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WASTE MANAGEMENT
DIVISION

25 July 1996

Mr. Chuck Schwer
VT Dept. of Environmental Conservation
Waste Management Division
103 South Main Street / West Building
Waterbury, VT 05671-0404

96-1986

RE: Former Orleans Candy Co., Expressway Investigation Report

Dear Mr. Schwer,

Enclosed is one bound copy of the Initial Site Investigation Report outlining the findings of the "Expressway" investigation conducted at the Former Orleans Candy Co. (currently Ray's Auto Service) located in Newport, Vermont.

Please give me a call if you have any questions or comments regarding this report.

Sincerely,

Bruce Hamilton

Bruce Hamilton
Environmental Engineer

cc: Raymond Geoffrey, Ray's Auto Service

enclosure

Ref: 96037L04.SAM

INITIAL SITE INVESTIGATION REPORT

**Former Orleans Candy Co.
(Currently Ray's Auto Service)
Newport, Vermont**

10 July 1996

96-1986

Prepared for:

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Newport, VT 05855
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GWV Project #V96-037

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EXECUTIVE SUMMARY

Ground Water of Vermont (GWV) has conducted an initial site investigation in the area of two abandoned gasoline underground storage tanks (USTs) at the former Orleans Candy Company on Coventry Street in Newport, Vermont. Field investigations following removal of the USTs included the installation of three monitoring wells; field screening of subsurface soils for the presence of volatile organic compounds (VOCs); sampling and analysis of ground water from the three monitoring wells; and a site survey for the purposes of identifying and assessing potential risks to environmental and public health.

This Initial Site Investigation Report presents the results of these investigations, as well as GWV's conclusions and recommendations. GWV's conclusions are summarized as follows:

1. Gasoline has been released to soil and ground water around the former USTs. The former USTs appear to be the only contaminant source.
2. The relatively low gasoline compound concentrations and absence of the gasoline additive MTBE in the monitoring well installed in the UST excavation (MW-1) suggest that the gasoline releases were not recent.
3. The low contaminant concentrations in the two nearby monitoring wells suggest that the ground-water contaminant plume covers a small area, and is unlikely to have migrated significantly.
4. Surficial materials at the site generally consist of sand and gravel fill from the surface downward to approximately 3-foot depth, underlain by a layer of sand and silt to depths varying from 6 to 9 feet, which is in turn underlain by sand and gravel. Groundwater was present during the May 1996 sampling event at depths of 3.5 - 4 feet below ground surface, and was flowing north at an average gradient of approximately 0.3%.
5. The direction of ground-water flow had been anticipated on the basis of surface topography to be generally eastward, toward the nearest point of Lake Memphremagog. As a result, the intended downgradient monitoring wells (MW-2 and MW-3) appear to be obliquely up-gradient (MW-2) and obliquely downgradient (MW-3), respectively.
6. Although no monitoring wells appear to be located directly downgradient of the former USTs, GWV does not believe that installation of additional wells is warranted at this time. This conclusion is based on the relatively low ground-water contaminant concentrations in the apparent source area, the low ground-water gradient, the absence of any nearby sensitive receptors, and the possibility of seasonal fluctuations in ground-water flow direction.
7. The residual contamination in soil and ground water does not appear to pose an imminent threat to environmental or public health.

EXECUTIVE SUMMARY (Cont.)

On the basis of these conclusions, GWV recommends the following:

1. Contaminant concentrations and ground-water elevations in the three on-site wells should be monitored quarterly for one year.
2. The results of the first year's quarterly monitoring program should be used to evaluate the need for additional investigation and/or continued ground-water monitoring at the site.

1.0 INTRODUCTION

This report details the results of an initial site investigation conducted at the former Orleans Candy Company (currently Ray's Auto Service) on Coventry Street in Newport, Vermont (Figure 1). The report has been prepared by Ground Water of Vermont (GWV) for Raymond Geoffrey, the current facility owner.

This site investigation was initiated under Vermont's Expressway notification process following the removal on 15 May 1996 of two abandoned 1,000-gallon gasoline underground storage tanks (USTs) that had apparently leaked into the subsurface. GWV informed Ms. Susan Thayer of the Vermont Department of Environmental Conservation (VT DEC) in its UST Closure Report dated 21 May 1996 that a site investigation was warranted given the presence of ground-water contamination in the tank excavation.

1.1 Site Location and Physical Setting

The site is located on Coventry Street in the city of Newport, immediately north and east of the intersection of Coventry Street and Eastern Avenue (Figure 1). The on-site building is located 36 feet from the eastern edge of Coventry Street. A previous building on the site was demolished last winter and replaced with the new structure.

The site and surrounding area are zoned for combined commercial/residential development and are occupied by three automotive repair businesses, an apartment building and a multi-family residence. The on-site building is a newly constructed single-story wood and metal structure using slab-on-grade construction. The current building is served by Newport municipal water and sewer service as are all other buildings in the area.

The nearest surface-water body, the South Bay of Lake Memphremagog, is approximately 250 feet to the east and 500 feet south of the property. Presumed regional surface drainage and ground-water flow are toward the bay. The flat surface topography between the site and the lake suggests that the ground-water gradient between the site and the lake is low.

Native surficial materials at the site are mapped as kame moraine, which is a gravel deposit bordering glacial margins (Stewart and MacClintock, 1970). Bedrock underlying the site is mapped as Ayers Cliff limestone (Doll, 1961).

1.2 Site History

The site is currently owned by Raymond Geoffrey of Newport, Vermont. Mr. Geoffrey purchased the site in November 1995 from Charles and Ann Berrio of Orleans. Mr. Geoffrey demolished the on-site building and replaced it with the current building in January 1996.

The previous site owners operated the former Orleans Candy Company, a wholesale distributor of food and confectionery items to local restaurants, at the site from 1963 to 1992. The Orleans Candy Company reportedly stored gasoline in two underground storage tanks for use in fueling their fleet vehicles. The USTs were reportedly taken out of service in approximately 1985.

Mr. Geoffrey reported that he was not informed of the presence of any USTs on the property prior to his purchase, and that no surface evidence of the presence of the USTs (such as fill or vent pipes, manholes, dispensers, islands, or concrete slabs) was visible until the building was demolished, after which one fill pipe had been discovered within a section of concrete in the building debris. When he contacted the previous owners regarding the UST discovery, they reportedly told him that they had used the USTs to fuel their vehicles from approximately 1963 through approximately 1985.

The locations of the USTs were not determined until 13 May 1996, when excavation activity associated with the installation of municipal sewer service to the new building encountered one of the USTs. The second UST was not discovered until the first UST had been removed. According to representatives of the excavating firm, no surface evidence of the tanks' presence existed.

The USTs consisted of two unregistered single-walled steel 1,000-gallon tanks. The tanks lay approximately ten feet from the eastern edge of Coventry Street and 25 feet west of the on-site building. No pump assemblies or vent lines were present, although remnants of piping remained, beneath the ground surface.

The USTs were removed from the ground in the presence of GWV personnel on 15 May 1996, at which time evidence was observed of leakage from both USTs. Both tanks were found to have holes, and soils around the USTs had extensive petroleum staining and odors. Photoionization detector (PID; HNU Model PI-101) readings on soil samples collected from the excavations were as high as 210 parts per million (ppm), and averaged approximately 139 ppm. Ground water, encountered at a depth of four feet, appeared to be contaminated, although free-phase petroleum product was not observed. Native soils beneath the water table consisted of fine-to-medium sand and gravel.

The tanks were cleaned and purged by Fred's Plumbing and Heating of Derby, Vermont on 15 May 1996. The tank excavation and removal were performed by Gosselin's Excavating (Roger Gosselin Inc.) also of Derby. The tanks were disposed of by Nadeau's Salvage of Coventry, Vermont. The tanks were found to be in generally poor condition — rusted and pitted — and had apparently leaked through a corroded end-seam and bottom holes respectively. Contaminated soils encountered around one of the fill-ports also suggested that spills occurred during tank

refueling. After a monitoring well was installed in the tank excavation all excavated soils were backfilled.

Tim McNamara of VT DEC was present on-site for the first UST removal and was verbally notified of the presence of petroleum contamination within the tank pit at that time.

1.3 Purpose and Scope of Work

The purposes of this initial site investigation were to:

- Evaluate the degree and extent of soil and ground-water contamination at the site.
- Qualitatively assess the risks to environmental and public health by identifying all relevant sensitive receptors and potential contaminant migration pathways.
- Identify potentially appropriate remedial actions based on the site conditions.
- Provide preliminary recommendations for future action.

To accomplish these objectives, GWV has:

- Reviewed existing historical site data.
- Supervised the installation of three monitoring wells (MW-1, 2, and 3), and determined the local ground-water flow direction and gradient.
- Collected and submitted for laboratory analysis ground-water samples from the three monitoring wells (MW-1, 2 and 3).
- Identified sensitive receptors in the area.
- Assessed the risk posed by the contamination to these potential receptors.
- Evaluated the need for treatment and/or a long-term monitoring plan for the site.
- Prepared this summary report, which details the work performed, qualitatively assesses risks, provides conclusions and offers recommendations for further action.

2.0 INVESTIGATIVE PROCEDURES AND RESULTS

2.1 Monitoring Well Installation

One monitoring well (MW-1) was installed in the open UST excavation on 15 May 1996. On 21 May 1996, GWV supervised the installation of two additional monitoring wells. Wells MW-2 and MW-3 were placed in areas presumed to be downgradient from the former USTs, as suggested by surrounding surface topography and waterway proximity. Approximate well locations are shown on Figure 2. The monitoring wells were installed by Adams Engineering of Underhill, Vermont using vibratory drilling techniques to both advance the borings and emplace the wells.

Monitoring well #2 and #3 borings were completed to a depth of 12 feet and 14.8 feet respectively. Continuous soil samples were collected at each monitoring-well boring location using a five-foot polyethylene-lined core barrel with a 2.375 -inch inner diameter. The core barrel, which also served as the drill bit with an outer diameter of 4.0 inches, was simultaneously pushed and vibrated into place to advance the boring. The sample cores obtained were screened for the presence of volatile organic compounds (VOCs) with a PID and logged for lithology by GWV personnel. All downhole drilling equipment was decontaminated and the polyethylene core barrel liner changed between borings. The PID soil screening results are discussed in Section 2.2 below.

The unconsolidated overburden encountered in each boring generally consisted, from the ground surface down, of up to five feet of medium-to-coarse brown sand and gravel fill (including several bricks), two to four feet of fine dark gray-brown sand and silt, and four to six feet of coarse gray-black sand and gravel. Soil samples collected from the MW-2 boring had a distinct weathered petroleum odor, and showed evidence of significant petroleum staining. Detailed stratigraphic soil descriptions are included on the boring/well logs in Appendix B. Bedrock was not encountered in any of the borings.

Ground water was encountered in both of the borings at about three to four feet below ground surface. A monitoring well was installed in each soil boring by vibrating a two-inch diameter PVC well point into the open hole left by the core barrel. A 10-foot section of 0.010-inch slot high-flow screen was placed such that approximately two feet of screen extended above the apparent water table. Solid two-inch diameter PVC riser extended from the top of screen to approximately 0.5 feet below ground surface. Clean quartz #1 filter sand was placed in any open annulus around the well to at least 0.5 feet above the top of the screened interval. A bentonite seal at least one-foot thick was installed above the sand pack and the remainder of the annular space was filled with native material. Each completed monitoring well was protected by a flush-mounted steel roadbox to be cemented in place. Monitoring-well construction details are included on the boring/well logs in Appendix B.

Wells MW-2 and MW-3 were developed immediately after construction using a peristaltic pump. Development water was discharged to the ground surface in the vicinity of each well.

2.2 Subsurface Soil Screening Results

Soil headspace screening for the presence of volatile organic compounds (VOCs) was conducted in the field on samples from discrete depth intervals throughout each boring using a Photovac TIP II PID calibrated with isobutylene gas to a benzene reference. Readings ranged from 0.8 ppm in a deep sample from MW-3 to over 272 ppm in a sample taken from MW-2 near the water-table surface. Readings obtained in the vicinity of the tank excavations (recorded during tank closure) and from the MW-2 boring generally increased with depth. The opposite trend was noted in MW-3. PID screening results are included on the boring logs in Appendix B.

2.3 Determination of Ground-Water Flow Direction and Gradient

Fluid levels were initially measured in all three of the site monitoring wells on 28 May 1996. The wells were resurveyed and water levels re-measured on June 8 and 9 in order to confirm the initial measurements. Water-table elevations were computed for each monitoring well by subtracting the measured depth-to-water readings from the surveyed top-of-casing elevations, which are relative to an arbitrary 100.00-foot datum. Water-level measurements and elevation calculations for 8 June 1996 are presented in Table 1. The ground-water contour map in Figure 3 was prepared using this data.

Ground water in the unconfined surficial aquifer beneath the site appears to be flowing northward to the main portion of Lake Memphremagog and not in the direction of the much closer South Bay section, as had been presumed. The average ground-water gradient was about 0.3 %.

2.4 Ground-Water Sampling and Analysis

Ground-water samples were collected from all three on-site monitoring wells on 28 May 1996. Each monitoring well was purged prior to sampling using a new disposable bailer and dropline, which were then used to collect the sample and left in the well for future sample collection. Recharge rates observed in all the wells during development and pre-sample purging were high. Trip blank and duplicate samples were collected to ensure that adequate quality assurance/quality control (QA/QC) standards were maintained. All field procedures were conducted in accordance with GWV standard protocols.

All samples were placed in ice-filled coolers and transported under chain-of-custody to a Vermont certified analytical laboratory, where they were tested for the presence of the regulated gasoline compounds benzene, toluene, ethyl benzene, and xylenes (collectively termed "BTEX") and for the gasoline additive methyl-tertiary butyl-ether (MTBE) by EPA Method 8020. Analytical results for all the samples are summarized in Table 2. A contaminant distribution map of BTEX and MTBE is presented as Figure 4. Laboratory report forms are included in Appendix C.

Gasoline compounds were detected in all of the monitoring wells, although as discussed below, the similarity between the results for MW-3 and those for the trip-blank sample suggest that the toluene detected in the monitoring-well sample could represent contamination that occurred during the sample collection, transport and analytical process. MTBE, an octane-boosting

gasoline additive in widespread use since approximately 1980, was not detected in any of the wells.

The State of Vermont has established ground-water enforcement standards (GWESs) for the BTEX compounds and MTBE, with maximum levels as follows: benzene- 5 parts per billion, or ppb; toluene- 2,420 ppb; ethyl benzene- 680 ppb; xylenes- 400 ppb; and MTBE- 40 ppb.

The only sampled location at which groundwater appears to exceed VGESs for gasoline compounds was monitoring well MW-1, located in the former UST grave. Compounds detected in this well at levels above their respective VGES included benzene, at 125 ppb, and xylenes, at 6,190 ppb. Given that this well is located in the apparent source area, the relatively low levels of BTEX, the high proportion of xylenes relative to benzene, and the absence of MTBE suggest that the gasoline release or releases were not recent.

Although none of the monitoring wells appear to be located directly downgradient from the former USTs, the low contaminant concentrations in the obliquely up-gradient well (MW-2) and obliquely downgradient well (MW-3) suggest that the ground-water contaminant plume is not really extensive.

Analytical results for the 28 May duplicate sample were within 17 percent of the original sample results for all identified compounds.

Toluene was detected in the trip-blank QA/QC sample at a concentration of 2.5 ppb. The trip blank had been collected from a newly-opened gallon bottle of commercially-available distilled water prior to going into the field, and had remained in the cooler throughout the sample-collection and transport process. GWV's review of possible causes of this result suggests that the water became contaminated before the bottle was opened. Low levels of toluene contamination have periodically appeared in trip-blank samples, and previous investigations have generally concluded that the contaminant migrated through the low-density polyethylene (LDPE) container (which is permeable to toluene) during storage and transport of the water prior to retail sale. Nevertheless, the presence of only toluene at a similar level in one of the monitoring wells (MW-3) suggests that it is possible that the samples became slightly contaminated at some point in the sample collection, transport, or analytical process.

3.0 SENSITIVE RECEPTOR SURVEY AND RISK ASSESSMENT

GWV conducted a survey to identify potentially impacted sensitive receptors near the site and evaluated their potential to be impacted by the soil and ground-water contamination identified at the site. Our findings are discussed below.

- The current structure and all nearby facilities are served by municipal water. Although a Newport municipal water-supply well was identified approximately one-half mile west of the site, the well appears to be upgradient from the site, and is thus unlikely to be threatened by the contamination detected at the site.
- Buried utilities (water and wastewater/stormwater collection systems) are located along the eastern edge of Coventry Street in the immediate vicinity of the former UST location (approximately parallel to ground-water flow). An inspection of nearby storm-drain culverts revealed no qualitative evidence of gasoline-compound contamination emanating from the site as liquid or gaseous phases.
- Both the on-site building and the garage immediately north of the tank grave (Perry's Tire Barn) have at-grade concrete slab foundations, so it is considered unlikely that gasoline vapors could impact indoor air quality.
- Ground-water data at the site suggest that the area of ground-water contamination has been constrained to the immediate area of the former UST location by the low hydraulic conductivity of the surrounding soils and shallow ground-water flow gradient.
- A site walkthrough revealed no evidence of ground-water seeps near surrounding buildings or along the railroad right-of-way bordering Lake Memphremagog.
- The nearest surface water body is the South Bay of Lake Memphremagog, approximately 250 feet to the east at its closest point. There is no evidence to suggest that appreciable levels of dissolved-phase gasoline compounds from the site have reached as far as the lake.
- PID soil screening data from the UST excavations and monitoring-well borings suggest the shallow area of soil contamination is limited to the immediate vicinity of the former UST locations. The area containing contaminated soils is scheduled to be paved in the near future, which will limit the potential for direct public exposure to contaminated soils.

In summary, available evidence suggests that residual subsurface contamination associated with the former leaking UST does not appear to pose a significant threat to any nearby sensitive receptors.

4.0 CONCLUSIONS

Based on the results of the site investigation described above, Ground Water of Vermont concludes the following:

1. Gasoline has been released to soil and ground water from two 1,000 gallon gasoline USTs, which were removed from the ground on 15 May 1996. No other USTs are known to exist on the property.
2. The relatively low BTEX concentrations in the monitoring well installed in the former UST location (MW-1) suggest that the gasoline releases were not recent.
3. Contaminant concentrations in the two nearby monitoring wells suggests that the ground-water contaminant plume covers a small area, and is unlikely to have migrated significantly.
4. Surficial materials at the site generally consist of sand and gravel fill from the surface downward to approximately 3-foot depth, underlain by sand and silt to depths varying from 6 to 9 feet, which is in turn underlain by sand and gravel. Ground water was present during the May sampling event at depths of 3.5 - 4 feet below ground surface, and was flowing north at an average gradient of approximately 0.3%.
5. The direction of ground-water flow had been anticipated on the basis of surface topography to be generally eastward, toward the nearest point of the South Bay of Lake Memphremagog. As a result, the intended downgradient monitoring wells (MW-2 and MW-3) appear to be obliquely up-gradient (MW-2) and obliquely downgradient (MW-3).
6. Although no monitoring wells appear to be located directly downgradient of the former USTs, GWV does not believe that installation of additional wells is warranted at this time. This conclusion is based on the relatively low contaminant concentrations in ground water in the apparent source area, the low ground-water gradient, the absence of any nearby sensitive receptors, and the possibility of seasonal fluctuations in ground-water flow direction.
7. The residual contamination in soil and ground water does not appear to pose an imminent threat to environmental or public health.

5.0 RECOMMENDATIONS

On the basis of the findings reached during this investigation, Ground Water of Vermont makes the following recommendations:

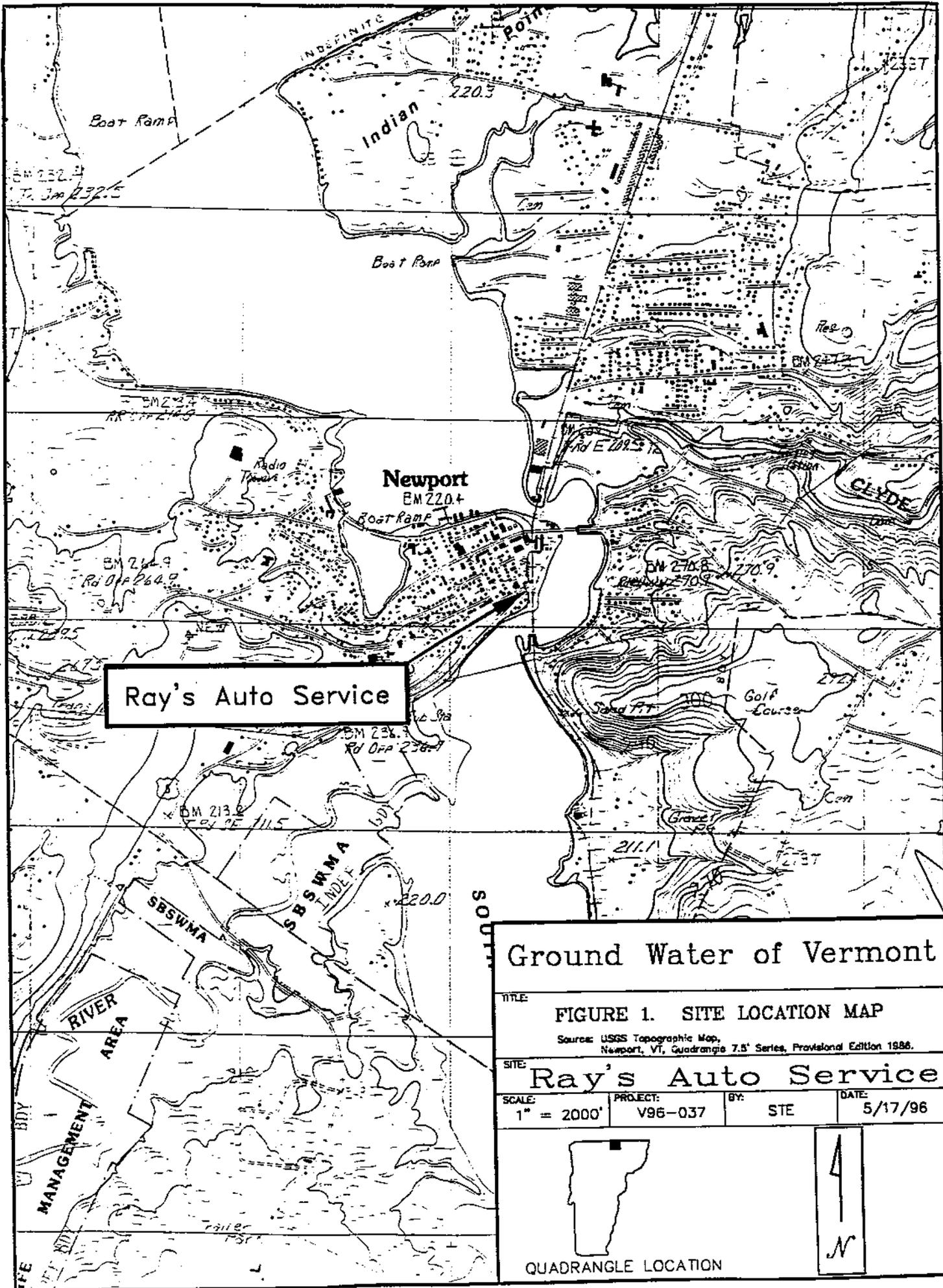
1. Contaminant concentrations and ground-water elevations in the three on-site wells should be monitored quarterly for one year.
2. The results of the first year's quarterly monitoring program should be used to evaluate the need for additional investigation and/or continued ground-water monitoring at the site.

6.0 REFERENCES

- Doll, C.G. and others, 1961. *Geologic Map of Vermont*, Office of the State Geologist.
- Fetter, C.W., 1994. *Applied Hydrogeology, 3rd Ed.*, Prentice Hall, Englewood Cliffs, New Jersey, 691 p.
- Domenico, P.A., and Schwartz, F.W., 1990. *Physical and Chemical Hydrogeology*, John Wiley and Sons, New York, 824 p.
- Stewart, D.P. and P. MacClintock, 1970. *Surficial Geologic Map of Vermont*, Office of the State Geologist.

APPENDIX A

Figures and Tables



Ray's Auto Service

Ground Water of Vermont

TITLE:			
FIGURE 1. SITE LOCATION MAP			
Source: USGS Topographic Map, Newport, VT, Quadrangle 7.5' Series, Provisional Edition 1986.			
SITE:			
Ray's Auto Service			
SCALE:	PROJECT:	BY:	DATE:
1" = 2000'	V96-037	STE	5/17/96

QUADRANGLE LOCATION



COVENTRY STREET

MW-1
FORMER 1K GAS UST [●] FORMER 1K GAS UST
95.94

MW-2
● 95.97

● MW-3
95.90

APART-
MENT
BUILDING

RAY'S AUTO SERVICE

PERRY'S
TIRE
BARN

LAKE
MEMPHREMAGOG
APPROX. 250'



SCALE

ALL LOCATIONS ARE APPROXIMATE



Ground Water of Vermont

1 Mill St., Box C-5
Burlington, VT 05401
(802) 860-6065

Ray's Auto Service
NEWPORT, VT

FIGURE 2.
SITE MAP
WITH MONITORING WELLS

LEGEND:

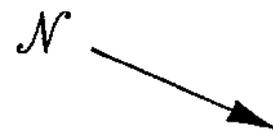
● MONITORING WELL

DRAWN BY: STE

DATE: APR 1996

APPROVED BY: RM

FILE No.: 96037



COVENTRY STREET

MW-1
7,331 ppb BTEX
ND MTBE

MW-2

35.7 ppb BTEX
ND MTBE

MW-3
2.3 ppb BTEX
ND MTBE

APART-
MENT
BUILDING

RAY'S AUTO SERVICE

PERRY'S
TIRE
BARN

LAKE
MEMPHREMAGOG
APPROX. 250'



SCALE

ALL LOCATIONS ARE APPROXIMATE



Ground Water of Vermont

1 Mill St., Box C-5
Burlington, VT 05401
(802) 860-6065

Ray's Auto Service
NEWPORT, VT

FIGURE 4.
CONTAMINANT DISTRIBUTION MAP
MONITORING DATE: 28 MAY 1996

LEGEND:
● MONITORING WELL
ND NOT DETECTED

DRAWN BY: STE

DATE: APR 1996

APPROVED BY: RM

FILE No.: 96037

TABLE 1. GROUND-WATER ELEVATION CALCULATIONS

**Ray's Auto Service
Newport, VT**

Well I.D.	Date	Top of Casing Elevation	Depth to Product	Depth to Water	Product Thickness	Corrected Depth to water	Water Table Elevation
MW-1	06/08/96	99.38	-	3.44	-	-	95.94
MW-2	06/08/96	99.53	-	3.56	-	-	95.97
MW-3	06/08/96	100.00	-	4.10	-	-	95.90

All values reported in feet relative to arbitrary datum.

TABLE 2. ANALYTICAL RESULTS - 28 MAY 1996

**Ray's Auto Service
Newport, VT**

Location	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	MTBE
MW-1	125	363	653	6,190	7,331	ND <1
MW-2	ND <1	20.1	ND <1	15.6	35.7	ND <1
MW-3	ND <1	2.3	ND <1	ND <1	2.3	ND <1
Duplicate	109.0	303.0	588.0	6,430.0	7,430	ND <1
Blank	ND <1	2.5	ND <1	ND <1	ND	ND <1
VGES	5	2,420	680	400		40

Notes: Results given in parts per billion (ppb).
ND: None detected at indicated detection limit.
VGES: Vermont Groundwater Enforcement Standards
Duplicate sample is from MW-1.

APPENDIX B

Boring Logs



Ground Water of Vermont

FIELD SUPERVISOR B. Storer
CONTRACTOR Adams Engineering
DRILLERS Jerry Adams

JOB LOCATION Rays Auto
DATE 5/21/96

DRILLING METHOD *vibratory,*
2.375"

AND 40 - 50%
SOME 10 - 40%
TRACE 0 - 10%

BORING LOCATION BORING #
sketch on back or on-site plan MW-2
with measurements TOTAL DEPTH
12.0'

BORING DIAMETER 2.375"

BLOWS PER 6"

0	6	12	18	24
6	12	18	24	

DEPTH	SAMPLES	SAMPLE NUMBER	BLOWS PER 6"	REG.
5'				2.5
10'				5.0
15'				
20'				
25'				
30'				
35'				
40'				

SAMPLE DESCRIPTION

2.5' medium to coarse brown sand and backfill (ex - bricks)
↓

5.0' fine dark gray - brown sand + silt + bricks
↓

5.0' coarse gray - black sand and gravel w/ wood, glass, bricks
↓

STRAT CHG

GENERAL DESCRIPTION

1.8 ppm
water table - water is black w/ a sheen, looks like broken down waste oil

2.72 ppm
petroleum odor
black stained soils

213 ppm
petroleum odor
black stained soils



DEPTH
5'
10'
15'
20'
25'
30'
35'
40'

MATERIALS USED	SIZE/TYPE	QUANTITY	MATERIALS USED	SIZE/TYPE	QUANTITY
WELL SCREEN	2" / 0.10 / PVC	10'	GROUT		no
SLOT SIZE	0.10 / PVC	10'	BACKFILL		no
RISER PIPE	2" / PVC	2'	WATER USED		no
GRADED SAND	#1	2 gallons	STEAM CLEANER		yes
PELLET BENTONITE					
GRANULAR BENTONITE	yes	.5 gallons			



Ground Water of Vermont

FIELD SUPERVISOR B. Storer
 CONTRACTOR Adams Engineering
 DRILLERS Jerry Adams

JOB LOCATION Ray's Auto
 DATE 5/21/96

DRILLING METHOD *vibratory* AND 40 - 50%
 BORING DIAMETER 2.375" SOME 10 - 40%
 TRACE 0 - 10% BORING LOCATION BORING #
 sketch on back or on-site plan mw-3
 with measurements TOTAL DEPTH
 12'

DEPTH	SAMPLES	SAMPLE NUMBER	BLOWS PER 6"					REC.	SAMPLE DESCRIPTION	STRAT CHG	PID Readings GENERAL DESCRIPTION ppm = parts per million	WELL DETAIL	DEPTH
			0	6	12	18	24						
								4.5	medium to coarse brown sand and small gravel		1.7 ppm	riser screen sand	
5'								4.0	↓ fine grey sand + silt		1.6 ppm		5'
									poorly sorted brown sand + gravel		0.8 ppm		10'
10'								3.0	↓				15'
15'													20'
20'													25'
25'													30'
30'													35'
35'													40'
40'													

MATERIALS USED	SIZE/TYPE	QUANTITY	MATERIALS USED	SIZE/TYPE	QUANTITY
WELL SCREEN	2" PVC	10'	GROUT	no	
SLOT SIZE	0.10" PVC	10'	BACKFILL	no	
RISER PIPE	2" PVC	2'	WATER USED	no	
GRADED SAND	#1	2 gallons	STEAM CLEANER	yes	
PELLET BENTONITE					
GRANULAR BENTONITE	yes	.5 gallons			

APPENDIX C

Laboratory Report Forms



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: GroundWater of Vermont
PROJECT NAME: Ray's Auto
REPORT DATE: June 4, 1996
DATE SAMPLED: May 28, 1996

PROJECT CODE: GWVT1898
REF.#: 89,569 - 89,573

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

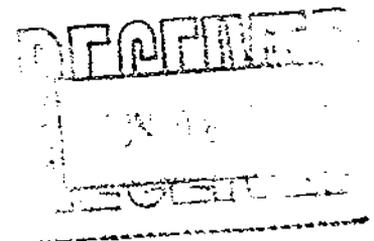
All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director



enclosures



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: GroundWater of Vermont
PROJECT NAME: Ray's Auto
REPORT DATE: June 4, 1996
DATE SAMPLED: May 28, 1996
DATE RECEIVED: May 29, 1996
DATE ANALYZED: May 31, 1996

PROJECT CODE: GWVT1898
REF.#: 89,569
STATION: Trip Blank
TIME SAMPLED: 5:00
SAMPLER: Brian Starer

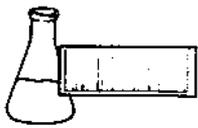
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	2.5
Xylenes	1	ND
MTBE	1	ND

Bromobenzene Surrogate Recovery: 93%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: GroundWater of Vermont
PROJECT NAME: Ray's Auto
REPORT DATE: June 4, 1996
DATE SAMPLED: May 28, 1996
DATE RECEIVED: May 29, 1996
DATE ANALYZED: May 31, 1996

PROJECT CODE: GWVT1898
REF.#: 89,570
STATION: MW-1
TIME SAMPLED: 10:00
SAMPLER: Brian Starer

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	50	125.
Chlorobenzene	50	ND ²
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	653.
Toluene	50	363.
Xylenes	50	6,190.
MTBE	50	ND

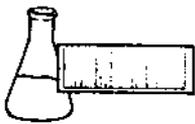
Bromobenzene Surrogate Recovery: 98%

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at a 2% dilution.

2 None detected



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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: GroundWater of Vermont
PROJECT NAME: Ray's Auto
REPORT DATE: June 4, 1996
DATE SAMPLED: May 28, 1996
DATE RECEIVED: May 29, 1996
DATE ANALYZED: May 31, 1996

PROJECT CODE: GWVT1898
REF.#: 89,571
STATION: MW-2
TIME SAMPLED: 9:30
SAMPLER: Brian Starer

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	5	ND ²
Chlorobenzene	5	ND
1,2-Dichlorobenzene	5	ND
1,3-Dichlorobenzene	5	ND
1,4-Dichlorobenzene	5	ND
Ethylbenzene	5	ND
Toluene	5	20.1
Xylenes	5	15.6
MTBE	5	ND

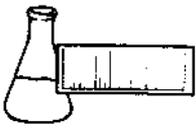
Bromobenzene Surrogate Recovery: 101%

NUMBER OF UNIDENTIFIED PEAKS FOUND: > 10

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at a 20% dilution.

2 None detected



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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: GroundWater of Vermont
PROJECT NAME: Ray's Auto
REPORT DATE: June 4, 1996
DATE SAMPLED: May 28, 1996
DATE RECEIVED: May 29, 1996
DATE ANALYZED: June 3, 1996

PROJECT CODE: GWVT1898
REF.#: 89,572
STATION: MW-3
TIME SAMPLED: 9:00
SAMPLER: Brian Starer

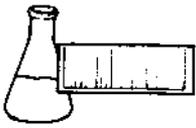
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	2.3
Xylenes	1	ND
MTBE	1	ND

Bromobenzene Surrogate Recovery: 96%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



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LABORATORY REPORT

EPA METHOD 8020--PURGEABLE AROMATICS

CLIENT: GroundWater of Vermont
PROJECT NAME: Ray's Auto
REPORT DATE: June 4, 1996
DATE SAMPLED: May 28, 1996
DATE RECEIVED: May 29, 1996
DATE ANALYZED: May 31, 1996

PROJECT CODE: GWVT1898
REF.#: 89,573
STATION: Duplicate (mw-1)
TIME SAMPLED: Not Indicated
SAMPLER: Brian Starer

<u>Parameter</u>	<u>Detection Limit (ug/L)¹</u>	<u>Concentration (ug/L)</u>
Benzene	50	109.
Chlorobenzene	50	ND ²
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	588.
Toluene	50	303.
Xylenes	50	6,430.
MTBE	50	ND

Bromobenzene Surrogate Recovery: 89%

NUMBER OF UNIDENTIFIED PEAKS FOUND: > 10

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at a 2% dilution.

2 None detected



Groundwater of Vermont

The Chase Hill, One Hill Street, Box C-5, Burlington, Vermont, 05401
(802) 860-6065 (802) 860-6076 Fax

CHAIN OF CUSTODY RECORD

LABORATORY PROJECT NUMBER: 096-037
 ANALYSIS STATUS: PROJECT NAME: Real Auto
RUSH (2-DAY) PROJECT LOCATION: Newport VT
PRIORITY (4-DAY) PROJECT MANAGER: Don Miller
 COLLECTED BY: Garret Stier
 BEST AVAILABLE TIME DATE: 5/28/96

GLVT 1898

ANALYSIS REQUESTED

METALS - PLEASE LIST: MA () EP-TOX () ()
OL & GREASE: IR () GRV. ()
VOLATILE ORGANICS: 524 () 601 () 602 () 8010 () 8015 () 8020 & MTBE (X)
EXTRACTABLES: ACIDS () 8-N () PCBs () PESTS () 605/6060 ()
TSS () TDS () PH () SPEC COND ()
BACTERIA: SPC () TOT COLI () FEC COLI ()
CYANIDE: AMEN () TOT ()
Cl () F () SO4 ()
NO3 () NO2 () NH3 ()
TEMP: METALS () VOLATILES () PESTICIDES () SEMIVOLATILES () HERBICIDES ()
OTHER:
OTHER:

SAMPLE ID	DATE	TIME	SAMPLE MATRIX	TYPE OF CONTAINER	# CONT.	PRESRVD
Trig Blect	5/28	500 A	W	VOA	2	I/A
mw-1		1000 A				
mw-2		930 A				
mw-3		900 A				
Duplicate						

REMARKS

89569
 89570
 89571
 89572
 89573

MATRIX

W = AQUEOUS
 S = SOLIDS

PRESERVATIVE

I = ICED
 A = ACIDIFIED (1.1 HCl drops)
 B = BASE
 N = SODIUM BISULFATE

RELINQUISHED BY

R. V. K.

DATE

5/29/96

TIME

8:50

RECEIVED BY

Ron Ben



GroundWater of Vermont

The Chace Mill, One Mill Street, Box C-5, Burlington, Vermont, 05401
(802)-860-6065 (802)-860-6076 Fax

CHAIN OF CUSTODY RECORD

LABORATORY

ANALYSIS STATUS:

- RUSH (2-DAY)
- PRIORITY (4-DAY)
- BEST AVAILABLE TIME

PROJECT NUMBER: 096-037
 PROJECT NAME: Route Auto
 PROJECT LOCATION: Newport, VT
 PROJECT MANAGER: Pan Miller
 COLLECTED BY: Brian Street
 DATE: 5/28/96

ANALYSIS REQUESTED

METALS - PLEASE LIST: NA () EP-TOX () (P)
 OIL & GREASE: IR () GRAV. ()
 VOLATILE ORGANICS: B24 () B21 () B22 () B20 & MTBE (X)
 8010 () 8015 () PCBs ()
 EXTRACTABLES: ACIDS () PH () PESTS ()
 TSS () TDS () PH () SPEC COND ()
 BACTERIA: SFC () TOT COU () FEC COU ()
 CYANIDE: AMEN () TOT ()
 CL () F () SO4 ()
 NO3 () NO2 () NH3 ()
 TELP: METALS () VOLATILES () PESTICIDES ()
 SEMI-VOLATILES () HERBICIDES ()
 OTHER
 OTHER

SAMPLE ID	DATE	TIME	SAMPLE MATRIX	TYPE OF CONTAINER	# CONT.	PRESRVD	METALS - PLEASE LIST: NA () EP-TOX () (P)	OIL & GREASE: IR () GRAV. ()	VOLATILE ORGANICS: B24 () B21 () B22 () B20 & MTBE (X) 8010 () 8015 () PCBs ()	EXTRACTABLES: ACIDS () PH () PESTS ()	TSS () TDS () PH () SPEC COND ()	BACTERIA: SFC () TOT COU () FEC COU ()	CYANIDE: AMEN () TOT ()	CL () F () SO4 ()	NO3 () NO2 () NH3 ()	TELP: METALS () VOLATILES () PESTICIDES () SEMI-VOLATILES () HERBICIDES ()	OTHER	OTHER	REMARKS	
Trip Blank	5/28	500 A	W	VOA	2	SIA			X											
mw-1		1000A							X											
mw-2		930A							X											
mw-3		900A							X											
Duplicate		-							X											

MATRIX
 W = AQUEOUS
 S = SOLIDS

PRESERVATIVE
 I = ICED
 A = ACIDIFIED (1% HCl 4 drops)
 B = BASE
 N = SODIUM BISULFATE

RELINQUISHED BY	DATE	TIME	RECEIVED BY
<i>Pan Miller</i>	5/29/96	3:50	<i>Ron Bar</i>