GRIFFIN INTERNATIONAL INC.

October 5, 1999

Ms. Lynda Provencher
Vermont ANR/DEC
Waste Management Division
103 South Main Street / West Building
Waterbury, VT 05671-0404

RE: Initial Site Investigation for Brandon Exxon (formerly Brandon Gulf)
Routes 7 & 73, Brandon, VT
VTDEC Site No. 89-0454

Dear Ms. Provencher:

Please find a copy of the Initial Site Investigation report for the Brandon Exxon station located at Routes 7 & 73 in Brandon, Vermont. This report has been forwarded to the Vermont Department of Environmental Conservation (VTDEC) on behalf of Wesco, Inc., the owner of the subject property.

Please contact me if you have any questions.

Sincerely,

Trina L. Cysz

Trina L. Cysz
Environmental Scientist

Enclosure

cc: Wesco, Inc.
GI#49941510

P.O. Box 943 • Williston, VT 05495 • Phone 802-865-4288 • Fax 802-657 4129
59 Clinton Street • Plattsburgh, NY 12901 • Phone 518-562-4666 • Fax 518 561 6832

INITIAL SITE INVESTIGATION OF SUBSURFACE PETROLEUM CONTAMINATION AT BRANDON EXXON

OCTOBER 5, 1999

Site Location:

Brandon Exxon
(formerly Brandon Gulf)
Routes 7 and 73
Brandon, VT

VTDEC SITE #89-0454
GI Project #49941510

Prepared For:

Wesco Inc.
32 San Remo Drive
South Burlington, VT 05403

Prepared By:

P.O. Box 943 / 20 Commerce Street Williston, VT 05495 (802) 865-4288

Table of Contents

I. INTRODUCTION

This report summarizes the initial investigation of subsurface petroleum contamination at the Brandon Exxon (formerly Brandon Gulf) facility located at the intersection of Routes 7 and 73 in Brandon, VT (see location map in Appendix A). This investigation was conducted by Griffin International, Inc. (Griffin) for Wesco, Inc. (Wesco). Investigative efforts at the site were conducted due to the detection of subsurface petroleum impacts during the removal of a 500-gallon fuel oil underground storage tank (UST) on April 21, 1999. This investigation was conducted to define the extent and degree of residual petroleum contamination remaining in the subsurface at the site. The investigation consisted of the following tasks:

1. The installation of four groundwater monitoring wells.
2. Groundwater sample collection from the monitoring wells to characterize the degree of groundwater contamination in the former source area.
3. A survey of potential sensitive receptors in the vicinity of Brandon Exxon.
4. Preparation of a summary report (this document).

The Vermont Department of Environmental Conservation (VTDEC) requested that this work be completed in a letter to Mr. William Simendinger from Mr. Chuck Schwer of the VTDEC, dated May 25, 1999. All work at the site was conducted in accordance with the June 11, 1999 Work Plan and Cost Estimate prepared by Griffin. Approval to proceed with this plan was given in a letter dated June 21, 1999 from Ms. Lynda Provencher of the VTDEC to Mr. Simendinger.

II. BACKGROUND

A. Background Information

On April 21, 1999 Griffin inspected the removal and permanent closure of one 500-gallon fuel oil UST, which was previously utilized for on-premises heating. The UST was observed to be in average condition with minor rust and pitting. This UST was inferred to have been installed circa 1979.

Volatile organic compound (VOC) concentrations, measured with an HNu™ photoionization detector (PID) equipped with a 10.2 eV bulb, ranged from 0 parts per million (ppm) to 140 ppm. The highest PID reading was measured at a depth of approximately 4.5 feet below surface grade (bsg) at the water table. A petroleum sheen was observed on the groundwater in the UST excavation pit. Soils at this depth were observed to be dark gray/black in color and exhibited an odor characteristic of fuel oil. Excavated soils were backfilled into the UST pit. Further information regarding the UST can be found in Griffin's April 26, 1999 *Piping Replacement Inspection Report.*

B. Site Description

The subject property is located on Route 7 in Brandon, Vermont, near the intersection of Route 73 (Conant Square). The site is approximately 0.53+/- acre in size and is located within a commercial/residentially-zoned portion of town (Map 22, Block 50, Lot 50). The subject site consists of a one-story convenience store building set on a concrete slab foundation. The remainder of the site is occupied by a gasoline pump island, and paved driveway and parking areas. There are currently four USTs on-site: three 6,000-gallon gasoline USTs and one 8,000-gallon gasoline UST. These USTs had reportedly been installed in 1987, are constructed of single-walled steel, and contain cathodic protection.

Topography on-site is generally flat. Based upon a review of the Brandon, VT USGS topographic map (1946) and field observations, groundwater beneath the site is inferred to flow to the southwest towards Otter Creek and associated wetlands areas located approximately 2,600-5,000 feet southwest of the site. The subject site is located at approximately 425 feet above sea level and is situated at approximately 43°48'01" North Latitude and 73°05'35" East Longitude (Universal Transverse Mercator coordinates $^{48}51^{300m}$ N and $^{6}53^{200m}$ E).

The subject site is abutted to the north by Brandon Lumber and Cole's Electric. To the east and south, the site is abutted by residential properties. To the west, the site is abutted by Route 7, across which is Route 73, residential properties, and the Brandon Baptist Church.

The subject site is serviced by municipal water and sewer, electricity, and fuel oil heat. Fuel oil is stored in a 275-gallon aboveground storage tank (AST) located near the rear of the site building.

C. Site Geology

According to the Surficial Geologic Map of Vermont (Doll, 1970) surficial materials at the subject site are mapped as glacial till. According to the Bedrock Geological Map of Vermont (Doll, 1961), the subject property is underlain by the Cambrian-aged Winooski Dolomite and the Danby and Potsdam Formations. The Winooski Dolomite is characterized by buff-weathered, pink buff and gray dolomite. The Danby and Potsdam Formations are characterized as consisting of interbedded quartzite and dolomite.

III. INVESTIGATIVE PROCEDURES

A. Monitoring Well Installation

On July 13, 1999 Griffin performed a site visit in order to determine if the four on-site monitoring wells would serve as viable monitoring points at the subject site. The existing wells were not found to be viable due to bends in the well screens and blockage with sand/silt.

On July 19, 1999, four monitoring wells were installed by Environmental Drilling of Glens Falls, New York using a hollow stem auger rig. Drilling and well construction were directly supervised by a Griffin engineer. Soil samples were collected at intervals of every five feet. Soil samples were screened for VOCs using an Hnu™ Model PI-101 PID equipped with a 10.2 eV bulb. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards. Contaminant concentrations and soil characteristics were recorded in detailed boring logs by the supervising Griffin engineer (see Well Logs, Appendix B). Soil samples were not submitted for laboratory analysis.

Monitoring wells MW-1 and MW-2 were installed in an inferred downgradient position of the former fuel oil UST and the four existing USTs. Monitoring well MW-3 was installed in the approximate vicinity of the former fuel oil UST. Monitoring well MW-4 was installed in an inferred upgradient position of the USTs.

MW-1
Subsurface conditions encountered in this boring consisted of poorly graded sand with silt at a depth of 5'-7' bsg, underlain by lean clay with sand at a depth of 10'-12' bsg. Sandy elastic silt was encountered at a depth of 15'-17' bsg at the terminus of the boring. Refusal on bedrock was not encountered in this boring. Groundwater was measured at approximately 8 feet bsg on the day of drilling. VOCs were detected in the 10'-12' bsg interval at a concentration of 155 ppm.

MW-2
Subsurface conditions encountered in this boring consisted of well-graded sand with silt and gravel at a depth of 5'-7' bsg, underlain by lean clays at a depth of 10'-12' bsg and 15'-17' bsg. Refusal on bedrock was not encountered in this boring. Groundwater was measured at approximately 9 feet bsg on the day of drilling. VOCs were detected in the three sampling intervals, with the highest reading (120 ppm) being detected near the soil/water interface.

MW-3
Subsurface conditions encountered in this boring consisted of poorly graded sand with silt at a depth of 5'-7' bsg, underlain by lean clay with sand at a depth of 10'-12' bsg. Silty sand was

encountered at a depth of 15'-17' bsg at the terminus of the boring. Refusal on bedrock was not encountered. Groundwater was measured at approximately 7 feet bsg on the day of drilling. VOCs were detected in the three sampling intervals, with the highest reading (14 ppm) being detected near the soil/water interface.

MW-4
Subsurface conditions encountered in this boring consisted of well-graded sand with silt and gravel at a depth of 5'-7' bsg, underlain by lean clay at a depth of 10'-12' bsg and 15'-17' bsg. The boring was advanced to a depth of 17 feet bsg. Refusal on bedrock was not encountered in this boring. Groundwater was measured at approximately 10 feet bsg on the day of drilling. VOCs were not detected with a PID in this boring.

Each monitoring well was constructed with a ten-foot length of 0.010-inch, factory slotted, 2-inch diameter, PVC screen installed with its midpoint at the approximate groundwater elevation. The wells were completed to one-half foot below the ground surface with Schedule 40, 2-inch diameter, PVC, flush-threaded riser. A silica sand pack was placed in the annulus of the well between the borehole wall and the screen to a level approximately one foot above the top of the screened interval. A bentonite seal was placed above the sand pack to isolate the screened interval and prevent migration of surface runoff water into the well. The wells were completed to the ground surface with a flush-mounted road box set in concrete. Well construction details can be found in Appendix B.

B. Determination of Groundwater Elevations, Flow Direction, and Gradient

The newly installed monitoring well locations and elevations were surveyed on July 30, 1999 for inclusion on the Site Map (Appendix A). The top of PVC casing in MW-4 was assigned an arbitrary elevation of 100.00 feet. Measured depths to water ranged from approximately 6.72 feet below top of casing (btoc) to 10.09 feet btoc. Liquid level measurement data can be found in Appendix C. Free-phase petroleum product was not observed on groundwater during this monitoring event.

Based on groundwater level measurements, groundwater at the site was determined to flow to the southwest, consistent with field observations and topographic map review. The hydraulic gradient was measured to be approximately 8.7%. A Groundwater Contour Map can be found in Appendix A.

C. Groundwater Sample Collection and Analysis

On July 30, 1999 groundwater samples were collected from the newly installed monitoring wells and submitted to Endyne, Inc. of Williston, Vermont. The samples were collected according to

Griffin's groundwater sampling protocol, which complies with industry and state standards. The samples were analyzed for VOCs by EPA Method 8021B and for Total Petroleum Hydrocarbons (TPH) by EPA Method 8015 DRO (Diesel Range Organics). In accordance with VTDEC protocols and for quality assurance/quality control (QA/QC), one duplicate sample (MW-4) and one trip blank were also collected and analyzed for VOCs by EPA Method 8021B.

Methyl tertiary butyl ether (MTBE) was detected in groundwater from monitoring well MW-1 at a concentration above its applicable Vermont Groundwater Enforcement Standard (VGES). MTBE was not detected in the groundwater samples from monitoring wells MW-2, MW-3, and MW-4.

Ethylbenzene, 1,3,5-Trimethylbenzene (TMB), 1,2,4-TMB, and naphthalene were reported as detected above their applicable VGESs in groundwater from monitoring wells MW-2 and MW-3. In addition, benzene was detected in groundwater from monitoring well MW-2 above its VGES. VOCs were not detected above laboratory detection limits in groundwater from monitoring well MW-4. Groundwater data can be found in Appendix D, and laboratory results can be found in Appendix E.

TPH were not detected above laboratory detection limits in groundwater from monitoring well MW-1 and MW-4. TPH were detected in groundwater from monitoring well MW-2 at a concentration of 10.8 milligrams per liter (mg/L), and in groundwater from MW-3 at a concentration of 26.2 mg/L. There is currently no VGES for TPH.

Results from the analyses of the trip blank and duplicate samples indicate that adequate QA/QC measures were maintained during sample collection and analysis.

IV. EVALUATION OF POTENTIALLY SENSITIVE RECEPTORS

A visual survey of the area surrounding the Brandon Exxon property was conducted in July 1999, in conjunction with the monitoring well installation activities. Based on these observations, an estimation of the potential risk to identified receptors was made based on proximity to the source area, groundwater flow direction, and contaminant concentration levels in subsurface soils and groundwater.

Water Supplies

The subject site and surrounding properties are serviced by municipal water. According to the Town of Brandon Planning Department, municipal water for Brandon is supplied by the Brandon Fire District, which maintains three wells in the Village of Forest Dale, located approximately 2.5 miles east of the site.

Buildings in the Vicinity

The site building is situated on a concrete slab foundation. The easterly and southerly abutting residences do contain below-grade basements. Access was not available to these buildings to perform air screening in the basements on the day of drilling (i.e. tenants were not home to provide access). However, based on the relatively low source area strength and cross- to upgradient positions, these residences are anticipated to be at a low risk from the accumulation of petroleum vapors in the basements.

Surface Water

The nearest surface water body in an apparent hydraulically downgradient direction from the site is Otter Creek and its associated wetland areas located approximately 2,600-5,000 feet west-southwest of the site. No wetlands or drainage ditches were observed on-site. Based on distance from the site and the relatively low source area strength, Otter Creek and its associated wetland areas are anticipated to be at a low risk from petroleum contamination migrating from the site.

Utility Corridors

Groundwater at the site is located at approximately six to ten feet below grade, below the general approximate depth of utility lines. Thus, the potential risk of dissolved phase contamination migration along utility corridors is considered minimal. Given the absence of free phase product and the low levels of dissolved petroleum contamination in the former source area, the potential for significant vapor migration along utility corridors is considered to be negligible.

V. CONCLUSIONS

Based on the activities performed at the Brandon Exxon facility, the following conclusions are offered:

1. One 500-gallon fuel oil UST was removed from the site in April 1999. VOC concentrations, as measured with a PID, ranged from 0 ppm to 140 ppm. The highest PID reading was measured at a depth of approximately 4.5 feet bsg at the water table. Soils at this depth were observed to be dark gray/black in color and exhibited an odor characteristic of fuel oil. Excavated soils were backfilled into the UST pit. Four groundwater monitoring wells were installed at the subject site in July 1999 in order to further characterize the degree and extent of residual petroleum impacts at the site.

2. Neither VOCs nor TPH were detected above laboratory detection limits in groundwater from monitoring well MW-4, the furthest upgradient well. Petroleum constituents exceeding their applicable VGESs were detected in groundwater from monitoring wells MW-1, MW-2, and MW-3.

3. TPH were detected above laboratory detection limits in groundwater from monitoring wells MW-2 and MW-3. There is currently no VGES for TPH. Free product was not observed by Griffin on the date of groundwater sampling. Groundwater beneath the subject site was measured to flow to the southwest, at an approximate gradient of 8.7%.

4. Based on field observations and analytical results, residual petroleum impacts are present to a limited extent in soil and groundwater beneath the site. To date, Griffin is not aware of reported impacts to adjacent building basements. There are currently no other known receptors affected by subsurface petroleum contamination from the Brandon Exxon site.

5. With the apparent source removed (i.e., the former fuel oil UST), and barring the identification of an additional source, it is expected that, over time, the natural processes of dilution, dispersion, and biodegradation will reduce dissolved contaminant concentrations present in groundwater, and adsorbed contamination in soils at the Brandon Exxon site.

VI. RECOMMENDATIONS

Griffin recommends semi-annual groundwater monitoring activities at the site. The next groundwater sampling round is recommended to take place in late January 2000.

VII. REFERENCES

Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, Vermont Geological Survey.

Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, Vermont Geological Survey.

Town of Brandon Planning Department, August 27, 1999, water supply information, 802.247.0227

Town of Brandon Assessors' Office, September 2, 1999, assessors' map, property information.

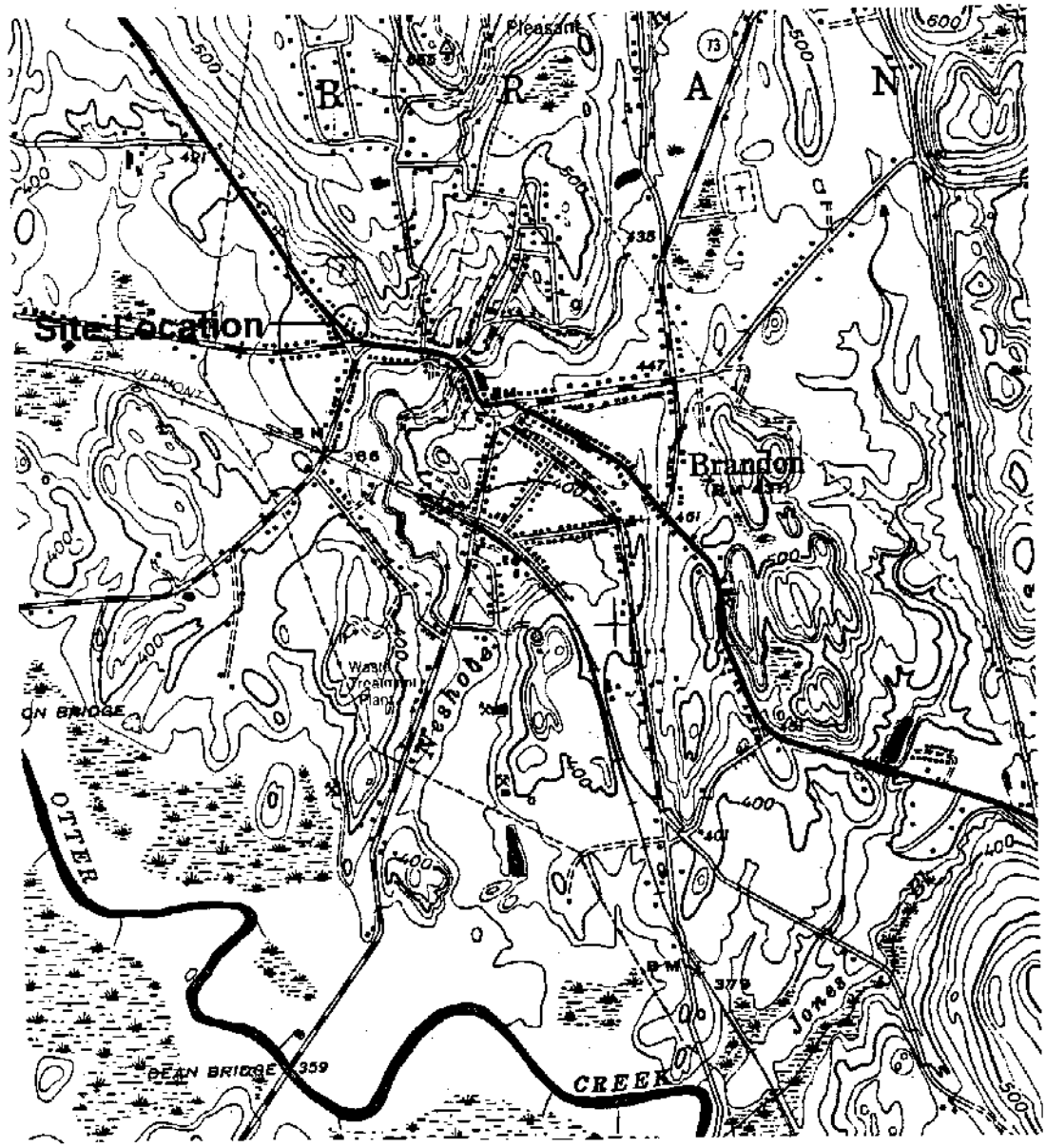
USGS Topographic Map, Brandon, VT, 1946.

Semi-annual

APPENDIX A

MAPS

SITE LOCATION MAP
SITE MAP
GROUNDWATER CONTOUR MAP
CONTAMINANT CONCENTRATION MAP



Griffin Job Number: *49941510*

Source: *USGS Topographic Map, Brandon, VT, 1946*

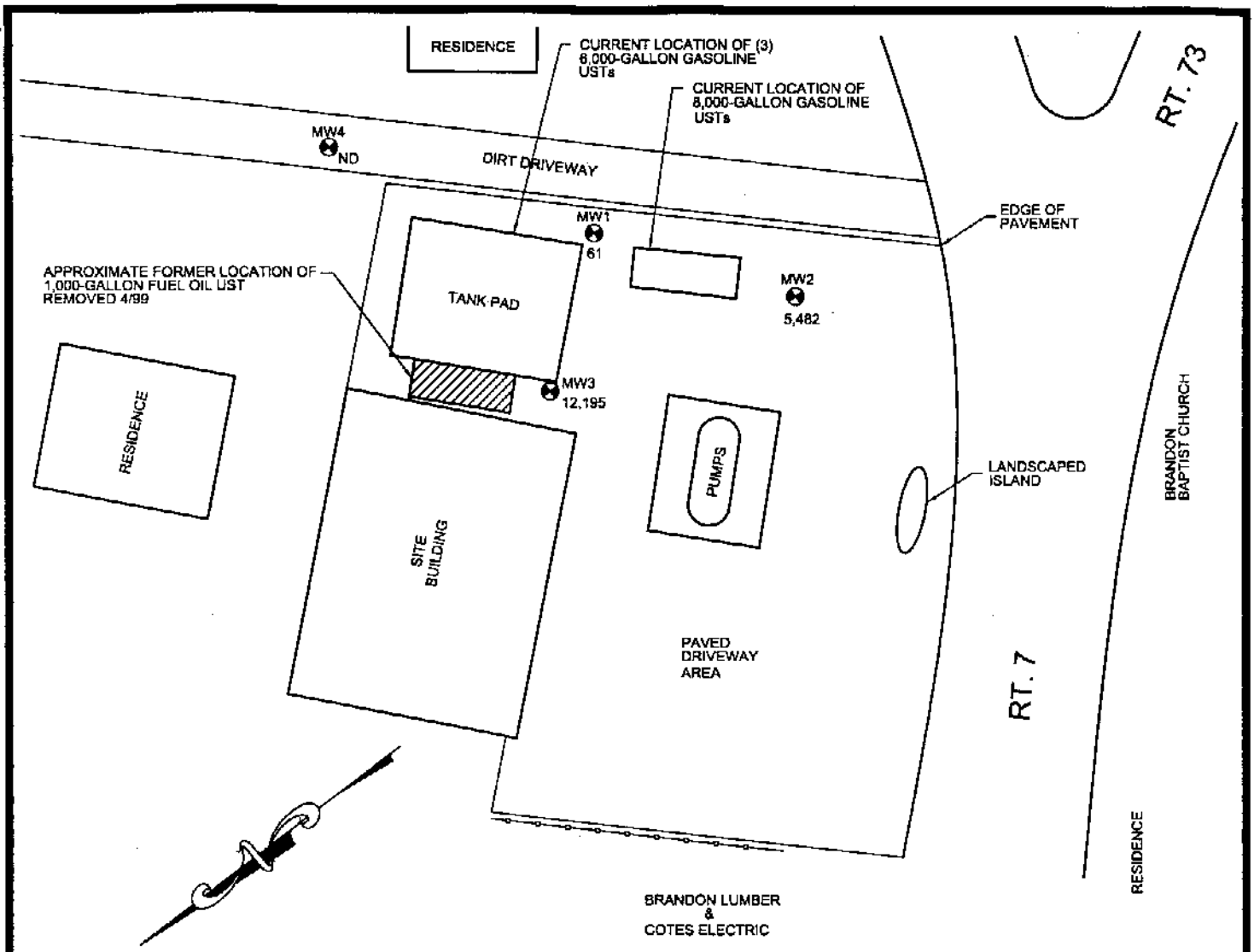
GRIFFIN INTERNATIONAL

Brandon Exxon

Routes 7 & 73, Brandon VT

Site Location Map
VTDEC Site No. 89-0454

Date: 09/08/99	Drawing No. 1/1	Scale: 1:25,000	By: TLC



LEGEND

MW2 MONITORING WELL

— o — FENCE

FORMER LOCATION OF UST

CURRENT LOCATION OF UST

SOURCE:GRIFFIN SITE SURVEY 7/30/99

JOB #:49941510 VTDEC SITE # 89-0454

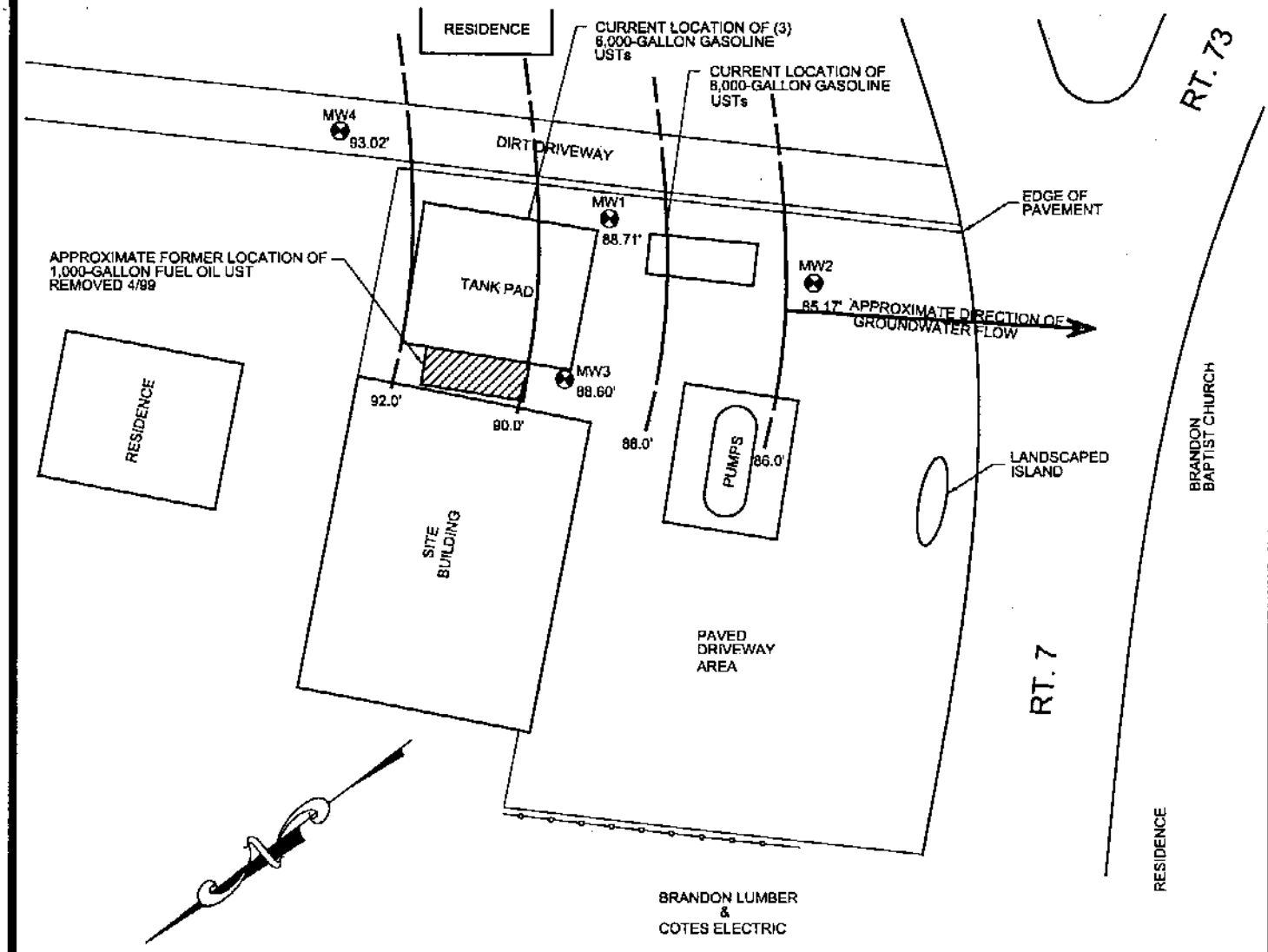
GRIFFIN INTERNATIONAL INC

BRANDON EXXON

RT. 7 & 73 BRANDON, VERMONT

SITE MAP

DATE: 9-22-99	DWG.#: 1	SCALE:1"=30'	DRN.:JL	APP.:TC



LEGEND

85.17 MW2 — MONITORING WELL WITH GROUNDWATER LEVEL ELEVATION

— o — FENCE

90.0' — GROUNDWATER TABLE CONTOUR

FORMER LOCATION OF UST

CURRENT LOCATION OF UST

JOB #:49941510

GRIFFIN INTERNATIONAL INC

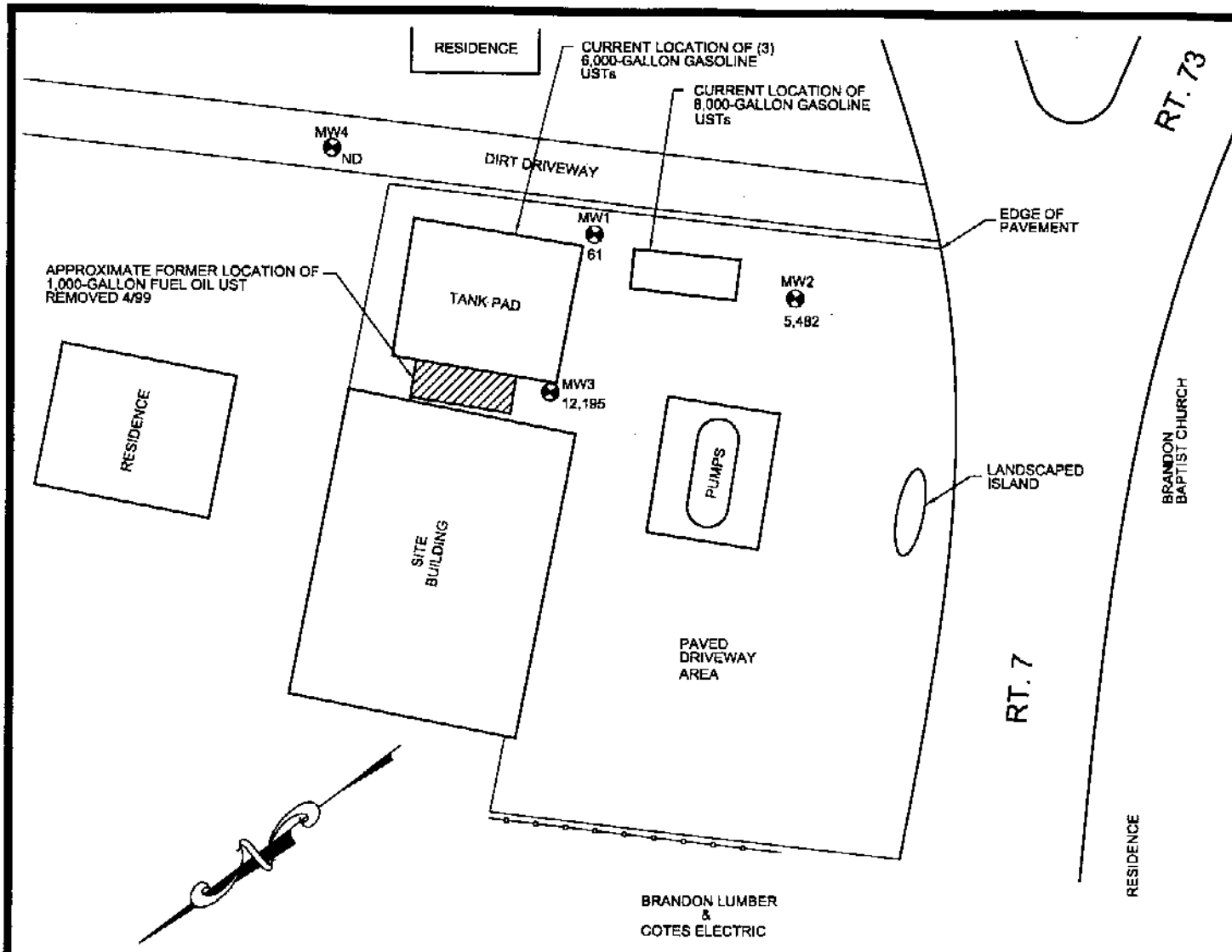
BRANDON EXXON

RT. 7 & 73 BRANDON, VERMONT

GROUNDWATER CONTOUR MAP

MEASURED: 7/30/99

DATE: 9-23-99	DWG.#: 2	SCALE:1"=30'	DRN.:JL	APP.:TC



LEGEND

MW2 5,482 MONITORING WELL VOC CONCENTRATION (ppb)

— o — FENCE

FORMER LOCATION OF UST

CURRENT LOCATION OF UST

JOB #:49941510

GRIFFIN INTERNATIONAL INC

BRANDON EXXON

RT. 7 & 73 BRANDON, VERMONT

CONTAMINANT CONCENTRATION MAP

TOTAL TARGETED VOCs

MEASURED 7/30/99

DATE: 9-23-99	DWG.#: 3	SCALE:1"=30'	DRN.:JL	APP.:TC

APPENDIX B

WELL LOGS

PROJECT BRANDON EXXON

LOCATION BRANDON, VERMONT

DATE DRILLED 7/19/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 4.25"

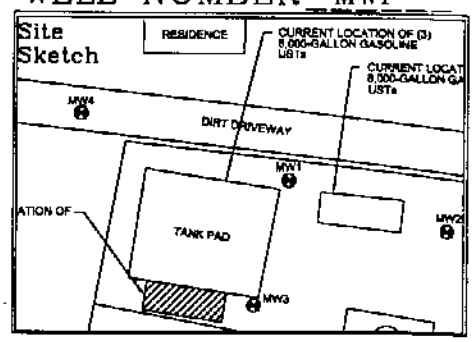
SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

CASING DIA. 2" LENGTH 4.5' TYPE sch 40 pvc

DRILLING CO. ENV. DRILLING DRILLING METHOD HSA

DRILLER DUANE LOG BY WJD

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
0–25		ROAD BOX; LOCKING WELL CAP; CONCRETE; NATIVE BACKFILL; BENTONITE; WELL RISER; SAND PACK; WELL SCREEN; BOTTOM CAP; UNDISTURBED NATIVE SOIL	5'–7'– 6,4,6,7 0 ppm 10'–12'– 6,4,3,2 0 ppm 15'–17'– 1,2,6,6 155 ppm	POORLY GRADED SAND W/SILT (SP–SM) 10% silt; 80% medium to coarse sand; 10% fine gravel, poorly graded, dry, orange–brown 8' WATER TABLE LEAN CLAY W/SAND (CL) 75% silt; 15% fine sand; 10% fine to coarse gravel, well to poorly graded, dry to moist, light gray/brown SANDY ELASTIC SILT (MH) 90% silt; 10% fine sand; well graded, wet, light gray/brown. Gray–black staining observed in silt layer on top 2" of split spoon. BASE OF WELL AT 15' END OF EXPLORATION AT 17'	0–25

PROJECT BRANDON EXXON

LOCATION BRANDON, VERMONT

DATE DRILLED 7/19/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 4.25"

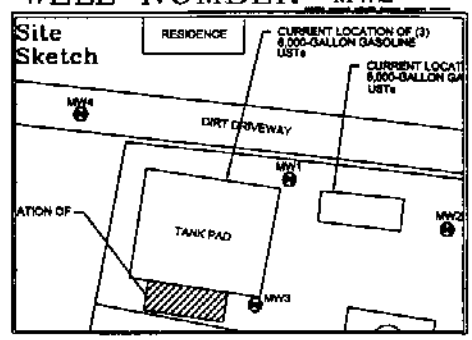
SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

CASING DIA. 2" LENGTH 4.5' TYPE sch 40 pvc

DRILLING CO. ENV. DRILLING DRILLING METHOD HSA

DRILLER DUANE LOG BY WJD

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 CONCRETE			0
1		NATIVE BACKFILL			1
2					2
3		BENTONITE			3
4					4
5		WELL RISER			5
6			5'-7'- 7,5,6,5 35 ppm	WELL GRADED SAND W/SILT & GRAVEL (SW-SM) 10% silt; 75% fine to coarse sand; 15% fine, subangular gravel, well graded, dry, light brown	6
7					7
8					8
9		SAND PACK		9' WATER TABLE ▼	9
10					10
11			10'-12'- 3,4,5,5 120 ppm	LEAN CLAY (CL) 90% silt; 10% fine sand, poorly graded, moist, olive gray. Lensed very fine sand observed throughout spoon.	11
12		WELL SCREEN			12
13					13
14		BOTTOM CAP			14
15					15
16			15'-17'- 4,5,4,6 28 ppm	LEAN CLAY W/SAND (CL) 80% silt; 10% fine sand; 10% fine to coarse, subangular gravel, well graded, wet, light gray/brown, mild petroleum odor	16
17		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 15' END OF EXPLORATION AT 17'	17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT BRANDON EXXON

LOCATION BRANDON, VERMONT

DATE DRILLED 7/19/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

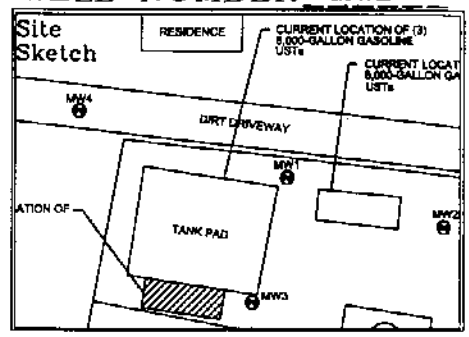
CASING DIA. 2" LENGTH 4.5' TYPE sch 40 pvc

DRILLING CO. ENV. DRILLING DRILLING METHOD HSA

DRILLER DUANE LOG BY WJD

WELL NUMBER MW3

Site Sketch



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
0–25	ROAD BOX; LOCKING WELL CAP; CONCRETE; NATIVE BACKFILL; BENTONITE; WELL RISER; SAND PACK; WELL SCREEN; BOTTOM CAP; UNDISTURBED NATIVE SOIL		5'–7'– 4,8,8,8 5.5 ppm	POORLY GRADED SAND W/SILT (SP–SM) 10% silt; 80% fine to coarse sand; 10% fine gravel, poorly graded, dry, orange–yellow 7' WATER TABLE	0–25
			10'–12'– 6,6,7,5 14 ppm	LEAN CLAY (CL) 90% silt; 10% fine sand, well to graded, moist, light gray/brown. Lensed fine sand at 1" to 3".	
			15'–17'– 4,6,6,100 1 ppm	SILTY SAND (SM) 30% silt; 70% fine sand; well graded, wet, light brown	
				BASE OF WELL AT 15' END OF EXPLORATION AT 17'	

PROJECT BRANDON EXXON

LOCATION BRANDON, VERMONT

DATE DRILLED 7/19/99 TOTAL DEPTH OF HOLE 17'

DIAMETER 4.25"

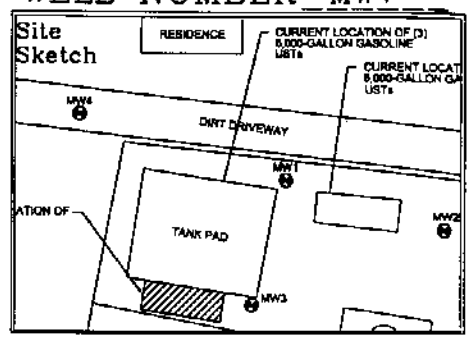
SCREEN DIA. 2" LENGTH 10' SLOT SIZE 0.010"

CASING DIA. 2" LENGTH 4.5' TYPE sch 40 pvc

DRILLING CO. ENV. DRILLING DRILLING METHOD HSA

DRILLER DUANE LOG BY WJD

WELL NUMBER MW4



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			0
1		LOCKING WELL CAP			1
2		CONCRETE			2
3		NATIVE BACKFILL			3
4		BENTONITE			4
5		WELL RISER			5
6			5'-7'- 4,6,6,7 0 ppm	WELL GRADED SAND W/SILT & GRAVEL (SW-SM) 10% silt; 75% fine to coarse sand; 15% fine gravel, well graded, dry to moist, yellow-orange	6
7					7
8					8
9		SAND PACK			9
10				10' WATER TABLE ▼	10
11			10'-12'- 2,2,2,2 0 ppm		11
12		WELL SCREEN		LEAN CLAY (CL) 90% silt; 10% fine sand, well graded, wet, dark gray	12
13					13
14					14
15		BOTTOM CAP			15
16			15'-17'- 1,2,3,3 0 ppm	LEAN CLAY (CL) 90% silt; 10% fine sand, well graded, wet, dark gray	16
17					17
18		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 15' END OF EXPLORATION AT 17'	18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

APPENDIX C

LIQUID LEVEL MONITORING DATA

Liquid Level Monitoring Data
Brandon Exxon, Routes 7 and 73
Brandon, VT
VTDEC Site No. 89-0454

Monitoring Date: 7/30/99

Well I.D.	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-1	**95.50**	-	**6.79**	-	-	-	**6.79**	**88.71**
MW-2	**95.26**	-	**10.09**	-	-	-	**10.09**	**85.17**
MW-3	**95.32**	-	**6.72**	-	-	-	**6.72**	**88.60**
MW-4	**100.00**	-	**6.98**	-	-	-	**6.98**	**93.02**

All Values Presented in Units of Feet

APPENDIX D

GROUNDWATER DATA SUMMARY

Groundwater Quality Summary
Brandon Exxon, Routes 7 and 73
Brandon, VT
VTDEC Site No. 89-0454

PARAMETER	MW-1				VGES
	7/30/99				
Benzene	TBQ <1				5
Toluene	ND <1				1,000
Ethylbenzene	ND <1				700
Xylenes	ND <1				10,000
Total BTEX	TBQ <1				-
MTBE	**61.0**				40
1,3,5 Trimethylbenzene	TBQ <1				4
1,2,4 Trimethylbenzene	TBQ <1				5
Naphthalene	ND <1				20
Total Targeted VOCs	**61.**				-

PARAMETER	MW-2				VGES
	7/30/99				
Benzene	**25.0**				5
Toluene	**285.**				1,000
Ethylbenzene	**742.**				700
Xylenes	**2,900.**				10,000
Total BTEX	**3,952.**				-
MTBE	ND <200				40
1,3,5 Trimethylbenzene	**307.**				4
1,2,4 Trimethylbenzene	**1030.**				5
Naphthalene	**193.**				20
Total Targeted VOCs	**5,482.**				-

all values in parts per billion (ppb)
TBQ <1 - trace below quantitation limit (quantitation limit)
VGES - Vermont Groundwater Enforcement Standard
ND <1 = not detected less than the detection limit.
Bold values indicate detection. Shaded values indicate detection at or exceeding the applicable VGES.
Laboratory analysis by EPA Method 8021B.

Groundwater Quality Summary
Brandon Exxon, Routes 7 and 73
Brandon, VT
VTDEC Site No. 89-0454

PARAMETER	MW-3				VGES
	7/30/99				
Benzene	**TBQ <50**				5
Toluene	**301.**				1,000
Ethylbenzene	**783.**				700
Xylenes	**6,070.**				10,000
Total BTEX	**7,154.**				-
MTBE	ND <500				40
1,3,5 Trimethylbenzene	**1100.**				4
1,2,4 Trimethylbenzene	**3510.**				5
Naphthalene	**431.**				20
Total Targeted VOCs	**12,195.**				-

PARAMETER	MW-4				VGES
	7/30/99				
Benzene	ND <1				5
Toluene	ND <1				1,000
Ethylbenzene	ND <1				700
Xylenes	ND <1				10,000
Total BTEX	ND				-
MTBE	ND <10				40
1,3,5 Trimethylbenzene	ND <1				4
1,2,4 Trimethylbenzene	ND <1				5
Naphthalene	ND <1				20
Total Targeted VOCs	ND				-

all values in parts per billion (ppb)
TBQ <1 - trace below quantitation limit (quantitation limit)
VGES - Vermont Groundwater Enforcement Standard
ND <1 = not detected less than the detection limit.
Bold values indicate detection. Shaded values indicate detection at or exceeding the applicable VGES.
Laboratory analysis by EPA Method 8021B.

APPENDIX E

LABORATORY ANALYTICAL REPORTS

ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Brandon Exxon/#49941510
REPORT DATE: August 18, 1999

ORDER ID: 3386
DATE RECEIVED: August 2, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

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, 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

CLIENT: Griffin International
PROJECT: Brandon Exxon/#49941510
REPORT DATE: August 18, 1999

ORDER ID: 3386
DATE RECEIVED: August 2, 1999
SAMPLER: TC/BS
ANALYST: 820

Ref. Number: 141971 | Site: MW-1 | Date Sampled: July 30, 1999 | Time: 3:42 PM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	8/12/99

Ref. Number: 141972 | Site: MW-2 | Date Sampled: July 30, 1999 | Time: 3:28 PM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	10.8	mg/L	SW 8015B	8/13/99

Ref. Number: 141973 | Site: MW-3 | Date Sampled: July 30, 1999 | Time: 3:30 PM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	26.2	mg/L	SW 8015B	8/12/99

Ref. Number: 141974 | Site: MW-4 | Date Sampled: July 30, 1999 | Time: 3:35 PM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	8/13/99

ENDYNE, INC.

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

4994150 ORC

SITOD#5994153

CHAIN-OF-CUSTODY RECORD

Project Name: Brandon Exxon Site Location: Brandon VT	Reporting Address: Griffin	Billing Address:
Endyne Project Number: 3386	Company: Griffin Contact Name/Phone #: Trina Cuyler	Sampler Name: T Cuyler, B Stopford Phone #: 802

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
141971	MW-1	H20	X		07308/1512	3	VOA/Hcl		8021B/8015DRO	HCl	
141972	MW-2				/1528						
141973	MW-3				/1530						
141974	MW-4				/1535						
141975	DUPLICATE				/1539	2			8021B		
141976	TRIP BLANK				/0900	2					

Relinquished by: Signature: Trina Cuyler	Received by: Signature: [illegible]	Date/Time: 07309/1730
Relinquished by: Signature: [illegible]	Received by: Signature: Alison Howard	Date/Time: 8/1/19 10:30

New York State Project: Yes ____ No X

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):										

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: Brandon Exxon/#49941510
REPORT DATE: August 10, 1999
DATE SAMPLED: July 30, 1999

ORDER ID: 3386
REF.#: 141,971 - 141,976

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

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Brandon Exxon/#49941510
CLIENT PROJ. #: 49941510

DATE RECEIVED: August 2, 1999
REPORT DATE: August 10, 1999
ORDER ID: 3386

Ref. #:	141,971	141,972	141,973	141,974	141,975
Site:	MW-1	MW-2	MW-3	MW-4	Duplicate
Date Sampled:	7/30/99	7/30/99	7/30/99	7/30/99	7/30/99
Time Sampled:	3:42	3:28	3:30	3:35	3:39
Sampler:	T.C. & B.S.	T.C. & B.S.	T.C. & B.S.	T.C. & B.S.	T.C. & B.S.
Date Analyzed:	8/9/99	8/9/99	8/10/99	8/9/99	8/10/99
UIP Count:	>10	>10	>10	4	4
Dil. Factor (%):	100	5	2	100	100
Surr % Rec. (%):	97	91	91	92	94
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
MTBE	61.0	<200	<500	<10	<10
Benzene	TBQ <1	25.0	TBQ <50	<1	<1
Toluene	<1	285.	301.	<1	<1
Ethylbenzene	<1	742.	783.	<1	<1
Xylenes	<1	2,900.	6,070.	<1	<1
1,3,5 Trimethyl Benzene	TBQ <1	307.	1,100.	<1	<1
1,2,4 Trimethyl Benzene	TBQ <1	1,030.	3,510.	<1	<1
Naphthalene	<1	193.	431.	<1	<1

Ref. #:	141,976
Site:	Trip Blank
Date Sampled:	7/30/99
Time Sampled:	7:00
Sampler:	T.C. & B.S.
Date Analyzed:	8/10/99
UIP Count:	0
Dil. Factor (%):	100
Surr % Rec. (%):	91
Parameter	Conc. (ug/L)
MTBE	<10
Benzene	<1
Toluene	<1
Ethylbenzene	<1
Xylenes	<1
1,3,5 Trimethyl Benzene	<1
1,2,4 Trimethyl Benzene	<1
Naphthalene	<1

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

ENDYNE, INC. # 49941510 [illegible] 2-Org 32542

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

BITOB#59941538

CHAIN-OF-CUSTODY RECORD

Project Name: Brandon Exxon Site Location: Brandon VT	Reporting Address: Griffin	Billing Address: Griffin
Endyne Project Number: 3386	Company: Griffin Contact Name/Phone #: Trina Cups	Sampler Name: [illegible] Phone #: [illegible]

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
141971	MW-1	H2O	X		073099/1542	3	40ml VOA		8021B / 8015 DRO	HCl	
141972	MW-2	↓	↓		/1528	↓	↓		↓	↓	
141973	MW-3				/1530						
141974	MW-4				/1535	↓			↓		
141975	DUPLICATE				/1539	2			8021B		
141976	TRIP BLANK	↓	↓		/0900	2	↓		↓	↓	

Relinquished by: Signature Trina Cups	Received by: Signature [signature]	Date/Time 073099 / 1730 10.2
Relinquished by: Signature [signature]	Received by: Signature Alison Howard	Date/Time [illegible]

New York State Project: Yes ____ No X

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):										

ENDYNE, INC.

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

32542

CHAIN-OF-CUSTODY RECORD

Project Name: Exxon Site Location:	Reporting Address:	Billing Address:
Endyne Project Number:	Company: Contact Name/Phone #:	Sampler Name: Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	MW-1	H2O	X								
	MW-2										
	MW-3										
	MW-4										
	DUPLICATE					2					
	TRIP BLANK					2					

Relinquished by: Signature	Received by: Signature	Date/Time
Relinquished by: Signature	Received by: Signature	Date/Time

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):										