

JUL 11 1994



July 7, 1994

Mr. Chuck Schwer  
VT Department of Environmental Conservation  
Hazardous Materials Management Division  
103 South Main St.  
Waterbury, VT 05676

RE: Zorba's Mobil/ Mountain Mini Mart, Killington Access Road, Sherburne, VT  
VTDEC Site #93-1529

Dear Chuck:

Enclosed please find the July 1994 *Report on the Investigation of Suspected Subsurface Petroleum Contamination* for the above referenced site. Mr. Frank Trombetta of Midway Oil, Inc., has reviewed the report and requested that we forward a copy to you.

Should you have any questions, please do not hesitate to call.

Sincerely,

A handwritten signature in cursive script that reads 'Kristen Underwood'.

Kristen Underwood  
Hydrogeologist

Enc.

cc: Frank Trombetta  
GI 1944480

JUL 11 1994

**REPORT ON THE  
INVESTIGATION OF SUSPECTED SUBSURFACE  
PETROLEUM CONTAMINATION**

**AT**

**ZORBA'S MOBIL/ MOUNTAIN MINI MART  
KILLINGTON ACCESS ROAD, VERMONT**

VTDEC SITE #93-1529  
GRIFFIN PROJECT #1944480

**JULY 1994**

Prepared For:

**MIDWAY OIL COMPANY, INC.  
217 N. Main St.  
Rutland, VT 05701**

Prepared By:

***GRIFFIN INTERNATIONAL, INC.***  
P.O. Box 943  
Williston, Vermont 05495  
(802) 865-4288

JUL 19 1994

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## I. INTRODUCTION

This report provides a summary of the tasks completed for the preliminary investigation of suspected subsurface petroleum contamination at the Zorba's Mobil/ Mountain Mini Mart store (Zorba's Mobil) on the Killington Access Road in the town of Sherburne, Vermont (see Site Location Map in Appendix A). Results of the following investigative tasks performed by Griffin International, Inc., (Griffin) are presented: groundwater sampling and analyses; determination of groundwater flow direction; assessment of sensitive receptors in the vicinity of the Zorba's Mobil site. Also provided are conclusions and recommendations for additional investigation. This work is being performed based on requests from Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Mr. Frank Trombetta of Midway Oil Company, dated January 4, 1994. Work was performed in accordance with the January 17, 1994 *Preliminary Work Plan and Cost Estimate for Subsurface Investigation of Suspected Petroleum Contamination* (Work Plan) at the site prepared by Griffin and approved by the VTDEC.

## II. SITE BACKGROUND

Zorba's Mobil is located on the Killington Access Road approximately 1.75 miles southeast of the intersection of Routes 100 and 4 near Sherburne Center, Vermont. The area comprising the corridor along the Killington Access Road is predominantly commercial, bordered on either side by undeveloped forest land. Zorba's Mobil and Mountain Mini Mart store reside on the ground floor of a two-story commercial building; a restaurant occupies the second story.

A steep bank sloping upward to the south forms the southern border of the Zorba's Mobil property. A restaurant/lounge is located approximately 50 feet to the south of Zorba's Mobil. A small stream forms the approximate western and northern boundaries of the property. Beyond the stream to the west the land surface is forested and slopes steeply upward. Approximately 200 feet to the north of Zorba's Mobil is a ski shop; land surface slopes moderately downward to the north. Land is largely undeveloped to the east of Zorba's Mobil and the Killington Access Road. The topography slopes moderately to steeply downward to the small ravine formed by Roaring Brook.

The following four underground storage tanks were removed from a common tank pit at Zorba's Mobil on November 8 and 9, 1993, as part of a routine site upgrade project:

- 1) 6,000-gallon single-walled steel (SW, S) gasoline tank
- 2) 10,000-gallon SW, S, gasoline tank
- 3) 10,000-gallon SW, S, gasoline tank
- 4) 10,000-gallon SW, S, diesel tank

Each of the tanks was estimated to be approximately 15 years old; all were described as being in fair condition in the November 15, 1993 tank pull report prepared by Griffin. No holes or signs of petroleum product leakage were observed on the tanks at the tank pull inspection. As no obvious

signs of tank release(s) were identified, the petroleum contaminated soils in the vicinity of the tank pit may be attributable to pipe line leaks or small overfills. The old tanks were replaced with installation of (2) 10,000-gallon fiberglass lined steel tanks and (1) split fiberglass lined steel tank with a capacity of 4000 gallons on each side. Approximately 250 cubic yards of petroleum contaminated soils identified during the tank pull were replaced in the tank pit following installation of the new tanks.

### **III. INVESTIGATIVE PROCEDURES**

To determine the nature and extent of suspected subsurface petroleum contamination in the area of Zorba's Mobil, the following investigative tasks were undertaken as per the Work Plan: installation of three monitoring wells, site survey, determination of groundwater flow direction, groundwater sampling and analyses for petroleum-related constituents, and a sensitive receptor survey.

#### **A. Monitoring Well Installation**

On April 5, 1994, three shallow monitoring wells were installed at the site (see Site Map). Due to the abundance of large cobbles and boulders in subsurface deposits of this region, the wells were installed utilizing air rotary drilling methods. Cushing and Sons, Inc., of Keene, New Hampshire, installed the wells under direct supervision of a Griffin hydrogeologist. During borehole advancement, drill cuttings were screened for hydrocarbon vapors using an HNu<sup>TM</sup> Model HW-101 portable photoionization detector (PID). Soil characteristics and contaminant concentrations were recorded by the hydrogeologist in detailed well logs which are presented in Appendix B.

MW-1 was advanced to 13 feet below ground level, MW-2 to 10 feet, and MW-3 to 13 feet. Soils encountered in the boreholes of the three wells consisted generally of medium-brown, fine-grained sands and subrounded gravel of varying lithologies, with minor percentages of silt. Bedrock (micaceous schist) was encountered in MW-3 at an approximate depth of 3.5 feet below ground level. Soil and bedrock lithologies encountered in the three wells are largely consistent with the interpretations of the Surficial Geologic Map of Vermont (Doll, Charles G., 1970) and the Centennial Geologic Map of Vermont (Doll, Charles G., 1961).

A perched groundwater table was encountered in MW-1 at approximately 6 feet below ground level and in MW-2 at approximately 5 feet below ground level. Following removal of the air rotary bit from the MW-2 borehole, groundwater was observed flowing in from the north and northwest sides of the hole at an approximate rate of 2 gpm (visual estimate). The groundwater appeared to be following along the upper surface of a fragipan layer in the till deposits at a depth of approximately five feet below ground surface. Groundwater was encountered in bedrock at an approximate depth of 7 feet below ground level in MW-3.

A strong petroleum odor and dark gray petroleum staining was observed in the sand and gravel sediments obtained from six to thirteen feet in MW-1. The maximum PID reading obtained in a plastic bag headspace analysis of these sediments was approximately 220 ppm. No significantly elevated levels of volatile organic constituents (VOCs) were detected with the PID in soil and rock cuttings obtained from MW-2 or MW-3. Petroleum-contaminated soils encountered in MW-1 were polyencapsulated and stored on the property.

## **B. Determination of Groundwater Flow Direction**

The newly-installed monitoring wells and prominent site features were located in azimuth and elevation, relative to an arbitrary datum, during a site survey conducted on April 25, 1994. Survey data was utilized in generation of the Site Map contained in Appendix A.

Prior to groundwater sampling on April 25, 1994, each of the three wells was monitored for presence of free floating product, and depths to water were measured. Results are tabulated as Liquid Level Monitoring Data in Appendix C. For each well, the measured depth to water was subtracted from the surveyed elevation of the measurement reference point, to determine the water table elevation. Water table elevations were plotted on the site map to generate the Groundwater Contour Map presented in Appendix A. From this figure it can be seen that the groundwater flow is directed generally eastward from the site. A gradient of approximately 4.5% was calculated.

## **C. Groundwater Sampling and Analyses**

A groundwater sample was collected from each of the three monitoring wells on April 25, 1994. A sample from the supply well which services Zorba's Mobil was collected on June 9, 1994. Groundwater samples were analyzed by EPA Method 602 by Endyne, Inc. of Williston, Vermont. Quality control (QC) samples (a trip blank and duplicate sample) were also collected on April 25, 1994. As disposable bailers were used to collect samples from the wells, no equipment blank was collected. Analytical results are summarized in tabular form in Appendix D; drinking water standards are provided for reference in this summary table. Appendix D also contains the laboratory data sheets. Analytical results of the trip blank and duplicate sample indicate that adequate Quality Assurance/ Quality Control was maintained throughout sample collection and analyses.

Relatively low concentrations of ethylbenzene and total xylenes were detected in MW-1 and MW-2. In addition, benzene was detected at a relatively low concentration in MW-2. Methyl tert butyl ether (MTBE) was detected in MW-2 and MW-3. None of the targeted petroleum-related constituents were detected in the Zorba's Mobil supply well. Constituent concentrations detected in the monitoring wells were plotted on the site map to generate the Contaminant Distribution Map contained in Appendix A. The contaminant distribution pattern is consistent with the interpretation of groundwater flow direction indicated by April 25, 1994 water level elevation.

data. MW-1, the downgradient well, contained the highest concentrations of petroleum-related constituents.

Detected concentrations were below the respective EPA Maximum Contaminant Levels (MCLs) for these constituents. It should be noted that sample-specific detection limits were elevated in the analyses of the primary sample and duplicate sample collected from MW-1, due to the levels of contaminants in these samples. The detection limits for benzene and MTBE, in particular, were elevated above their respective EPA MCL and VT Health Advisory Limit (VT HAL). Thus, there is the potential that these constituents could have been present at concentrations above their respective drinking water standards.

#### IV. RISK ASSESSMENT

The area surrounding Zorba's Mobil was evaluated during the site visit conducted on April 5, 1994, to identify potentially sensitive receptors in the vicinity of the site. In addition, a review of State of Vermont files at the Agency of Natural Resources, Water Supply Division offices in Waterbury, Vermont was conducted on January 18, 1994, to identify the location of supply wells in the area of Zorba's Mobil. Several supply wells are located within one mile of the site. However, available construction specifications indicate that they are all bedrock wells; most of the well records indicated that the wells contained surface casing through the overburden deposits. Risk to these water supplies posed by the subsurface petroleum contamination at Zorba's Mobil is likely to be minimal given the constructions of area wells and the apparent limited extent of petroleum contamination at the site.

Zorba's Mobil is supplied by a bedrock well reportedly located up slope to the south of the building. A sample of groundwater from this supply well was collected from a spigot located on an outside wall of the building on June 9, 1994. No petroleum-related constituents were detected in this sample.

The only building present on the site consists of the two-story building occupied by Zorba's Mobil/ Mountain Mini Mart on the ground floor and by a restaurant on the second floor. This building is constructed on a concrete slab; no floor drains were observed. No organic vapors were detected with the PID inside the building on April 25, 1994. Due to the absence of petroleum vapors inside the building and the absence of a basement, there appears to be negligible risk to the Zorba's Mobil building posed by suspected petroleum releases in the nearby tank pit. Several commercial buildings, including restaurants, motels, and specialty shops, and a few residences are located along the Killington Access Road. The closest buildings to Zorba's Mobil include a ski shop located approximately 200 feet to the north, and a restaurant/lounge approximately 50 feet to the south. Given the apparent limited extent and degree of subsurface petroleum contamination at the site, and given that the restaurant/lounge is topographically and hydraulically upgradient of the site, the likely potential impact of subsurface petroleum contamination to these two nearby buildings is minimal.

On April 5, 1994, the small unnamed stream which flows along the western and northern property boundaries was observed for signs of petroleum contamination. On this date, the stream was exposed under stockpiled snow in only two locations: in an approximately ten-foot reach northwest of the Zorba's Mobil building and in an approximately 20-foot reach west of the building. Rate of flow in the stream was observed to be approximately eight to ten gallons per minute (visual estimate). Each reach of the stream was screened with the PID; no elevated VOCs were detected. No petroleum sheens were visible on the water surface or on the surface of soils adjacent to the stream. Following analysis of water level data obtained on April 5, 1994, it is apparent that groundwater flow direction at the site, and thus petroleum constituent migration, is directed eastward away from the stream, at least on the measurement date.

## **V. CONCLUSIONS**

Based upon results of the above investigative tasks, Griffin presents the following conclusions:

- 1) No free phase product was detected in the three monitoring wells located in close proximity to the tank pit.
- 2) Dissolved petroleum contamination was detected in the three on-site monitoring wells; concentrations were relatively low and below applicable EPA MCLs and VT HALs.
- 3) There are no apparent sensitive receptors to the subsurface petroleum contamination in the vicinity of Zorba's Mobil.
- 4) Over time, natural renovative processes (dilution, dispersion, biodegradation, etc.) will reduce contaminant concentrations to below detectable limits. The relatively high permeability soils in the perched aquifer will allow this to occur quickly, and likely have already done so to some degree.

## **VI. RECOMMENDATIONS**

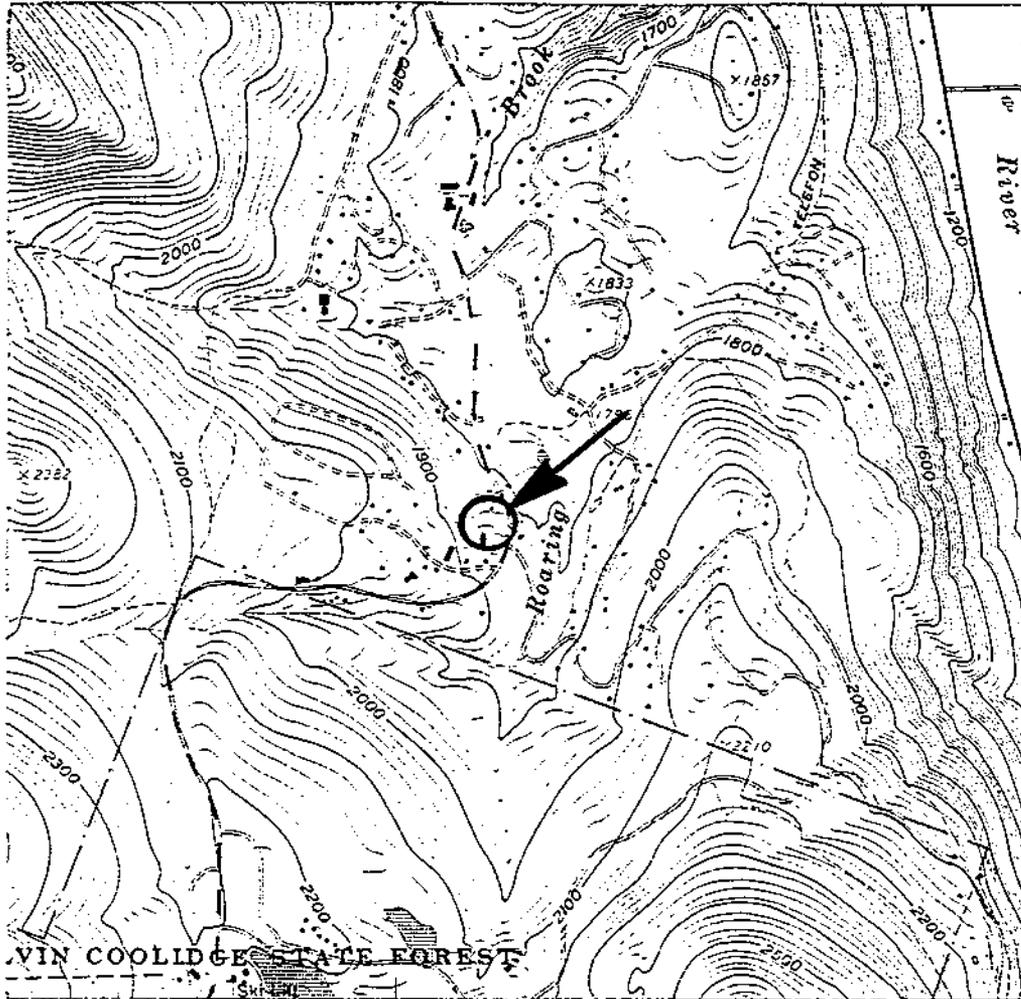
Based upon the above conclusions, Griffin offers the following recommendations:

- 1) Groundwater from wells MW-1, MW-2, and MW-3 should be sampled and analyzed once more by EPA Method 602 for presence of petroleum-related constituents, to confirm April 25, 1994 results. If constituents are again detected at levels below applicable Drinking Water Standards, the site should be considered for closure.

2) Polyencapsulated petroleum-contaminated soils on the property should be screened with a PID and turned over periodically to track expected decreases in VOC concentrations with the progressive action of natural degradative processes including volatilization and biodegradation.

**APPENDIX A**

**Site Maps**



JOB #: 1944480  
 SOURCE: USGS- PICD PEAK QUADRANGLE, PHOTOREVISED 1980



ZORBA'S MOBIL/MIDWAY OIL  
 SHERBURNE, VERMONT

SITE LOCATION MAP

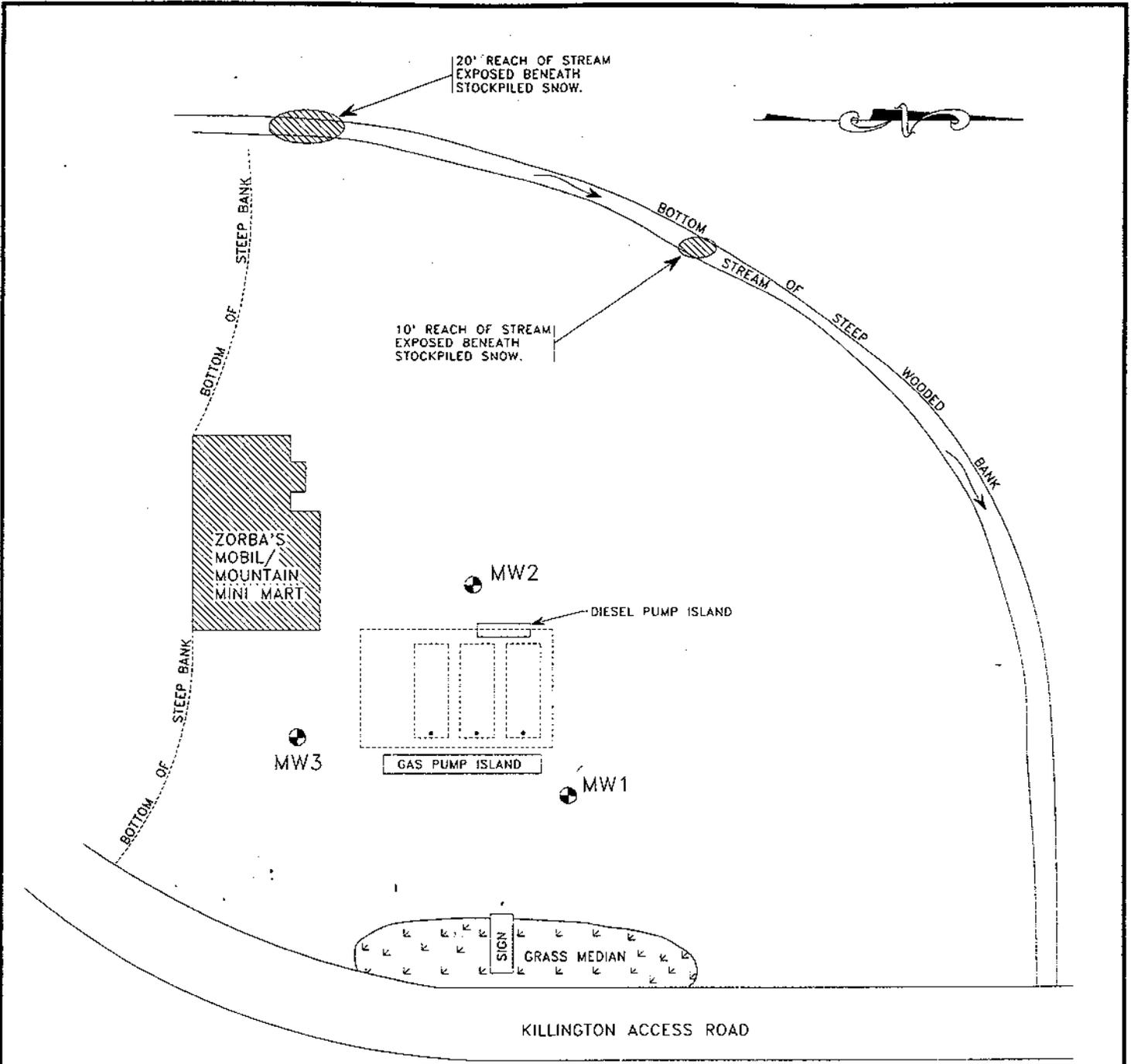
DATE 5/18/94

DWE#1

SCALE 1:24000

DRN: SB

APP: KLU



LEGEND

-  MW2 MONITORING WELL
-  UNDERGROUND STORAGE TANK

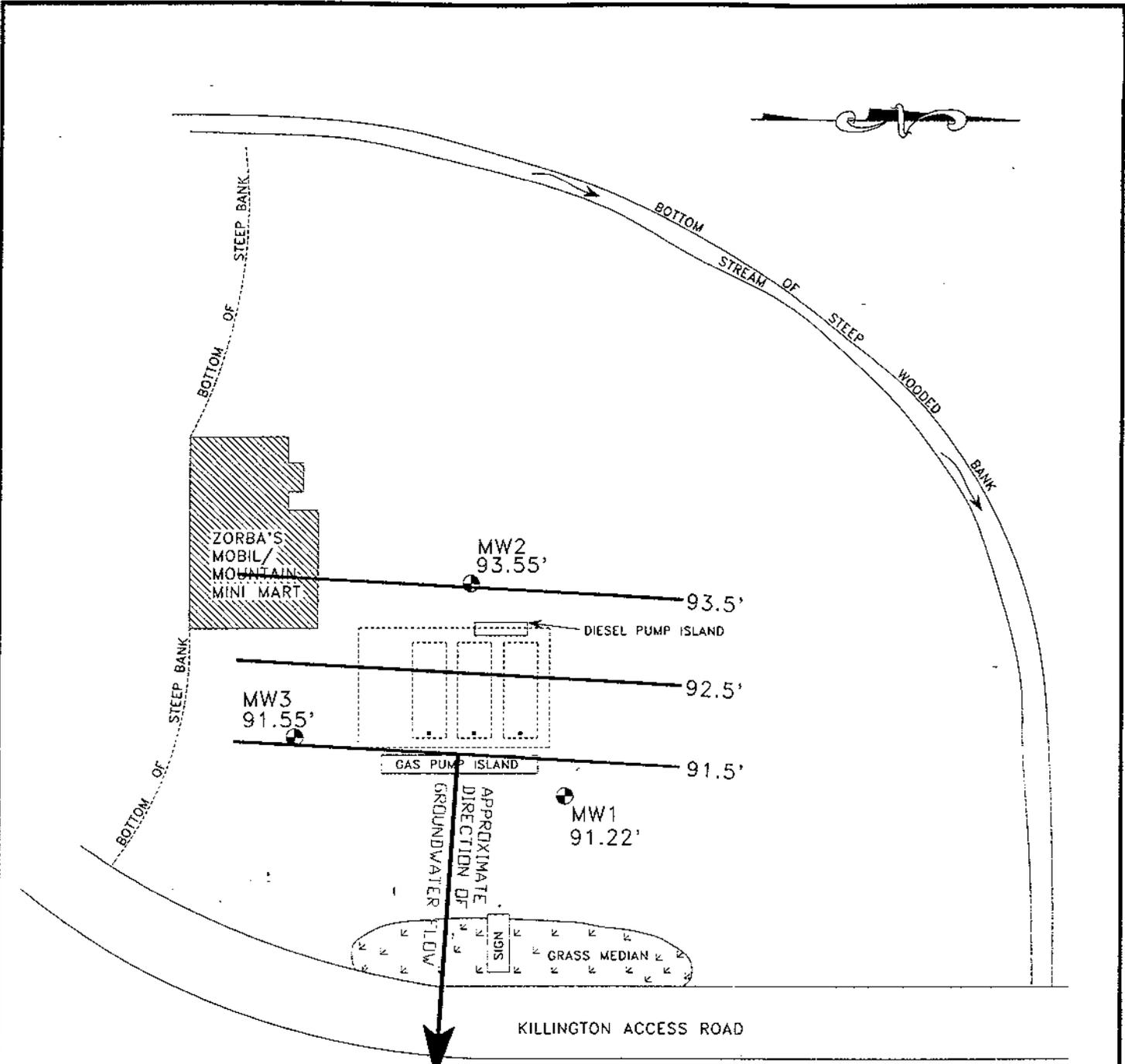
JEB #: 1944480



ZORBA'S MOBIL/MIDWAY OIL  
 SHERBURNE, VERMONT

SITE MAP

DATE 4/25/94	DWG.#: 2	SCALE: 1"=40'	DRN: SB	APP: KU
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**LEGEND**

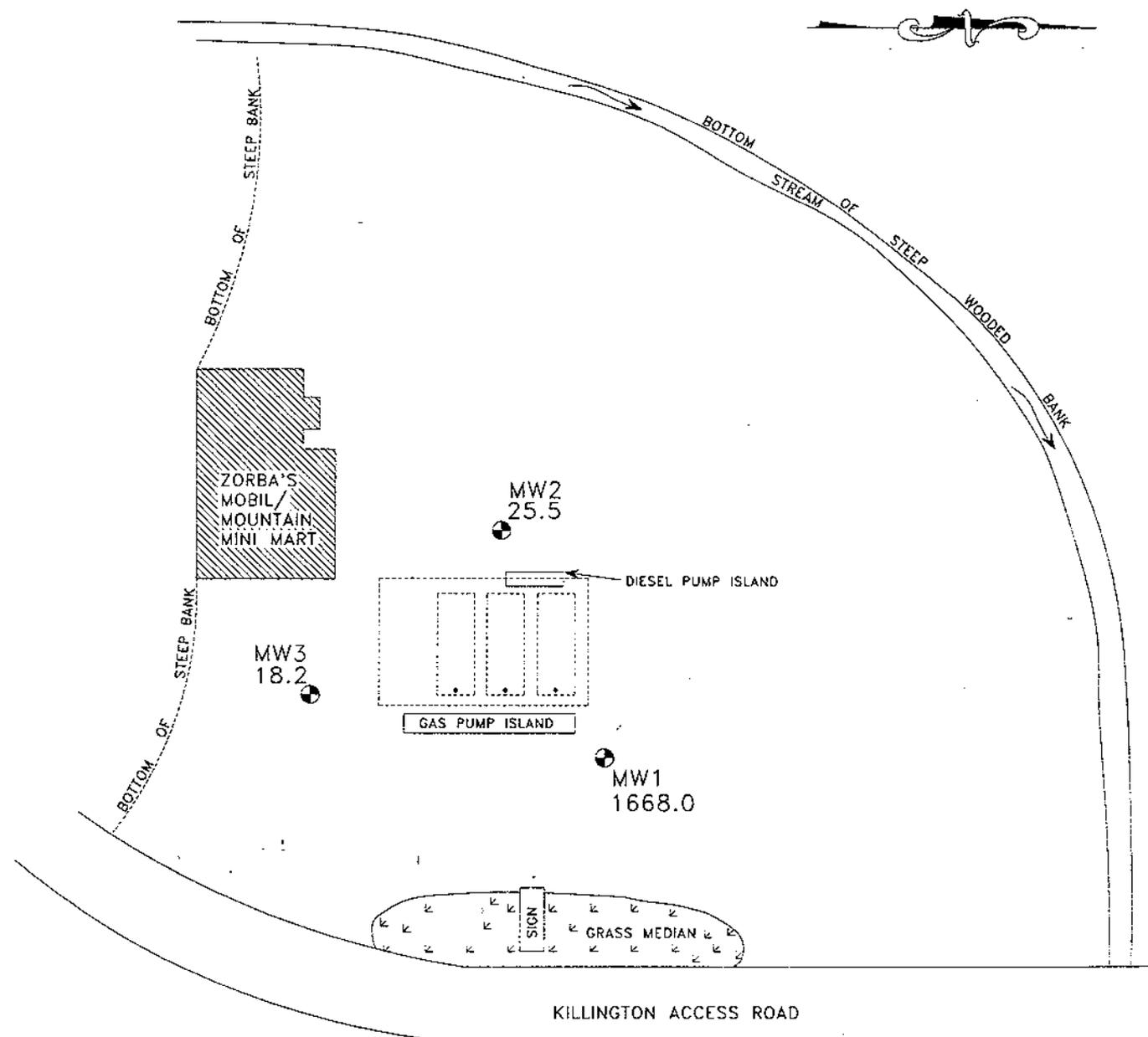
- 
 MW2 93.55' MONITORING WELL AND WATER TABLE ELEVATION IN FEET
- 
 GROUNDWATER CONTOUR
- 
 UNDERGROUND STORAGE TANK

JOB #: 1944480  
 DATE MEASURED: 4/25/94



**ZORBA'S MOBIL/MIDWAY OIL**  
**SHERBURNE, VERMONT**  
**GROUNDWATER CONTOUR MAP**

DATE: 4/25/94	DWG.#: 3	SCALE: 1"=40'	DRN: SB APP:KU
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**LEGEND**

-  MW2 25.5 MONITORING WELL WITH I.D. AND BTEX+MTBE CONCENTRATION (PPB)
-  UNDERGROUND STORAGE TANK

JOB #: 1944480  
DATE MEASURED: 4/25/94



**ZORBA'S MOBIL/MIDWAY OIL**  
**SHERBURNE, VERMONT**  
**CONTAMINANT DISTRIBUTION MAP**

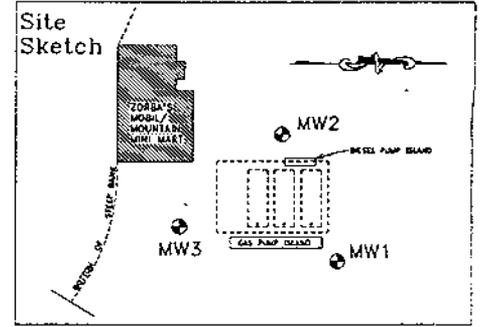
DATE: 5/18/94	DWG#: 4	SCALE 1"=40'	DRN. SB	APP. KU
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**APPENDIX B**

**Monitoring Well Logs**

PROJECT ZORBA'S MOBIL/MINI MART  
 LOCATION KILLINGTON ACCESS ROAD, SHERBURNE, VT.  
 DATE DRILLED 4/5/94 TOTAL DEPTH OF HOLE 13.0'  
 DIAMETER 6"  
 SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"  
 CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc  
 DRILLING CO. CUSHING DRILLING METHOD AIR ROTARY  
 DRILLER BOB MANN LOG BY K. UNDERWOOD

WELL NUMBER MW1

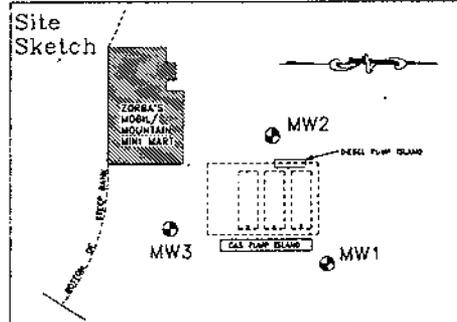


GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0	ROAD BOX LOCKING WELL CAP				0
1	CONCRETE			Pavement	1
2	BENTONITE				2
3	WELL RISER		0.1'-6.0' 220 ppm	Medium brown, fine grained SAND and gravel, some silt, dry	3
4					4
5					5
6				6.0' WATER TABLE	6
7	NO. 0 MORIE SAND PACK				7
8			6.0'-13.0' >200 ppm	Medium brown, fine grained SAND and gravel, some silt, with strong petroleum odor, wet, dark gray petroleum staining	8
9	WELL SCREEN				9
10					10
11					11
12	BOTTOM CAP				12
13	UNDISTURBED NATIVE SOIL			BASE OF WELL AT 13' END OF EXPLORATION AT 13'	13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT ZORBA'S MOBIL/MINI MART  
 LOCATION KILLINGTON ACCESS ROAD, SHERBURNE, VT.  
 DATE DRILLED 4/5/94 TOTAL DEPTH OF HOLE 10'  
 DIAMETER 6"  
 SCREEN DIA. 2" LENGTH 7' SLOT SIZE 0.010"  
 CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc  
 DRILLING CO. CUSHING DRILLING METHOD AIR ROTARY  
 DRILLER BOB MANN LOG BY K. UNDERWOOD

WELL NUMBER MW2

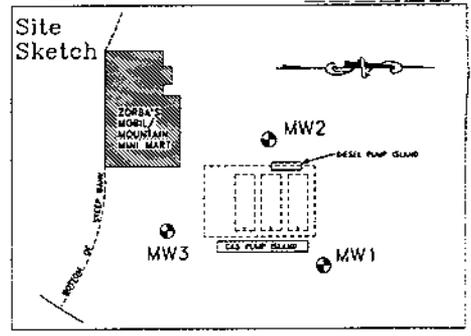


GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0	ROAD BOX LOCKING WELL CAP				0
1	CONCRETE				1
2	BENTONITE		0'-5.0' 0.2 ppm	Medium brown fine grained SAND, with subrounded gravel, some silt, dry, no petroleum odor	2
3	WELL RISER				3
4					4
5	NO. 0 MORIE SAND PACK			5.0' WATER TABLE	5
6	WELL SCREEN				6
7			5.0'-10.0'	5.0'-10.0' "HARD PAN" greenish brown fine grained SAND, some silt, wet	7
8					8
9	BOTTOM CAP				9
10	UNDISTURBED NATIVE SOIL			BASE OF WELL AT 10' END OF EXPLORATION AT 10'	10
11					11
12					12
13					13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT ZORBA'S MOBIL/MINI MART  
 LOCATION KILLINGTON ACCESS ROAD, SHERBURNE, VT.  
 DATE DRILLED 4/5/94 TOTAL DEPTH OF HOLE 13.0'  
 DIAMETER 6"  
 SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"  
 CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc  
 DRILLING CO. CUSHING DRILLING METHOD AIR ROTARY  
 DRILLER BOB MANN LOG BY K. UNDERWOOD

WELL NUMBER MW3



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0	ROAD BOX LOCKING WELL CAP				0
0-1	CONCRETE		0'-0.1'	Pavement	1
1-2	BENTONITE				2
2-3	WELL RISER			Medium brown SAND and GRAVEL, some silt, dry, no petroleum odor	3
3-4			0.1'-7.0' 0.1 ppm above background		4
4-13	NO. 0 MORIE SAND PACK			3.5'-13' - Bedrock micaceous SCHIST with quartz porphyroblasts, trace graphite, no petroleum odor.	5
7	WELL SCREEN			7.0' WATER TABLE	7
12	BOTTOM CAP				12
13	BEDROCK			BASE OF WELL AT 13' END OF EXPLORATION AT 13'	13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

**APPENDIX C**

**Liquid Level Data**

**Liquid Level Monitoring Data  
Zorba's Mobil/ Mountain Mini Mart  
Sherburne, Vermont**

**Monitoring Date: April 25, 1994**

Well I.D.	Well Depth (ft)	Top of Casing Elevation (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Specific Gravity of Product	Hydro Equivalent (ft)	Corrected Depth To Water (ft)	Corrected Water Table Elevation (ft)
MW-1	-	98.29	-	7.07	-	0.88	-	-	91.22
MW-2	-	98.73	-	5.18	-	0.88	-	-	93.55
MW-3	-	100.00	-	8.45	-	0.88	-	-	91.55

**APPENDIX D**

**Groundwater Quality Data**

**Groundwater Quality Summary  
Zorba's Mobil/ Mountain Mini Mart  
Sherburne, Vermont**

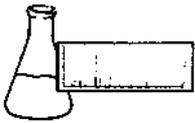
Sample Date:	Quality Control Samples						Drinking Water Standards
	4/25/94	4/25/94	4/25/94	6/9/94	4/25/94	4/25/94	
Sample Location:	MW-1	MW-2	MW-3	Zorba's Supply Well	Trip Blank	Duplicate (MW-1)	
PARAMETER							
Benzene	ND	3.1	ND	ND	ND	ND	5.0 *
Chlorobenzene	ND	ND	ND	ND	ND	ND	100 *
1,2-DCB	ND	ND	ND	ND	ND	ND	600 *
1,3-DCB	ND	ND	ND	ND	ND	ND	600 **
1,4-DCB	ND	ND	ND	ND	ND	ND	75 *
Ethylbenzene	268.	1.3	ND	ND	ND	269.	700 *
Toluene	ND	TBQ	ND	ND	ND	ND	1,000 *
Xylenes	1400.	1.6	ND	ND	ND	1440.	10,000 *
Total BTEX	1668.	6.0	ND	ND	ND	1709.	-
MTBE	ND	19.5	18.2	ND	ND	ND	40 **
BTEX+MTBE	1668.	25.5	18.2	ND	ND	1709.	-

All values reported in ug/L (ppb)

ND - None Detected

\* - EPA Maximum Contaminant Level

\*\* - VT Health Advisory Levels



**ENDYNE, INC.**

**Laboratory Services**

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

**REPORT OF LABORATORY ANALYSIS**

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: May 9, 1994  
DATE SAMPLED: April 25, 1994

PROJECT CODE: GIZM1378  
REF.#: 58,713 - 58,717

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated samples were preserved 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.

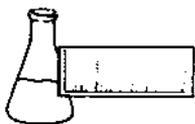
Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

RECEIVED MAY 13 1994

enclosures



**ENDYNE, INC.**

Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: May 9, 1994  
DATE SAMPLED: April 25, 1994  
DATE RECEIVED: April 26, 1994  
ANALYSIS DATE: May 6, 1994

PROJECT CODE: GIZM1378  
REF.#: 58,713  
STATION: MW-1  
TIME SAMPLED: 12:58  
SAMPLER: Erik Sandblom

<u>Parameter</u>	<u>Detection Limit (ug/L)<sup>1</sup></u>	<u>Concentration (ug/L)</u>
Benzene	50	ND <sup>2</sup>
Chlorobenzene	50	ND
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	268.
Toluene	50	ND
Xylenes	50	1,400.
MTBE	500	ND

Bromobenzene Surrogate Recovery: 90%

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

NOTES:

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

2 None detected



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FAX 879-7103

LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: May 9, 1994  
DATE SAMPLED: April 25, 1994  
DATE RECEIVED: April 26, 1994  
ANALYSIS DATE: May 5, 1994

PROJECT CODE: GIZM1378  
REF.#: 58,714  
STATION: MW-2  
TIME SAMPLED: 12:15  
SAMPLER: Erik Sandblom

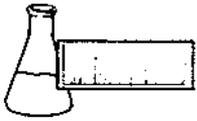
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	3.1
Chlorobenzene	1	ND <sup>1</sup>
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	1.3
Toluene	1	TBQ <sup>2</sup>
Xylenes	1	1.6
MTBE	10	19.5

Bromobenzene Surrogate Recovery: 90%

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

NOTES:

- 1 None detected
- 2 Trace below quantitation limit



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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: May 9, 1994  
DATE SAMPLED: April 25, 1994  
DATE RECEIVED: April 26, 1994  
ANALYSIS DATE: May 5, 1994

PROJECT CODE: GIZM1378  
REF.#: 58,715  
STATION: MW-3  
TIME SAMPLED: 12:33  
SAMPLER: Erik Sandblom

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND <sup>1</sup>
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	18.2

Bromobenzene Surrogate Recovery: 87%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



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**LABORATORY REPORT**

**EPA METHOD 602--PURGEABLE AROMATICS**

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: May 9, 1994  
DATE SAMPLED: April 25, 1994  
DATE RECEIVED: April 26, 1994  
ANALYSIS DATE: May 6, 1994

PROJECT CODE: GIZM1378  
REF.#: 58,716  
STATION: Duplicate (MW-1)  
TIME SAMPLED: 12:58  
SAMPLER: Erik Sandblom

<u>Parameter</u>	<u>Detection Limit (ug/L)<sup>1</sup></u>	<u>Concentration (ug/L)</u>
Benzene	50	ND <sup>2</sup>
Chlorobenzene	50	ND
1,2-Dichlorobenzene	50	ND
1,3-Dichlorobenzene	50	ND
1,4-Dichlorobenzene	50	ND
Ethylbenzene	50	269.
Toluene	50	ND
Xylenes	50	1,440.
MTBE	500	ND

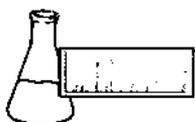
Bromobenzene Surrogate Recovery: 96%

NUMBER OF UNIDENTIFIED PEAKS FOUND: >10

**NOTES:**

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

2 None detected



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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: May 9, 1994  
DATE SAMPLED: April 25, 1994  
DATE RECEIVED: April 26, 1994  
ANALYSIS DATE: May 4, 1994

PROJECT CODE: GIZM1378  
REF.#: 58,717  
STATION: Trip Blank  
TIME SAMPLED: 8:55  
SAMPLER: Erik Sandblom

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND <sup>1</sup>
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 93%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

**CHAIN-OF-CUSTODY RECORD**

09900

Project Name: <u>Zorbris Mobil</u> Site Location: <u>Sherburne, VT</u>	Reporting Address: <u>PO Box 943</u> <u>Williston, VT 05495</u>	Billing Address: <u>P.O. Box 943</u> <u>Williston, VT 05495</u>
Endyne Project Number: <u>G12M1378</u>	Company: <u>GRIFFIN INTERNATIONAL</u> Contact Name/Phone #: <u>E. Sandblom / 865-4288</u>	Sampler Name: <u>Erik Sandblom</u> Phone #: <u>865-4288</u>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
58 713	MW-1	H <sub>2</sub> O	X		4/25/94 12:58	2	40ml		EPA 602	HC1	
58 714	MW-2				12:15	2	40ml				
58 715	MW-3				12:33	2	40ml				
58 716	Duplicate (MW-1)				12:58	2	40ml				
58 717	Trip Blank				8:55	2	40ml				

Relinquished by: Signature <u>[Signature]</u>	Received by: Signature <u>AR.M.T. [Signature]</u>	Date/Time <u>4/25/94 1700</u>
Relinquished by: Signature	Received by: Signature	Date/Time <u>04/26/94 10:05am</u>

**Requested Analyses**

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

### CHAIN-OF-CUSTODY RECORD

09900

Project Name: <u>Zerbris Mobil</u> Site Location: <u>Shepherds, VT</u>	Reporting Address: <u>PO Box 943</u> <u>Williston, VT 05495</u>	Billing Address: <u>P.O. Box 943</u> <u>Williston, VT 05495</u>
Endyne Project Number:	Company: <u>GRIFFIN INTERNATIONAL</u> Contact Name/Phone #: <u>E. Sandblom / 866-4288</u>	Sampler Name: <u>Erik Sandblom</u> Phone #: <u>866-4288</u>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time <u>4/25/94</u>	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
	<u>MW-1</u>	<u>H<sub>2</sub>O</u>	<u>X</u>		<u>12:58</u>	<u>2</u>	<u>40ml</u>		<u>EPA 102</u>	<u>HCl</u>	
	<u>MW-2</u>				<u>12:15</u>	<u>2</u>	<u>40ml</u>				
	<u>MW-3</u>				<u>12:33</u>	<u>2</u>	<u>40ml</u>				
	<u>Duplicate (MW-1)</u>				<u>12:58</u>	<u>2</u>	<u>40ml</u>				
	<u>Tap Blank</u>				<u>8:55</u>	<u>2</u>	<u>40ml</u>				

Relinquished by: Signature <u>[Signature]</u>	Received by: Signature <u>de.M.T. [Signature]</u>	Date/Time <u>4/25/94 1700</u>
Relinquished by: Signature	Received by: Signature	Date/Time <u>4/26/94 10:05am</u>

#### Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										



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REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: June 17, 1994  
DATE SAMPLED: June 9, 1994

PROJECT CODE: GIZM1969  
REF.#: 60,618

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated samples were preserved 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.

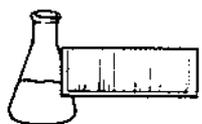
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

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



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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International  
PROJECT NAME: Zorba's Mobil  
REPORT DATE: June 17, 1994  
DATE SAMPLED: June 9, 1994  
DATE RECEIVED: June 10, 1994  
ANALYSIS DATE: June 16, 1994

PROJECT CODE: GIZM1969  
REF.#: 60,618  
STATION: Supply Well  
TIME SAMPLED: 13:40  
SAMPLER: J. Bernhard

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND <sup>1</sup>
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 97%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

**CHAIN-OF-CUSTODY RECORD**

10597

Project Name: <i>Zosbas Mobil</i>	Reporting Address: <i>Griffin</i>	Billing Address: <i>Griffin</i>
Site Location: <i>Killington, VT</i>		
Endyne Project Number: <i>012M/19109</i>	Company: <i>Griffin</i>	Sampler Name: <i>v.f. [unclear]</i>
	Contact Name/Phone #: <i>865-4288</i>	Phone #: <i>same</i>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
<i>60618</i>	<i>Supply well</i>	<i>H<sub>2</sub>O</i>	<i>X</i>		<i>6-9-94</i> <i>13:40</i>	<i>2</i>	<i>40ml</i>		<i>602</i>	<i>1-K1</i>	

Relinquished by: Signature <i>John B. [unclear]</i>	Received by: Signature <i>Carol C. Eddy</i>	Date/Time <i>6/9/94</i>
Relinquished by: Signature <i>Carol C. Eddy</i>	Received by: Signature <i>[unclear]</i>	Date/Time <i>6/9/94</i>

**Requested Analyses**

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

**CHAIN-OF-CUSTODY RECORD**
**10597**

Project Name: <i>Zosha's Mill</i>	Reporting Address: <i>Griffin</i>	Billing Address: <i>Griffin</i>
Site Location: <i>Killington, VT</i>		
Endyne Project Number:	Company: <i>Griffin</i>	Sampler Name: <i>J. Beardwood</i>
	Contact Name/Phone #: <i>865-4258</i>	Phone #: <i>same</i>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
	<i>supply well</i>	<i>H<sub>2</sub>O</i>	<i>X</i>		<i>6-9-94</i> <i>11:40</i>	<i>2</i>	<i>40ml</i>		<i>602</i>	<i>17C1</i>	

Relinquished by: Signature <i>John B...</i>	Received by: Signature <i>John C. Eddy</i>	Date/Time <i>6/9/94 8:30 AM</i>
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Relinquished by: Signature <i>John C. Eddy</i>	Received by: Signature <i>John C. Eddy</i>	Date/Time <i>6/9/94 10:30 AM</i>
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**Requested Analyses**

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										