GRIFFIN INTERNATIONAL INC

MAY 04 2001

May 2, 2001

Mr. Chuck Schwer
Vermont ANR/DEC
Waste Management Division
103 South Main St. /West Building
Waterbury, VT 05671-0404

RE: Initial Investigation of Suspected Subsurface Petroleum Contamination, McLellan's Garage, Danby, VT, (VTDEC #96-2043)

Dear Mr. Schwer:

Enclosed please find the summary report for the site investigation conducted at the above referenced site.

Please contact me if you have any questions or comments.

Sincerely,

Timothy Kelly, PG
Staff Geologist

Enclosure

c.: David McLellan (w/o enclosure)
GI#9964905

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 SUSPECTED SUBSURFACE PETROLEUM CONTAMINATION

McLELLAN'S GARAGE
1300 ROUTE 7
DANBY, VERMONT

(VTDEC SITE #96-2043)
GI #9964905

April 2001

Prepared for

David McLellan
McLellan's Garage
1300 Route 7
Danby, VT 05739

Prepared by

P.O. Box 943
Williston, Vermont 05495
(802) 865-4288

TABLE OF CONTENTS

I. INTRODUCTION

This report summarizes the initial investigation of suspected subsurface petroleum contamination at McLellan's Garage (the Site) at 1300 Route 7, Danby, Vermont (see Site Location Map, Appendix A [1]). Site investigation activities were undertaken in response to the detection of subsurface contamination during the closure of one 3,000-gallon gasoline underground storage tank (UST) and one 4,000-gallon gasoline UST on August 14, 1996. Results of the following investigative tasks performed by Griffin International, Inc. (Griffin), are presented:

- ◊ monitoring well installation;
- ◊ site survey;
- ◊ determination of groundwater flow direction and gradient;
- ◊ groundwater sampling and analyses;
- ◊ sensitive receptor survey.

This work was requested by Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Mr. David McLellan dated July 28, 2000. This work was performed in accordance with the October 27, 2000, *Work Plan and Cost Estimate for a Subsurface Investigation of Suspected Petroleum Contamination* prepared by Griffin. The work plan was approved by Mr. McLellan in a telephone conversation with Mr. Timothy Kelly of Griffin on October 30, 2000 and by Mr. Chuck Schwer of the VTDEC in a letter to Mr. McLellan dated January 30, 2001.

II. SITE BACKGROUND

A. Site History

On August 14, 1996, petroleum contamination was detected at the Site during the routine removal of one 3,000-gallon gasoline UST and one 4,000-gallon gasoline UST. Soil screening samples collected during the UST closure were screened for volatile organic compounds (VOCs) using a pre-calibrated HNu, Model PI-101 portable photoionization detector (PID) [2]. Soils collected from the excavation of the USTs had VOC readings up to 240 parts per million volume (ppmv) [2]. Groundwater was encountered in the excavation at a depth of 7.5 feet below grade. An apparent petroleum sheen was observed in on the water in the excavation. Soils removed from the tank excavation were used as backfill in the pit. Approximately 2.5 inches of petroleum product, which was believed to be old motor oil, were reported in a monitoring well near the existing well MW-3.

As a result of the petroleum contamination detected in the subsurface in the vicinity of the former USTs, the VTDEC requested that additional work be conducted at the Site in order to determine the extent and degree of petroleum contamination.

B. Site Description

McLellan's Garage is located on the west side of Route 7. One garage/office building is located on the Site. The site is bordered to the south by a Depot Street, across which is a vacant lot used

for parking. Southeast of the Site is a commercial building, which was apparently unoccupied at the time of the drilling. To the east, across Route 7 is a lumberyard. North and west of the Site are residential properties. The site and surrounding area are serviced by municipal water and sewer.

C. Site Geology

According to the *Surficial Geologic Map of Vermont* [3], the Site is underlain by Recent (less than 10,000 years old) fluvial sands and gravels. Based on a review of the *Centennial Geologic Map of Vermont* [4], bedrock below the Site is mapped as the buff weathering, pink, buff, and gray dolomite of the Winooski formation and also the interbedded quartzite and dolomite of the Danby and Potsdam formations.

III. INVESTIGATIVE PROCEDURES

To further define the extent of subsurface petroleum contamination in the area of the former USTs, the following investigative tasks were undertaken: soil borings; monitoring well installations; determination of groundwater flow direction and gradient; groundwater sample collection and analyses for petroleum related constituents; and a sensitive receptor survey.

A. Monitoring Well Installation

Monitoring wells MW-1 and MW-2 are pre-existing, former leak detection wells, which are located in an apparent upgradient position from the source area. The depth to the bottom of MW-1 was measured as 12.3 feet below the top of the polyvinyl chloride (PVC) casing (btoc). The depth to the bottom of MW-2 was measured as 14.05 feet btoc. MW-1 and MW-2 were observed to be constructed of two-inch inside diameter, schedule 40 PVC. As observed on February 8, 2001, MW-1 and MW-2 were completed with eight-inch diameter roadboxes mounted flush with grade. No additional construction information or stratigraphic information was available on February 8, 2001.

Two shallow monitoring wells, MW-3 and MW-4, were installed on February 8, 2001, by Adams Engineering, of Underhill, Vermont, under the direct supervision of a Griffin geologist. The monitoring well locations are indicated on the Site Map (Appendix A).

During borehole advancement, a five-foot sampler was advanced by high-frequency vibration and hydraulic pressure to collect each soil sample. Soil samples collected from the borings were logged by the supervising geologist and screened for the presence of VOCs using an HNu™ systems Model PI-101 PID equipped with a 10.2 eV lamp. Prior to screening, the PID was calibrated with isobutylene referenced to benzene. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards. Soil characteristics and contaminant concentrations were recorded by the geologist in detailed well logs, which are presented in Appendix B.

Monitoring well MW-3 was installed in the vicinity of the garage. Monitoring well MW-4 was installed southeast of the former USTs and the pump island, in a presumed downgradient direction from the source area.

Soil encountered in the borings for MW-3 and MW-4 consisted primarily of gray to olive to light brown gravel and sand with local silt layers. The soil boring for MW-3 was drilled to 12 feet below grade. Groundwater was encountered at approximately 4.7 feet below grade in t MW-3. MW-4 was also drilled to 12 feet below grade. Groundwater was also encountered at approximately 4.7 feet below grade in MW-4. The sediments encountered in these two soil borings were consistent with the interpretation of the *Surficial Geologic Map of Vermont* [3].

VOCs were measured in the soil-screening samples from two feet to 12 feet below grade in MW-3 at 15 to 20 ppmv. VOCs were measured in the soil screening samples from collected from two feet below grade to 11 feet below grade in MW-4 at 20 to 162 ppmv; the soil sample collected from 11-12 feet below grade was measured at 15 ppmv.

MW-3 and MW-4 were completed with 1.5-inch diameter, Schedule 40 PVC riser and factory-slotted screened intervals (0.010-inch slots). A silica sand pack was installed in the annular space surrounding the screened interval. The sand pack was brought to a minimum of 0.5 foot above the top of the screened interval in each well. A bentonite seal approximately 0.7 foot thick was installed in the annular space immediately above the sand pack. MW-3 and MW-4 were completed with a flush-mounted road box suitable for vehicular traffic, driven into the asphalt, sealed with concrete, and secured with a compression cap. For specific well construction, see the Boring Log and Well Construction Diagrams in Appendix B.

B. Groundwater Flow Direction and Gradient

The four wells were located in azimuth and elevation for inclusion on the Site Map presented in Appendix A. The top of PVC casing in MW-2 was assigned an arbitrary elevation of 100.00 feet. Water table elevation measurements were collected from the four on-site monitoring wells on February 16, 2001. The depth to water in each well was subtracted from the top of casing elevation to obtain the relative water table elevation. Water level data are presented in Appendix C. Minor sheens were observed in MW-3 and MW-4 on February 16, 2001. Water table elevations were plotted on the Site Map to generate the Groundwater Contour Map presented in Appendix A.

The depth to groundwater measured on February 16, 2001, in the four site monitoring wells ranged from 3.5 to 4.6 feet btoc. The water table elevations measured on February 16, 2001 indicate a groundwater flow at the site to the southeast at an approximate hydraulic gradient of 1.1%, apparently toward the southeast. Based on this flow direction, monitoring wells MW-3 and MW-4 are located in downgradient directions from the source area, and monitoring wells MW-1 and MW-2 are located in a upgradient direction from the source area.

C. Groundwater Sampling and Analyses

Griffin collected groundwater samples from the four on-site monitoring wells on February 16, 2001. The water samples were analyzed by Endyne, Inc. of Williston, Vermont, via EPA Method 8021B for the presence of benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), naphthalene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene. The groundwater samples were also analyzed for total petroleum hydrocarbons by EPA Method 8015B for gasoline range organics (DRO).

Results of the laboratory analyses for the monitoring wells are summarized in Appendix D. The laboratory analysis report is contained in Appendix E. Analytical results of the trip blank and duplicate samples indicate that adequate quality assurance and quality control were maintained during sample collection and analysis.

The following are the results of the analyses of samples collected from the on-site monitoring wells on February 16, 2001:

- No petroleum-related VOCs were reported in the groundwater sample collected from MW-1; no TPHs were reported in the sample collected from MW-1;

- 1,2,4-Trimethylbenzene (1,2,4-TMB) was reported at a concentration below the applicable Vermont Groundwater Enforcement Standard (VGES) in the sample collected from MW-2; no TPHs were reported in MW-2;

- Benzene, 1,2,4-TMB, and naphthalene were reported at concentrations above the applicable VGES in the samples collected from MW-3; toluene, ethylbenzene, xylenes, and 1,3,5-TMB were reported at a concentration below the applicable VGES in the sample collected from MW-3; TPHs were reported in the sample collected from MW-3; there is no VGES for TPHs;

- Benzene, toluene, ethylbenzene, 1,3,5-TMB, 1,2,4-TMB, and naphthalene were reported at concentrations above the applicable VGES in the samples collected from MW-4; TPHs were reported in the sample collected from MW-4; there is no VGES for TPHs;

D. Sensitive Receptor Survey

A qualitative risk assessment was conducted to identify known and potential receptors of the petroleum impact reported at the site. A visual survey was conducted during the monitoring well installation on February 8, 2001. Based on these observations, a determination of the potential risk to identified receptors was made. Soil and groundwater in the vicinity of the former USTs are identified as receptors of the petroleum impact detected.

The nearest surface water is an unnamed tributary to the Otter Creek. The unnamed tributary is located approximately 900 feet southeast of the site. The risk to the unnamed tributary is considered minimal at this time given the distance from the Site.

Risks of vapor impact to the existing on-site office/repair garage building were determined to be minimal because the building is built with a slab on grade construction. Therefore, the on-site building was not screened for VOCs with a PID. In addition, the on-site building and the buildings in the surrounding area are serviced by municipal water service. One commercial building, which was apparently unoccupied at the time of the drilling, was observed in the downgradient direction, with respect to the shallow surficial aquifer, from the location of the former source area. This building was not screened for VOCs during the drilling or sampling

because the building was not accessible. No impacts due to the presence of vapors in this building have been reported to date.

IV. CONCLUSIONS

Based on the results of this initial site investigation at McLellan's Garage, Griffin presents the following conclusions:

1) There was an apparent release(s) of petroleum to the subsurface in the vicinity of the 3,000-gallon and 4,000-gallon gasoline USTs formerly located at the site. The duration and volume of product released is unknown. The source of the petroleum contamination (i.e., the UST system) was removed in August of 1996.

2) VOC readings of soils collected during the UST closure in August of 1996 and this investigation indicate the presence of petroleum compounds in on-site soils in the vicinity of these two former gasoline USTs. With the source USTs eliminated, it is expected that petroleum compound concentrations in the soil will decrease over time with the progressive action of natural mitigative processes including dissolution and volatilization.

3) Two groundwater monitoring wells, MW-1 and MW-2, were previously installed at the site. The depth to the bottom of MW-1 was measured as 12.3 feet btoc, and the depth to the bottom of MW-2 was measured as 14.05 feet btoc on February 8, 2001. MW-1 and MW-2 were observed to be constructed of two-inch inside diameter, schedule 40 PVC. As observed on February 8, 2001, MW-1 and MW-2 were completed with eight-inch diameter roadboxes mounted flush with grade. No additional construction information or stratigraphic information was available on February 8, 2001.

4) Two groundwater monitoring wells, MW-3 and MW-4, were installed by Griffin at the Site on February 8, 2001. Monitoring wells MW-1 and MW-2 are pre-existing, former leak detection wells, which are located in an apparent upgradient position from the source area. VOCs were measured with the PID at concentrations ranging from 15 to 20 ppmv in the soils collected from the MW-3 borehole and from 20 to 162 ppmv in the soils collected from the MW-4 borehole.

5) The depth to groundwater measured on February 16, 2001, in the four site monitoring wells ranged from 3.5 to 4.6 feet below grade. The shallow groundwater flow beneath the site on this date was to the southeast, toward an unnamed tributary to the Otter Creek, at an apparent hydraulic gradient of approximately 1.1%.

6) Groundwater samples were collected from the four site monitoring wells on February 16, 2001. Concentrations of select petroleum compounds reported in the groundwater samples collected from MW-3 and MW-4 exceeded the applicable VGESs. With the source USTs removed, it is expected that dissolved petroleum compound concentrations will decease over time with the progressive action of natural mitigative processes, including dilution, dispersion, and biodegradation. No dissolved petroleum constituents were report in the upgradient monitoring well MW-1. 1,2,4-TMB was reported at a

concentration below the applicable VGES in the sample collected from MW-2. No TPHs were reported in the groundwater samples collected from MW-1 or MW-2. TPHs were reported in the samples collected from MW-3 and MW-4; there is no VGES for TPHs.

7) The site and the surrounding area are served by municipal water and sewer services.

V. RECOMMENDATIONS

Based on the results of this site investigation, Griffin recommends the following.

1) Because select compounds were reported in the on-site groundwater at concentrations exceeding their applicable VGES, a confirmatory round of groundwater samples should be collected from the four on-site monitoring wells in May 2001. Samples should be analyzed by EPA Method 8021B for presence of petroleum-related VOCs. The frequency and need of future sampling will be reassessed following the May 2001 sampling event.

2) An attempt should be made to screen the building southeast of the site for VOCs with a PID during the May 2001 site visit.

VI. REFERENCES

1. USGS 7.5 Minute Topographic Maps, Danby (1986, Provisional) and Dorset (1967), Vermont Quadrangles.

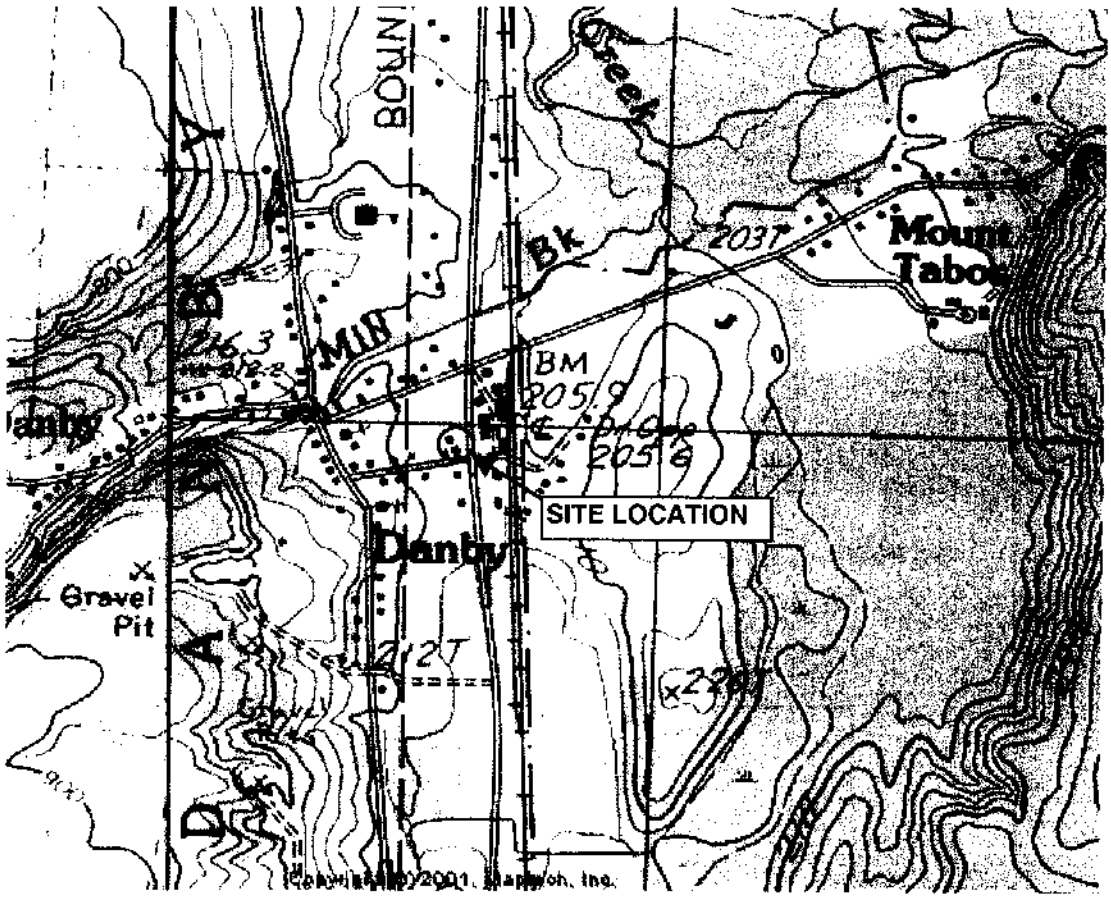
2. Griffin International, Inc, August 16, 1996, *UST Closure Inspection*, McLellan's Garage, Route 7, Danby, Vermont, letter report to the Vermont Department of Environmental Conservation, Underground Storage Tank Program.

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

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

APPENDIX A

Site Location Map
Site Map
Groundwater Contour Map
Contaminant Distribution Map



Griffin Project: *9964905*

Source: *USGS Topographic Maps, Danby (1986, Provisional) and Dorset (1967), Vermont Quadrangles*

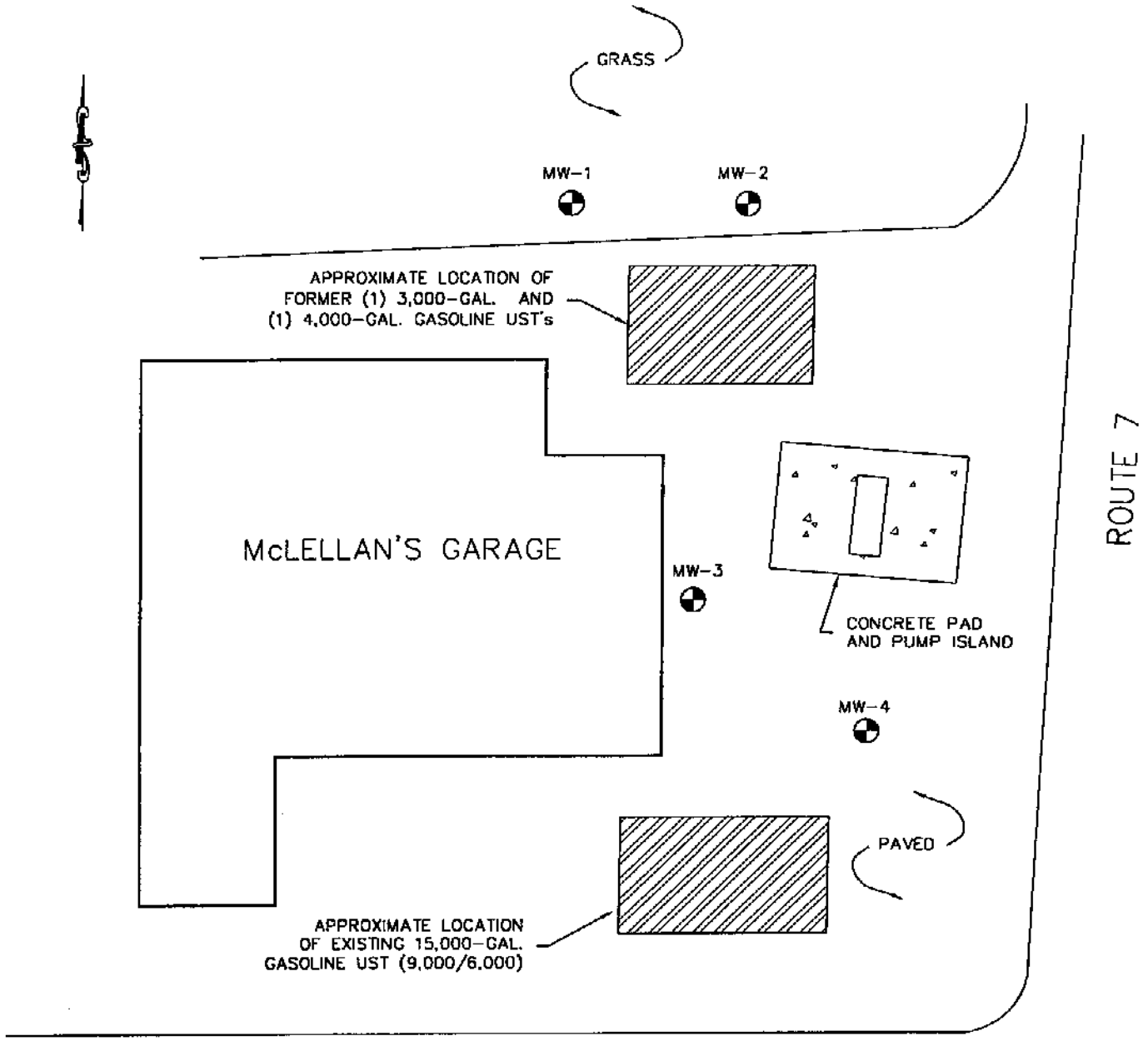
GRIFFIN INTERNATIONAL

McLellan's Garage
Danby, Vermont

Site Location Map

VTDEC Site # 96-2043

Date: 04/09/01	Drawing No. 0	Scale: 1:13,724	By: TK



LEGEND

MW-2 MONITORING WELL

JOB #: 9964905 VTDEC SITE #: 96-2043

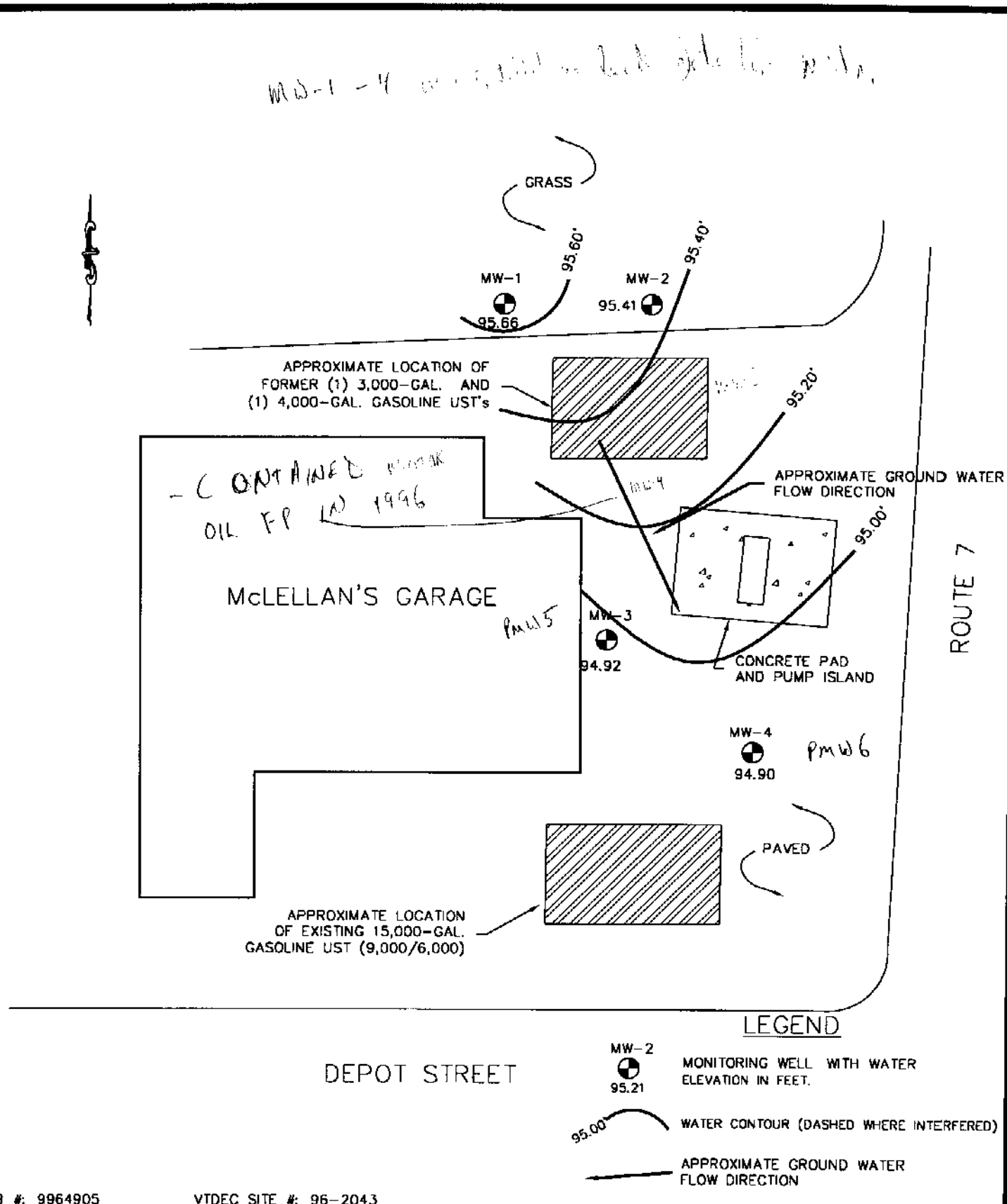
GRIFFIN INTERNATIONAL INC

McLELLAN'S GARAGE

1300, ROUTE 7, DANBY, VERMONT

SITE MAP

DATE: 2/13/01	DWG.#: 1	SCALE: 1"= 20'	DRN.: MP	APP.: TK



JOB #: 9964905 VTDEC SITE #: 96-2043

GRIFFIN INTERNATIONAL INC

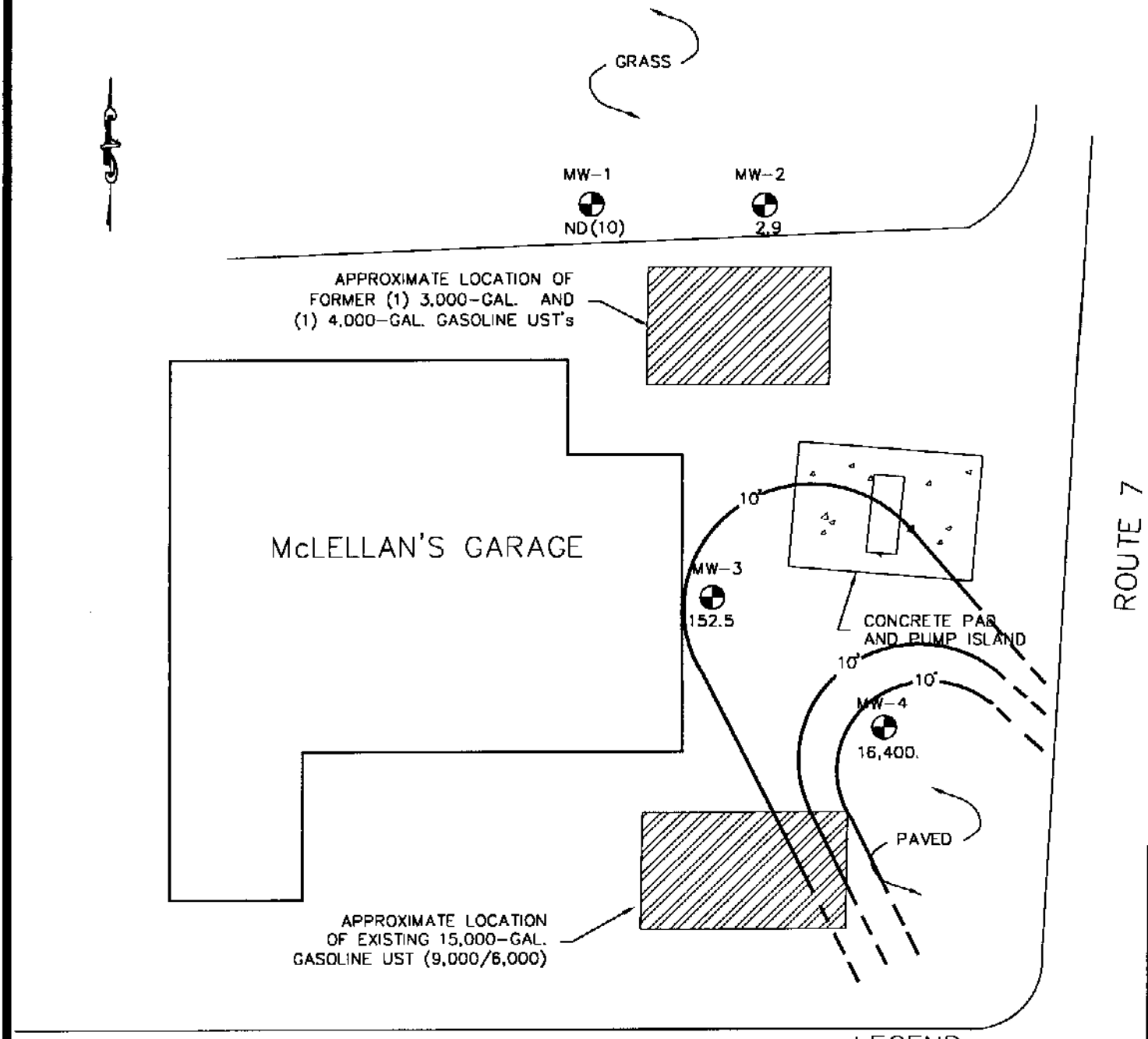
McLELLAN'S GARAGE

1300, ROUTE 7, DANBY, VERMONT

GROUND WATER CONTOUR MAP

SAMPLE DATE: 2/16/01

DATE: 4/3/01	DWG#: 2	SCALE: 1"=20'	DRN.: MP/DM	APP.:



LEGEND

MW-2 / 2.9 — MONITORING WELL AND TOTAL CONCENTRATION IN ppb (METHOD 8021B)

10 — CONTAMINATION CONCENTRATION CONTOUR

ND — NOT DETERMINED

JOB #: 9964905 VTDEC SITE #: 96-2043

GRIFFIN INTERNATIONAL INC.

McLELLAN'S GARAGE

1300, ROUTE 7, DANBY, VERMONT

CONTAMINANT CONCENTRATION MAP

SAMPLE DATE: 2/16/01

DATE: 4/3/01	DWG#: 3	SCALE: 1"=20'	DRN.: MP/DM	APP.:

APPENDIX B

Soil Logs and Monitoring Well Specifications

- plume extent not defined
- pre-existing MW's 3 & 4 not sampled
  4 3 had 2.5' product in 1996 reported
- neighboring properties not shown
- sewer with PID down gradient property
- location of utility corridors?

BORING LOG AND WELL CONSTRUCTION DIAGRAM

Well No: MW-3

McLELLAN'S GARAGE
DANBY, VERMONT

GRIFFIN INTERNATIONAL

Griffin Project #:	9964905	Date Installed:	2/8/2001
Drilled by :	Adams Engineering	Drilling Method:	Vibratory
Driller:	Gerry Adams	Boring Diameter.:	2.75"
Supervised by:	TJK	Development Method:	Peristaltic pump
Logged by:	TJK	Screened Length:	10 Ft.

Grade = 0	Well Construction	Pen/Rec (") / Blow Count	Interval (') / PID (ppm)	Soil Characteristics: Asphalt Surface	Letter Symbol	Graphic Symbol
0.40				Augered through frost.		
0.80						
1.20	Ft<Grade					
1.60						
2.00						
2.40		36"/28"	2' - 5'	SILTY GRAVEL WITH SAND (GM) --	GM	
2.80		N/A	20	moist, olive gray, petroleum odor		
3.20	2/16/01					
3.60	3.84'					
4.00						
4.40						
4.80						
5.20	2/8/01	60"/14"	5' - 10'	SILTY GRAVEL WITH SAND (GM) --	GM	
5.60	4.7'	N/A	15	moist to wet, grayish brown, petroleum odor, cobbles		
6.00						
6.40						
6.80						
7.20						
7.60						
8.00						
8.40						
8.80						
9.20						
9.60						
10.00		24"/12"	10.0' - 12.0'	SILTY GRAVEL WITH SAND (GM) --	GM	
10.40		N/A	18.8	wet, olive gray		
10.80						
11.20						
11.60						
12.00						
12.40			12.0'	Base of Exploration.		
12.80						
13.20						
13.60						
14.00						
14.40						
14.80						
15.20						
15.60						
16.00						

Legend

- Road Box with Bolt Down Cover, Set in Cement.
- Existing Surface.
- Bentonite Seal Placed in Annulus.
- Grade #1 Silica Sand Pack Placed in Annulus.
- Drill Cuttings Placed in Annulus.
- BR Bedrock
- NR - Not Recorded
- N/A - Not Applicable
- Locking Plug.
- 1.5" ID, Schedule 40 PVC Riser.
- 1.5" ID, Schedule 40 PVC, 0.010"-Slotted Well Screen
- Plug Point
- Approximate Water Level During Drilling
- Static Water Level

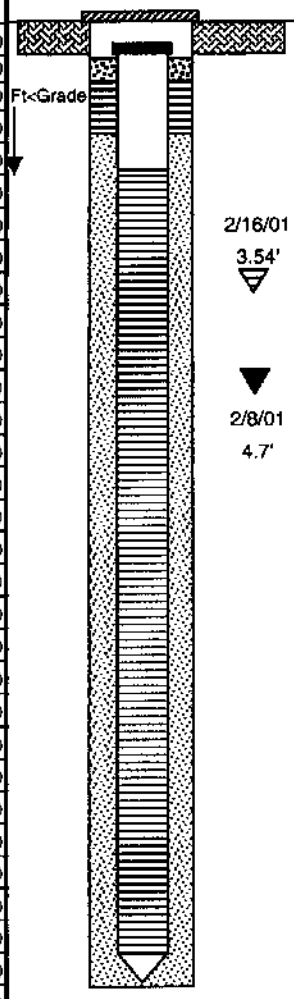
BORING LOG AND WELL CONSTRUCTION DIAGRAM

Well No: MW-4

McLELLAN'S GARAGE
DANBY, VERMONT

GRIFFIN INTERNATIONAL

Griffin Project #:	9964905	Date Installed:	2/8/2001
Drilled by :	Adams Engineering	Drilling Method:	Vibratory
Driller:	Gerry Adams	Boring Diameter.:	2.75"
Supervised by:	TJK	Development Method:	Peristaltic pump
Logged by:	TJK	Screened Length:	10 Ft.



Well Construction	Pen/Rec (") / Blow Count	Interval (') / PID (ppm)	Soil Characteristics	Letter Symbol	Graphic Symbol
			Asphalt Surface		
			Augered through frost.		
	36"/35"	2' - 5'	SILTY (ML) --	ML	
	N/A	35	moist, dark brown to olive, petroleum odor		
	60"/21"	5' - 10'	SILTY SAND WITH GRAVEL (SM) --	SM	
	N/A	20	wet, olive and gray, petroleum odor, cobbles		
	24"/23"	10.0' - 11.0'	POORLY GRADED GRAVEL WITH SILT AND SAND	GP-	
	N/A	162	(GP-GM) -- wet, light brown	GM	
		11.0' - 12.0'	SILT (ML/CL) --	ML/	
		15	wet, light brown	CL	
		12.0'	Base of Exploration.		

Legend

- Road Box with Bolt Down Cover, Set in Cement.
- Existing Surface.
- Bentonite Seal Placed in Annulus.
- Grade #1 Silica Sand Pack Placed in Annulus.
- Drill Cuttings Placed in Annulus.
- **BR** Bedrock
- NR - Not Recorded
- N/A - Not Applicable
- Locking Plug.
- 1.5" ID, Schedule 40 PVC Riser.
- 1.5" ID, Schedule 40 PVC, 0.010"-Slotted Well Screen
- Plug Point
- Approximate Water Level During Drilling
- Static Water Level

APPENDIX C

Liquid Level Monitoring Data

Liquid Level Monitoring Data

Monitoring Date: 2/16/01

Well I.D.	Top of Casing Elevation	Depth to Product	Depth to Water	Water Table Elevation
MW-1	100.13	-	4.47	95.66
MW-2	100.00	-	4.59	95.41
MW-3	98.76	-	3.84	94.92
MW-4	98.44	-	3.54	94.90

Note: All values reported in feet.
NM = Not Measured
Surveyed by Griffin International, Inc., 2/2/01

APPENDIX D

Groundwater Quality Data

Groundwater Quality Data

MW-1

PARAMETER	2/16/01				VGES
MTBE	ND(10.0)				**40**
Benzene	ND(1.0)				**5**
Toluene	ND(1.0)				**1000**
Ethylbenzene	ND(1.0)				**700**
Xylenes	ND(1.0)				**10000**
Total BTEX	ND(1.0)				-
1,3,5-Trimethylbenzene	ND(1.0)				**4**
1,2,4-Trimethylbenzene	ND(1.0)				**5**
Naphthalene	ND(1.0)				**20**
Total Targeted VOCs	ND(10.0)				-
TPH GRO (mg/L)	ND(0.2)				

MW-2

PARAMETER	2/16/01				VGES
MTBE	ND(10.0)				**40**
Benzene	ND(1.0)				**5**
Toluene	ND(1.0)				**1000**
Ethylbenzene	ND(1.0)				**700**
Xylenes	ND(1.0)				**10000**
Total BTEX	ND(1.0)				-
1,3,5-Trimethylbenzene	ND(1.0)				**4**
1,2,4-Trimethylbenzene	**2.9**				**5**
Naphthalene	ND(1.0)				**20**
Total Targeted VOCs	**2.9**				-
TPH GRO (mg/L)	ND(0.2)				

All values reported in ug/L (ppb) unless otherwise noted.
Detections are **Bold**
VGES - Vermont Groundwater Enforcement Standard, effective 1/20/2000
Values greater than the applicable VGES are shaded
NA - Not Analyzed
ND(1000) - Not Detected (Detection Limit)
TBQ(1) - Trace Below Quantitation Limit (Detection Limit)

Groundwater Quality Data

MW-3

PARAMETER	2/16/01				VGES
MTBE	ND(10)				**40**
Benzene	**91.1**				**5**
Toluene	**10.5**				**1000**
Ethylbenzene	**3.4**				**700**
Xylenes	**10.9**				**10000**
Total BTEX	**115.9**				-
1,3,5-Trimethylbenzene	**1.8**				**4**
1,2,4-Trimethylbenzene	**10.6**				**5**
Naphthalene	**24.2**				**20**
Total Targeted VOCs	**152.5**				-
TPH GRO (mg/L)	**6.09**				

MW-4

PARAMETER	2/16/01				VGES
MTBE	ND(200.)				**40**
Benzene	**945.**				**5**
Toluene	**2,620.**				**1000**
Ethylbenzene	**1,820.**				**700**
Xylenes	**8,010.**				**10000**
Total BTEX	**13,395.**				-
1,3,5-Trimethylbenzene	**681.**				**4**
1,2,4-Trimethylbenzene	**2,140.**				**5**
Naphthalene	**184.**				**20**
Total Targeted VOCs	**16,400.**				-
TPH GRO (mg/L)	**96.9**				

All values reported in ug/L (ppb) unless otherwise noted.
Detections are **Bold**
VGES - Vermont Groundwater Enforcement Standard, effective 1/20/2000
Values greater than the applicable VGES are shaded
NA - Not Analyzed
ND(1000) - Not Detected (Detection Limit)
TBQ(1) - Trace Below Quantitation Limit (Detection Limit)

APPENDIX E

Analytical Laboratory Reports: Groundwater

ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

Griffin International
PO Box 943
Williston, VT 05495
Attn: Tim Kelly

PROJECT: Mclellan Garage/#9964905
ORDER ID: 11329
RECEIVE DATE: February 19, 2001
REPORT DATE: February 22, 2001

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 include 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

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

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Mclellan Garage/#9964905
REPORT DATE: February 22, 2001

ORDER ID: 11329
DATE RECEIVED: February 19, 2001
SAMPLER: RD

Site: MW-1
Ref. Number: 169240
Anal. Method: SW 8021B
Date Sampled: 2/16/01
Time Sampled: 11:26 AM
Analysis Date: 2/19/01
Analyst: 222

Parameter	Results ug/L
MTBE	< 10.0
Benzene	< 1.0
Toluene	< 1.0
Ethylbenzene	< 1.0
Xylenes, Total	< 1.0
1,3,5 Trimethyl Benzene	< 1.0
1,2,4 Trimethyl Benzene	< 1.0
Naphthalene	< 1.0
UIP's	0.
Surrogate 1	105.%

Site: MW-3
Ref. Number: 169242
Anal. Method: SW 8021B
Date Sampled: 2/16/01
Time Sampled: 12:22 PM
Analysis Date: 2/19/01
Analyst: 222

Parameter	Results ug/L
MTBE	< 10.0
Benzene	91.1
Toluene	10.5
Ethylbenzene	3.4
Xylenes, Total	10.9
1,3,5 Trimethyl Benzene	1.8
1,2,4 Trimethyl Benzene	10.6
Naphthalene	24.2
UIP's	>10.
Surrogate 1	105.%

Site: Duplicate
Ref. Number: 169244
Anal. Method: SW 8021B
Date Sampled: 2/16/01
Time Sampled: 11:42 AM
Analysis Date: 2/20/01
Analyst: 222

Parameter	Results ug/L
MTBE	< 10.0
Benzene	< 1.0
Toluene	< 1.0
Ethylbenzene	< 1.0
Xylenes, Total	< 1.0
1,3,5 Trimethyl Benzene	< 1.0
1,2,4 Trimethyl Benzene	2.5
Naphthalene	< 1.0
UIP's	4.
Surrogate 1	105.%

Site: MW-2
Ref. Number: 169241
Anal. Method: SW 8021B
Date Sampled: 2/16/01
Time Sampled: 11:42 AM
Analysis Date: 2/20/01
Analyst: 222

Parameter	Results ug/L
MTBE	< 10.0
Benzene	< 1.0
Toluene	< 1.0
Ethylbenzene	< 1.0
Xylenes, Total	< 1.0
1,3,5 Trimethyl Benzene	< 1.0
1,2,4 Trimethyl Benzene	2.9
Naphthalene	< 1.0
UIP's	4.
Surrogate 1	105.%

Site: MW-4
Ref. Number: 169243
Anal. Method: SW 8021B
Date Sampled: 2/16/01
Time Sampled: 12:02 PM
Analysis Date: 2/19/01
Analyst: 222

Parameter	Results ug/L
MTBE	< 200.
Benzene	945.
Toluene	2,620.
Ethylbenzene	1,820.
Xylenes, Total	8,010.
1,3,5 Trimethyl Benzene	681.
1,2,4 Trimethyl Benzene	2,140.
Naphthalene	184.
UIP's	>10.
Surrogate 1	99.%

Site: Trip Blank
Ref. Number: 169245
Anal. Method: SW 8021B
Date Sampled: 2/16/01
Time Sampled: 8:30 AM
Analysis Date: 2/19/01
Analyst: 222

Parameter	Results ug/L
MTBE	< 10.0
Benzene	< 1.0
Toluene	< 1.0
Ethylbenzene	< 1.0
Xylenes, Total	< 1.0
1,3,5 Trimethyl Benzene	< 1.0
1,2,4 Trimethyl Benzene	< 1.0
Naphthalene	< 1.0
UIP's	0.
Surrogate 1	102.%

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41325

Project Name: McLellan's Garage #996905	Reporting Address: Griffin	Billing Address: Griffin
Endyne Order ID: (Lab Use Only) 11329 (2-O, -I, -S)	Company: Contact Name/Phone #: RU TK	Sampler Name: RO Phone #:

Ref # (Lab Use Only)	Sample Identification	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
169240	MW-1	H_2O	X		1126	3	40ml	8021B & 8015GRO	(19) (22)	HCl	
169241	MW-2				1142						
169242	MW3				1222						
169243	MW-4				1202	9					
169244	DUPLICATE				1142	2					
169245	TRIP BLANK				0830	2					

Relinquished by:	Date/Time	Received by:	Date/Time	Received by:	Date/Time
	2/14/01	Melissa Salmon	2/19/01 9:40AM		2-19-01 10:00

New York State Project: Yes ____ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Sulfate	21	1664 TPH/FOG	26	8270 PAH
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	(22)	8015 GRO	27	PP13 Metals
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	8015 DRO	28	RCRA8 Metals
4	Nitrite N	9	BOD	14	Turbidity	(19)	8021B	24	8260/8260B	29	
5	Nitrate N	10	Alkalinity	15	Conductivity	20	8010/8020	25	8270 B/N or Acid	30	
31	Metals (As Is, Total, Diss.) Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si, Sr, Ti, Tl, V, Zn										
32	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)					33					
34	Other										

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ENDYNE, INC.

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LABORATORY REPORT

Griffin International
PO Box 943
Williston, VT 05495
Attn: Tim Kelly

PROJECT: Mclellan Garage/#9964905
ORDER ID: 11329
RECEIVE DATE: February 19, 2001
REPORT DATE: March 1, 2001

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 include 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

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Williston, Vermont 05495
(802) 879-4333
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LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Mclellan Garage/#9964905
REPORT DATE: March 1, 2001

ORDER ID: 11329
DATE RECEIVED: February 19, 2001
SAMPLER: RD
ANALYST: 725

Ref. Number: 169240 | Site: MW-1 | Date Sampled: February 16, 2001 | Time: 11:26 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 GRO	< 0.20	mg/L	SW 8015B	2/27/01

Ref. Number: 169241 | Site: MW-2 | Date Sampled: February 16, 2001 | Time: 11:42 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 GRO	< 0.20	mg/L	SW 8015B	2/27/01

Ref. Number: 169242 | Site: MW-3 | Date Sampled: February 16, 2001 | Time: 12:22 PM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 GRO	6.09	mg/L	SW 8015B	2/27/01

Ref. Number: 169243 | Site: MW-4 | Date Sampled: February 16, 2001 | Time: 12:02 PM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 GRO	96.9	mg/L	SW 8015B	2/27/01

Ref. Number: 169244 | Site: Duplicate | Date Sampled: February 16, 2001 | Time: 11:42 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 GRO	< 0.20	mg/L	SW 8015B	2/27/01

Ref. Number: 169245 | Site: Trip Blank | Date Sampled: February 16, 2001 | Time: 8:30 AM

Parameter	Result	Unit	Method	Analysis Date
TPH 8015 GRO	< 0.20	mg/L	SW 8015B	2/27/01

Williston, Vermont 05495
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41325

Project Name:	Reporting Address:	Billing Address:
McLellan's Garage #996905	Griffin	Griffin
Endyne Order ID: (Lab Use Only) 11329	Company:	Sampler Name: RO
	Contact Name/Phone #: TK	Phone #:

Ref # (Lab Use Only)	Sample Identification	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
169240	MW-1	H_2O	X		2/16/01 1126	3	40ml	8021B & 8015GRO	(19) (22)	HCl	
169241	MW-2				1142						
169242	MW3				1222						
169243	MW-4				1202	9					
169244	DUPLICATE				1142	2					
169245	TRIP BLANK				0830	2					

Relinquished by:	Date/Time	Received by:	Date/Time	Received by:	Date/Time
	2/16/01	Melissa Salmon	2/19/01 9:40AM		2-19-01 10:00

New York State Project: Yes ____ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Sulfate	21	1664 TPH/FOG	26	8270 PAH
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	(22)	8015 GRO	27	PP13 Metals
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	8015 DRO	28	RCRA8 Metals
4	Nitrite N	9	BOD	14	Turbidity	(19)	8021B	24	8260/8260B	29	
5	Nitrate N	10	Alkalinity	15	Conductivity	20	8010/8020	25	8270 B/N or Acid	30	
31	Metals (As Is, Total, Diss.) Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si, Sr, Ti, Tl, V, Zn										
32	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)					33					
34	Other										

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