

Oct 3 10 03 AM '97

**GROUNDWATER
MONITORING REPORT**

SEPTEMBER 29, 1997

Site Location:

**SHATNEY'S GARAGE
VT ROUTE 14
WOODBURY, VERMONT 05681**

VT DEC Site #96-2087

Prepared For:

**MR. BRIAN SHATNEY
SHATNEY'S GARAGE
P.O. BOX 108
WOODBURY, VERMONT 05681**

Prepared By:



P.O. Box 943 / 19 Commerce Street Williston, VT 05495 (802) 865-4288

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I. INTRODUCTION

The following report summarizes groundwater monitoring conducted at Shatney's Garage located on Route 14 in Woodbury, Vermont. This work has been conducted by Griffin International, Inc. (Griffin) for Mr. Brian Shatney of Shatney's Garage following a request from the Vermont Department of Environmental Conservation (VTDEC). The request came in a letter from Ms. Linda Elliott of the VTDEC, addressed to Mr. Shatney, dated December 5, 1997.

Work conducted at the site includes the collection and laboratory analysis of groundwater samples from two monitoring wells located at the site and one on-site water supply well, and the measurement of groundwater elevation. A third groundwater monitoring well located to the west of the subject property was originally scheduled to be sampled with the other two; however, this well was omitted from the sampling schedule following negotiations between Mr. Shatney and the VTDEC.

II. GROUNDWATER ELEVATION MEASUREMENT

A Griffin field technician measured the depth to product and depth to water in monitoring wells MW-5 and MW-6 on August 7, 1997. Liquid depths in the wells were measured with an interface probe. The depth to water measurements were subtracted from the top of casing elevations, which have been surveyed relative to an arbitrary datum of 100 feet at top of the casing for MW-1, located on the property of the Woodbury Country Store, to determine the water table elevation at each of the wells. No free floating petroleum product was detected in either of the wells.

As water elevation was only determined in two groundwater monitoring wells, groundwater flow direction and gradient were not determined for this round of groundwater monitoring. Groundwater elevations must be known in a minimum of three locations, configured in an approximately triangular shape, in order to estimate average groundwater flow direction and gradient. According to historic measurements collected from this site and the neighboring Woodbury Country Store, groundwater typically flows to the west at Shatney's Garage, toward the Buck Lake Brook, at an average gradient of 1.5% to 2.5%.

III. GROUNDWATER SAMPLE COLLECTION AND ANALYSIS

Immediately following depth to water data collection, samples of the groundwater were collected from monitoring wells MW-5 and MW-6. Samples were analyzed for target volatile organic compounds (VOCs) per EPA Method 602, which tests for benzene, toluene, ethyl benzene, xylenes (BTEX), and methyl tertiary butyl ether (MTBE), common constituents of petroleum products. Results of the laboratory analyses for the monitoring wells sampled on August 7, 1997, are summarized with historical groundwater quality data in Appendix B.

According to the results of the sample analyses, dissolved petroleum contamination continues to be present in groundwater in the vicinity of the site. Petroleum contaminants detected in samples collected from monitoring well MW-5 were at concentrations below applicable state groundwater standards. The historical water quality data for this well indicates that petroleum contamination levels are remaining relatively stable. Petroleum contamination detected in samples collected from MW-6 had been increasing from July of 1995 to August of 1996, but appear to have remained stable over the past year. Select contaminant concentrations detected in MW-6 are greater than state standards.

All samples were collected with the use of disposable bailers in accordance with Griffin's Groundwater Sampling Protocol which complies with industry and state standards. Results from the analyses of the duplicate and trip blank samples indicate that adequate quality assurance and control (QA/QC) were maintained during sample collection and analysis.

IV. SUPPLY WELL SAMPLE COLLECTION AND ANALYSIS

A sample of the water supply for Shatney's Garage was collected for analysis on the same day as groundwater sample collection. The site and adjacent residence, occupied by the Shatney's, both receive their water supply from a drilled well located on the east side of the subject property. The sample was collected from the outdoor spigot at the Shatney residence on this day and analyzed per EPA Method 602. Results of the laboratory analyses are summarized in Appendix C.

According to the sample analysis results, MTBE was detected in the sample collected from the Shatney supply well, at a concentration below the Vermont Health Advisory Level (VHAL), which is 40 parts per billion (ppb). This well is reportedly not used for human consumption.

V. CONCLUSIONS

Based on the August, 1997 groundwater monitoring data collected for Shatney's Garage in Woodbury, Vermont, the following conclusions are presented:

- 1) Dissolved petroleum contamination continues to be present in the overburden aquifer at Shatney's Garage, as evidenced by analysis results for groundwater samples collected from MW-5 and MW-6. Petroleum contamination levels in the vicinity of Shatney's garage appear to have maintained a relatively stable concentration since the last round of groundwater sample collection and analysis one year earlier.
- 2) Based on drilling data, groundwater quality data, and test pit screening conducted in November of 1996, the source of petroleum contamination at the subject property is likely from a former underground storage tank (UST) system which was used to store and

dispense gasoline at the site for retail sale. This system was permanently closed and removed from the ground in 1987.

- 3) Low concentrations of petroleum contamination have been detected in the Shatney supply well. Historical water quality data indicate that MTBE has been detected in this well at concentrations greater than the VHAL for this compound. The most recent data indicate MTBE concentrations in this well that are below the VHAL.
- 4) Since no identified sources or potential sources of petroleum contamination to the subsurface currently remain, petroleum contaminant concentrations will likely eventually decrease at the site, and the vicinity, due to the natural processes of dilution, dispersion, and biodegradation.

VI. RECOMMENDATIONS

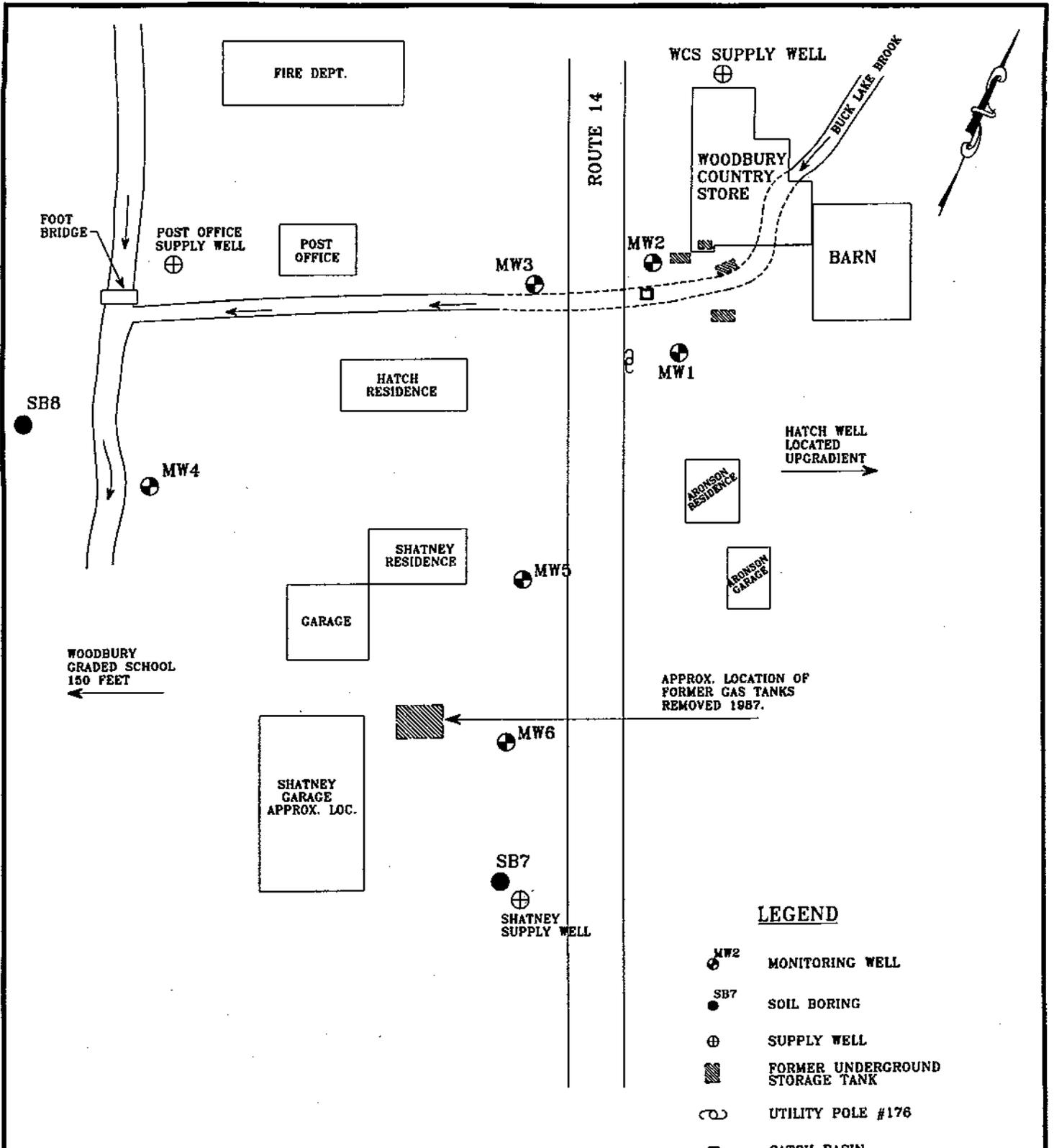
Based on the above conclusions, Griffin recommends the following actions concerning petroleum contamination at Shatney's Garage in Woodbury, Vermont.

- 1) Groundwater samples should be collected for analysis from monitoring wells MW-5 and MW-6 in another year's time in order to document the expected eventual decrease in petroleum contaminant concentrations in these wells.
- 2) Groundwater elevation measurements should be collected for MW-4, MW-5, and MW-6 in order to determine groundwater flow direction and gradient at the time of groundwater sample collection.
- 3) Based on the detection of MTBE in the Shatney Garage supply well, this water should not be used for consumption. An activated carbon adsorption system should be installed at the Shatney Garage to remove petroleum contamination from the water supply for the building in order to prevent exposure to petroleum contamination in this well. The water quality of the Shatney well should continue to be monitored on an annual basis.

APPENDIX A

SITE MAPS

- 1) Site Map**
- 2) Groundwater Elevation Map**

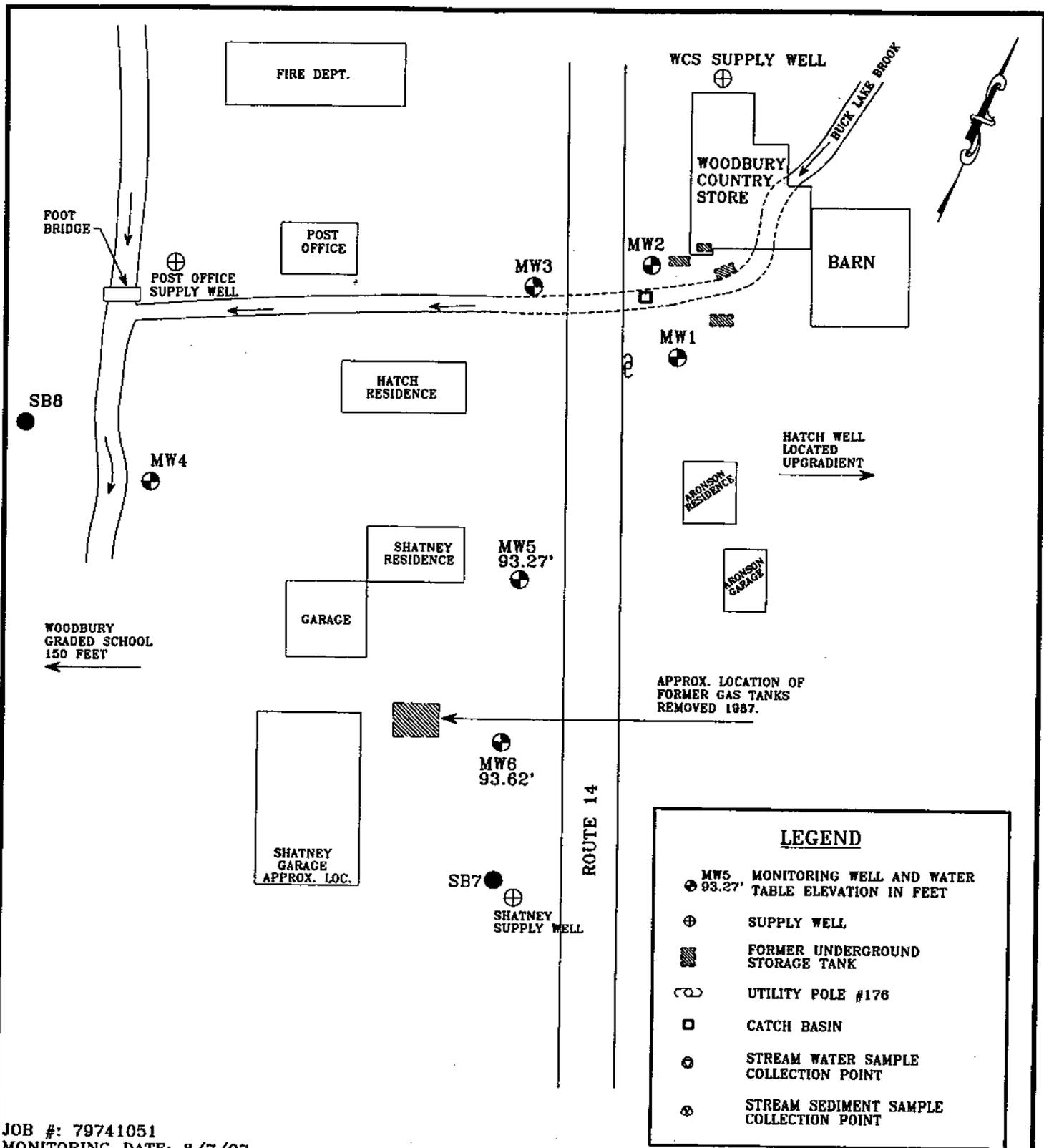


JOB #: 79741051
 REVISED 6/30/95: ADDED MW5, MW6, SB7 AND SB8 TO SITE MAP.



SHATNEYS GARAGE
 WOODBURY, VERMONT
SITE MAP

DATE: 9/24/97	DWG.#:2	SCALE: 1"=60'	DRN.:SB APP.:ES
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JOB #: 79741051
 MONITORING DATE: 8/7/97
 REVISED 8/30/95: ADDED MW5, MW6, SB7 AND SB8 TO SITE MAP.



SHATNEYS GARAGE

WOODBURY, VERMONT

GROUNDWATER ELEVATION MAP

DATE: 9/24/97 DWG.#:3 SCALE: 1"=60' DRN.:SB APP.:ES

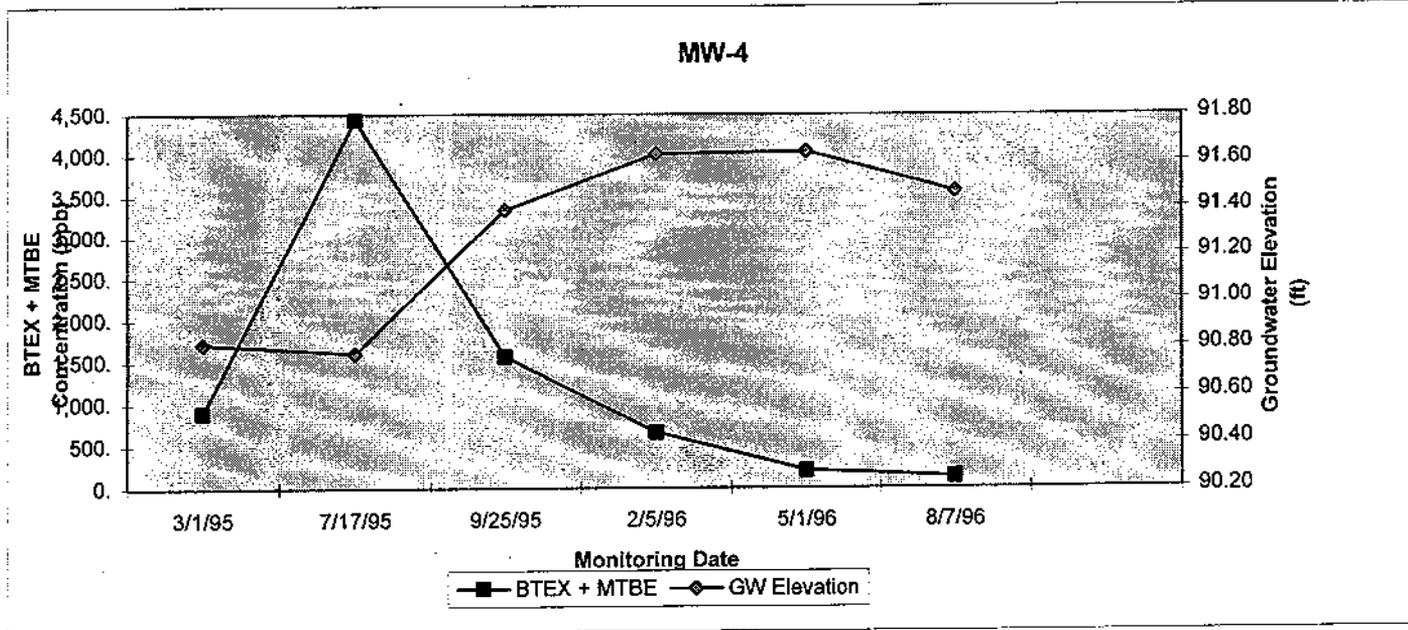
APPENDIX B

GROUNDWATER QUALITY SUMMARY DATA

Groundwater Quality Data Summary Shatney's Garage Woodbury, Vermont

Monitoring Well 4 (MW-4)

PARAMETER	Date of Sample Collection								
	3/1/95	7/17/95	9/25/95	2/5/96	5/1/96	8/7/96	8/7/97		
Benzene	178.	1,620.	760.	245.	66.	45.	No		
Chlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	Sample		
1,2-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	Collected		
1,3-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	This		
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	Date		
Ethylbenzene	313.	350.	170.	81.	26.	17.			
Toluene	14.	925.	24.	ND < 10	32.	ND < 2			
Xylenes	313.	1,360.	568.	290.	84.	65.			
Total Volatile Hydrocarbs.	6,790.	12,900.	5,380.	1,390.	680.	396.			
Total BTEX	818.	4,255.	1,522.	616.	208.	127.			
MTBE	81.	182.	44.	44.	ND < 20	ND < 2			
BTEX+MTBE	899.	4,437.	1,566.	660.	208.	127.			
Groundwater Elevation (ft)	90.81	90.77	91.39	91.63	91.64	91.47			



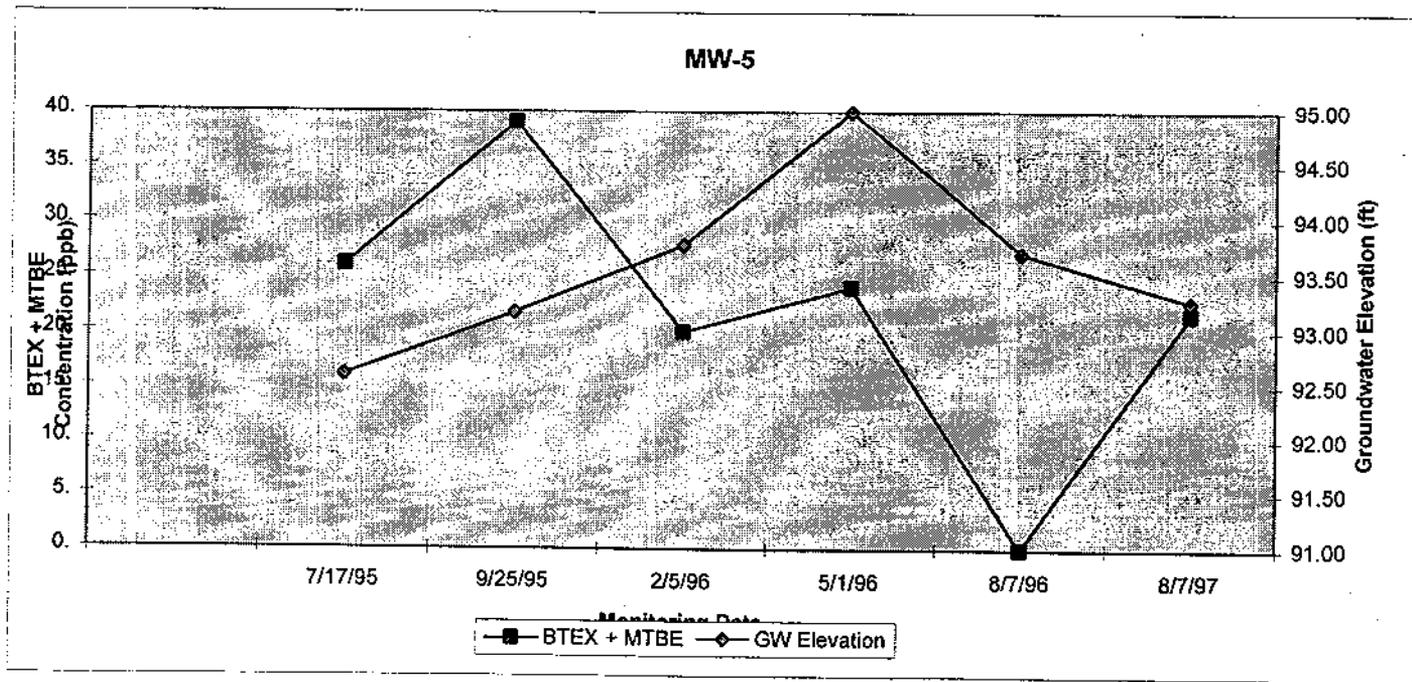
All values reported in ug/L (ppb)
 ND - Non Detect
 <10 Detection Limit

TBQ - Trace Below Quantitation Limit
 N/A - Not Applicable

Groundwater Quality Data Summary Shatney's Garage Woodbury, Vermont

Monitoring Well 5 (MW-5)

PARAMETER	Date of Sample Collection						
	7/17/95	9/25/95	2/5/96	5/1/96	8/7/96	8/7/97	
Benzene	ND < 1	ND < 1	ND < 1	4.	ND < 10	4.1	
Chlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 1	
1,2-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 1	
1,3-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 1	
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 1	
Ethylbenzene	ND < 1	ND < 1	6.	9.	ND < 10	4.3	
Toluene	5.	8.	8.	11.	ND < 10	6.0	
Xylenes	ND < 1	ND < 1	ND < 1	ND < 2	ND < 10	7.2	
Total Volatile Hydrocarbs.	ND < 1	761.	337.	634.	430.	N/A	
Total BTEX	5.	8.	14.	24.	ND	22.	
MTBE	21.	31.	6.	ND < 2	ND < 10	ND < 10	
BTEX+MTBE	26.	39.	20.	24.	ND	22.	
Groundwater Elevation (ft)	92.60	93.17	93.78	95.00	93.71	93.27	



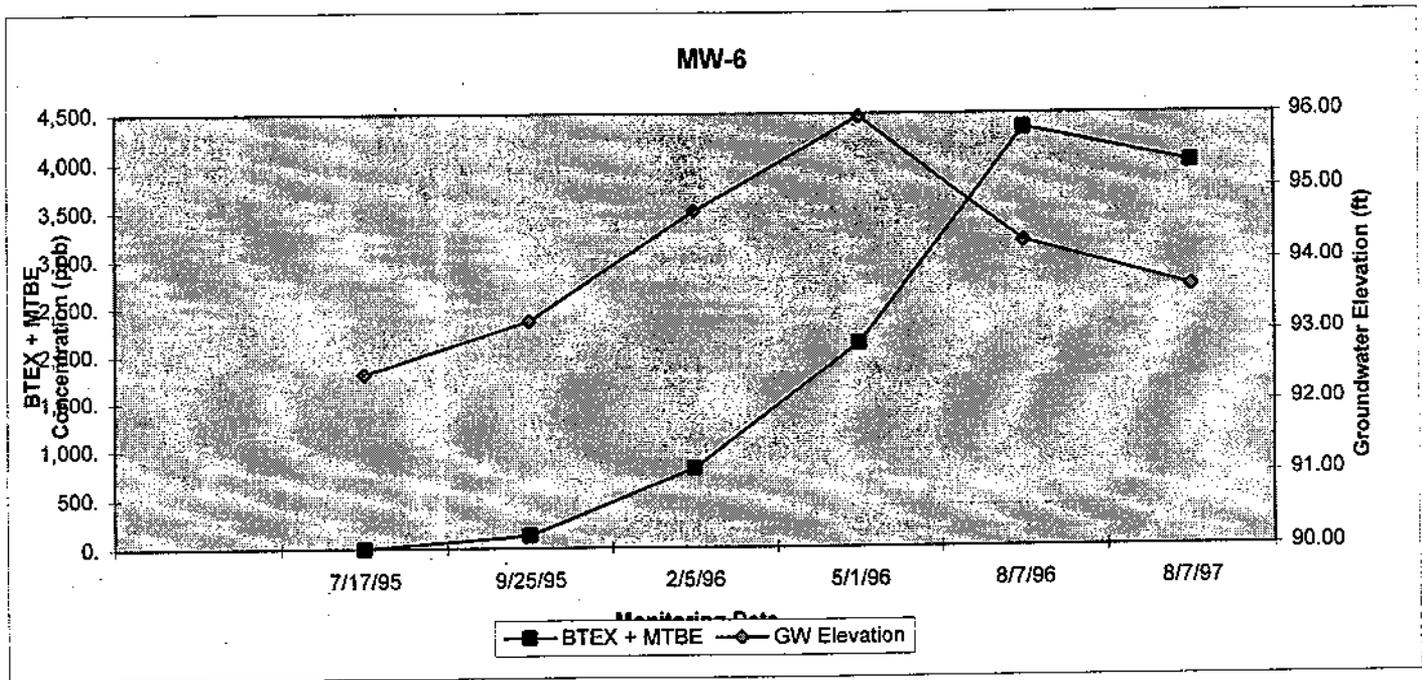
All values reported in ug/L (ppb)
 ND - Non Detect
 <10 Detection Limit

TBQ - Trace Below Quantitation Limit
 N/A - Not Applicable

Groundwater Quality Data Summary Shatney's Garage Woodbury, Vermont

Monitoring Well 6 (MW-6)

PARAMETER	Date of Sample Collection						
	7/17/95	9/25/95	2/5/96	5/1/96	8/7/96	8/7/97	
Benzene	2.0	30.	90.	222.	464.	375.	
Chlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 20	
1,2-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 20	
1,3-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 20	
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	ND < 20	
Ethylbenzene	1.0	34.	239.	368.	674.	634.	
Toluene	ND < 1	7.	29.	505.	1,110.	820.	
Xylenes	2.0	59.	446.	1,030.	2,100.	2,170.	
Total Volatile Hydrocarbs.	ND < 100	1,190.	2,800.	6,000.	7,540.	N/A	
Total BTEX	5.0	130.	804.	2,125.	4,348.	3,999.	
MTBE	ND < 1	ND < 1	ND < 1	ND < 5	ND < 20	ND < 200	
BTEX+MTBE	5.0	130.	804.	2,125.	4,348.	3,999.	
Groundwater Elevation (ft)	92.41	93.16	94.68	95.96	94.26	93.62	



All values reported in ug/L (ppb)
 ND - Non Detect
 <10 Detection Limit

TBQ - Trace Below Quantitation Limit
 N/A - Not Applicable

Groundwater Quality Data Summary
Shatney's Garage
Woodbury, Vermont

**Vermont Drinking Water Standards and
Quality Assurance and Control Samples**

Sample Date: August 7, 1997

PARAMETER	Equipment Blank	Trip Blank	Duplicate (MW-6)	Vermont Drinking Water Standards
Benzene	N/A	ND < 1	311.	5.0*
Chlorobenzene	N/A	ND < 1	ND < 20	100*
1,2-Dichlorobenzene	N/A	ND < 1	ND < 20	600*
1,3-Dichlorobenzene	N/A	ND < 1	ND < 20	600**
1,4-Dichlorobenzene	N/A	ND < 1	ND < 20	75*
Ethylbenzene	N/A	ND < 1	526.	700*
Toluene	N/A	ND < 1	672.	1,000*
Xylenes	N/A	ND < 1	1,790.	10,000*
Total Volatile Hydrocarbons	N/A	N/A	N/A	-
Total BTEX	N/A	ND	3,299.	-
MTBE	N/A	ND < 10	ND < 200	40**
BTEX + MTBE	N/A	ND	3,299.	-

* - EPA Established Maximum Contaminant Level

** - Vermont Health Advisory Level

All values reported in ug/L (ppb)
ND - Non Detect
<10 Detection Limit

TBQ - Trace Below Quantitation Limit

APPENDIX C

WATER SUPPLY QUALITY DATA SUMMARY

Supply Well Water Quality Data Summary
Shatney's Garage
Woodbury, Vermont

Shatney's Garage

PARAMETER	Date of Sample Collection										
	8/30/94	3/1/95	7/17/95	9/25/95	11/16/95	12/13/95	1/15/96	2/5/96	3/6/96	4/1/96	5/1/96
Benzene	<1.0	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
Chlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,2-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,3-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
Toluene	<1.0	ND<5	3.0	ND<1	ND<1	ND<1	ND<1	ND<1	13.0	ND<1	ND<1
Xylenes	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	2.0	ND<1	ND<1
Total Volatile Hydrocarbs.	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100
Total BTEX	ND	ND	3.0	ND	ND	ND	ND	ND	15.0	ND	ND
MTBE	2.5	<5.0	3.0	3.0	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1
BTEX+MTBE	2.5	ND	6.0	3.0	ND	ND	ND	ND	15.0	ND	ND

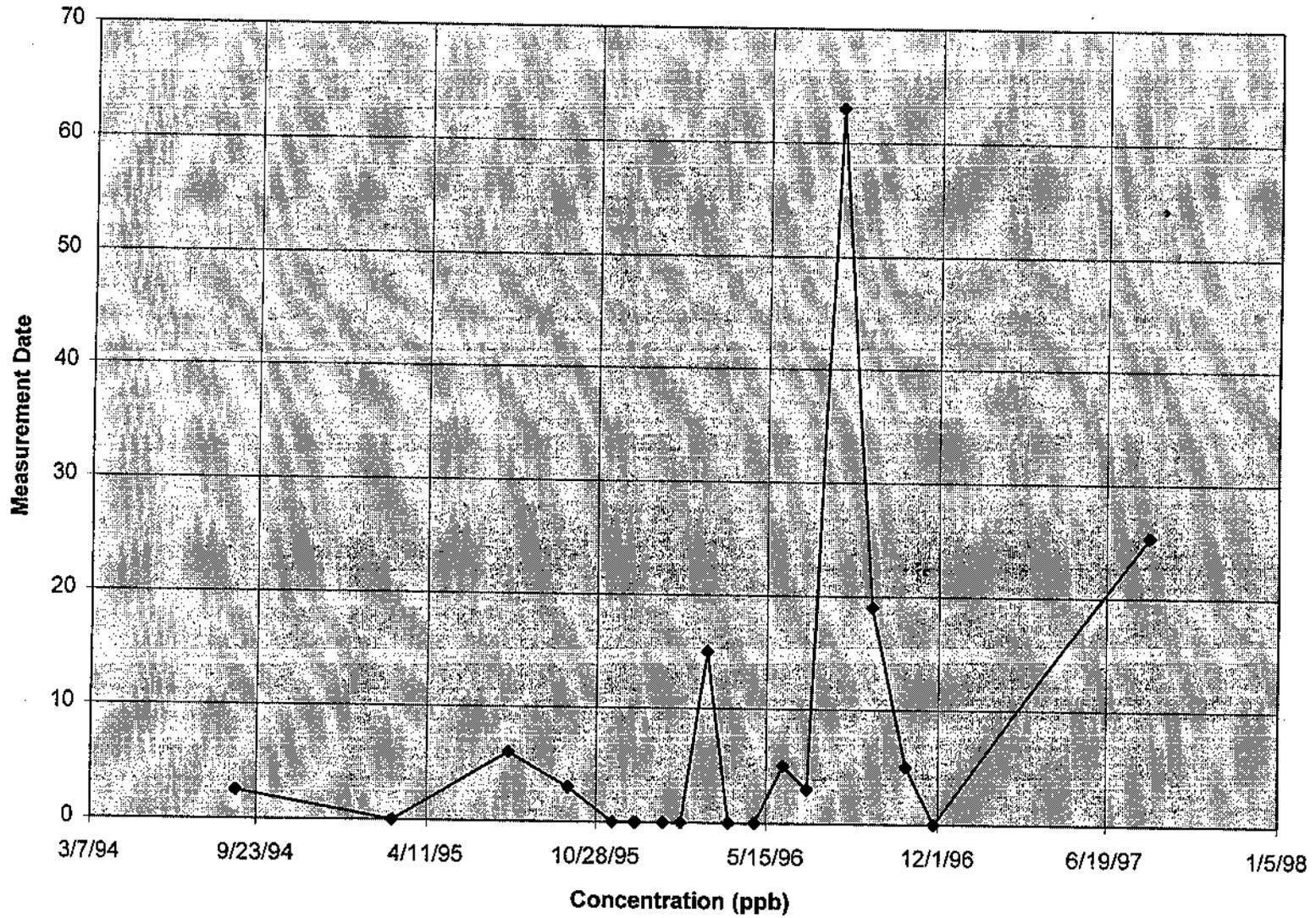
Shatney's Garage

PARAMETER	Date of Sample Collection								
	6/3/96	7/1/96	8/7/96	9/13/96	10/23/96	11/26/96	8/7/97		
Benzene	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		
Chlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	ND<1		
1,2-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	ND<1		
1,3-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	ND<1		
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	ND<1		
Ethylbenzene	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		
Toluene	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		
Xylenes	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		
Total Volatile Hydrocarbs.	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	N/A		
Total BTEX	ND	ND	ND	ND	ND	ND	ND		
MTBE	5.	3.	63.	19.	5.	ND<1	25.3		
BTEX+MTBE	5.	3.	63.	19.	5.	ND	25.3		

All values reported in ug/L (ppb)
 ND - Non Detect

TBQ - Trace Below Quantitation Limit

BTEX + MTBE Concentration Measured in Shatneys Garage Supply Well



APPENDIX D

GROUNDWATER LIQUID LEVEL DATA

9/23/97

**Liquid Level Monitoring Data
Shatney's Garage
Woodbury, Vermont**

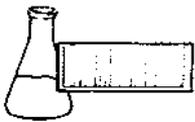
**Monitoring Date:
7-Aug-97**

Well I.D.	Well Depth	Top of Casing Elevation	Depth to Product	Depth to Water	Product Thickness	Specific Gravity of Product	Hydro Equivalent	Corrected Depth to Water	Corrected Water Table Elevation
MW-4	10.5	94.45	-	-	-	-	-	-	-
MW-5	15.0	99.04	-	5.77	-	-	-	5.77	93.27
MW-6	14.0	99.85	-	6.23	-	-	-	6.23	93.62

All values reported in feet

APPENDIX E

LABORATORY ANALYSIS REPORTS



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: Shatneys Garage
REPORT DATE: August 12, 1997
DATE SAMPLED: August 7, 1997

PROJECT CODE: GISH1780
REF.#: 107,790 - 107,794

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.

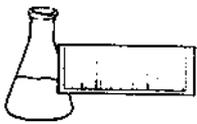
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

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



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

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International

DATE RECEIVED: August 8, 1997

PROJECT NAME: Shatneys Garage

REPORT DATE: August 12, 1997

CLIENT PROJ. #: 79741051

PROJECT CODE: GISH1780

Ref. #:	107,790	107,791	107,792	107,793	107,794
Site:	Trip Blank	MW5	MW6	Duplicate MW6	Shatney SW
Date Sampled:	8/7/97	8/7/97	8/7/97	8/7/97	8/7/97
Time Sampled:	8:10	12:27	12:45	12:45	1:00
Sampler:	R. Higgins	R. Higgins	R. Higgins	R. Higgins	R. Higgins
Date Analyzed:	8/12/97	8/12/97	8/12/97	8/12/97	8/12/97
UIP Count:	0	>10	>10	>10	0
Dil. Factor (%):	100	100	5	5	100
Surr % Rec. (%):	88	92	92	92	88
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
Benzene	<1	4.1	375.	311.	<1
Chlorobenzene	<1	<1	<20	<20	<1
1,2-Dichlorobenzene	<1	<1	<20	<20	<1
1,3-Dichlorobenzene	<1	<1	<20	<20	<1
1,4-Dichlorobenzene	<1	<1	<20	<20	<1
Ethylbenzene	<1	4.3	634.	526.	<1
Toluene	<1	6.	820.	672.	<1
Xylenes	<1	7.2	2,170.	1,790.	<1
MTBE	<10	<10	<200	<200	25.3

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated



ENDYNE, INC.

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

79741051

CHAIN-OF-CUSTODY RECORD

23239

Project Name: <u>Sharnley's Garage</u> Site Location: <u>Woodbury</u>	Reporting Address: <u>GRIFFIN</u>	Billing Address:
Endyne Project Number: <u>GZSH1780</u>	Company: Contact Name/Phone #: <u>E. Sandblom</u>	Sampler Name: <u>R. Higgins</u> Phone #:

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				
107,790	TRIP BLANK	H ₂ O	✓		8/8/97 12:30:10	2	40ml		602	HCl	
107,791	MWS				12:27						
107,792	MWB				12:45						
107,793	Duplicate MWL				12:45						
107,794	SHARNLEY SW House				1:00						
	SHARNLEY SUPERSTREET				1:05						

Relinquished by: Signature <u>[Signature]</u>	Received by: Signature <u>[Signature]</u>	Date/Time
Relinquished by: Signature <u>[Signature]</u>	Received by: Signature <u>Tami M. Chamberlain</u>	Date/Time <u>8-8-97</u>

New York State Project: Yes No 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 ₅	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):										