Date: | Time: |
|---|---|---|---|
| | | 9/16/04 | 9:59 |
| | | 9/16/04 | 1720 |