



APR 29 10 29 AM '99

April 27, 1999

Ms. Linda Elliott
Vermont ANR/DEC
Waste Management Division
103 South Main St. /West Building
Waterbury, VT 05671-0404

RE: Initial Investigation of Subsurface Petroleum Contamination
Charlie's Mobil, Bennington, Vermont (VT DEC Site #98-2470)

Dear Ms. Elliott:

Enclosed please find the summary report for the initial site investigation conducted at the above referenced site. This report has been forwarded to the Vermont Department of Environmental Conservation (VTDEC), as required, at the request of Mr. Charlie Wells.

Please contact me if you have any questions or comments regarding this report.

Sincerely,

Elizabeth Stopford
Environmental Engineer

Enclosure

cc: GI#19941462

**INITIAL INVESTIGATION OF
SUBSURFACE PETROLEUM CONTAMINATION AT
CHARLIE'S MOBIL**

APRIL 8, 1999

Site Location:

**Charlie's Mobil
216 Northside Drive
Bennington, VT**

**VTDEC SITE #98-2470
GI Project # 19941462**

Prepared For:

**Mr. Charlie Wells
Charlie's Mobil
216 Northside Drive
Bennington, VT 05201**

Prepared By:



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

APR 29 10 24 AM 1999

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I. INTRODUCTION

This report summarizes the initial investigation of suspected subsurface contamination at Charlie's Mobil, located at 216 Northside Drive in Bennington, VT (see location map in Appendix A). This investigation was conducted by Griffin International, Inc. (Griffin) for Mr. Charlie Wells of Charlie's Mobil, to address petroleum contamination detected during the July 1998 permanent closure of three gasoline underground storage tanks (USTs). Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) requested that this work be completed in a letter to Mr. Charlie Wells of Charlie's Mobil dated September 22, 1998. The site (VTDEC Site #98-2470) is owned by Charlie Wells of Bennington, VT.

Work conducted at the site included the installation of three groundwater monitoring wells and the collection and laboratory analysis of groundwater samples from these monitoring wells, as well as from one existing on-site monitoring well. In addition, a sensitive receptor risk assessment was conducted to assess the risk that subsurface contamination at the site may pose to potentially sensitive receptors identified in the site vicinity. Work has been conducted in accordance with Griffin's *Work Plan and Cost Estimate for a Subsurface Investigation at Charlie's Mobil* dated December 28, 1998. The Work Plan was approved by Ms. Linda Elliott of the VTDEC in a letter to Griffin dated January 13, 1999.

II. SITE BACKGROUND

A. Site History

Subsurface petroleum contamination was detected in soils at Charlie's Mobil during the closure of (1) 10,000-gallon gasoline, (1) 8,000-gallon gasoline, and (1) 6,000-gallon gasoline USTs on July 13, 1998. The tanks were removed and replaced with (1) 10,000-gallon and (1) 8,000-gallon gasoline USTs. Details of the closure inspection are outlined in the Underground Storage Tank Permanent Closure Form, which was submitted to the VTDEC on July 21, 1998 by Griffin International [1]. Adsorbed petroleum contamination at concentrations between 3 and 350 parts per million (ppm) was detected in the vicinity of the three gasoline USTs, as measured with a photoionization detector (PID). A sheen was observed on groundwater encountered during the excavation.

During tank replacement activities in July 1998 approximately 185 cubic yards of soil could not be returned to the UST pit, and were stockpiled on-site. Griffin is currently coordinating the removal of these stockpiled soils. A work plan and cost estimate for these efforts will be sent to the VTDEC under separate cover.

In compliance with a request from the VTDEC that additional work be conducted at this site in order to determine the degree and extent of subsurface contamination, Mr. Charlie Wells retained the services of Griffin to conduct this initial site investigation.

B. Site Description

Charlie's Mobil is located at 216 Northside Drive in Bennington, VT (see Site Location Map in Appendix A). The area consists of commercial properties. The subject property is bordered by Northside Drive to the northeast, a strip mall to the southwest, the entrance drive to the strip mall to the southeast, and a Best Western Motel to the northwest.

There is one building on the subject property. It is currently occupied by a gas station and a sports shop. The majority of the site is paved or occupied by the building.

Water for the station and store is supplied by a privately owned, on-site bedrock well. Well construction details were not available from the VTDEC Water Supply Division. The approximate location of the supply well is shown on the Site Map in Appendix A. Water for surrounding residences and businesses is supplied by the City of Bennington [1].

C. Site Geologic Setting

According to the Surficial Geologic Map of Vermont [2], the site is underlain by outwash; horizontally bedded glaciofluvial gravel. Soils encountered during monitoring well installation consisted primarily of poorly graded gravel with sand, overlying boulders with sand. Bedrock at the site is mapped as Winooski dolomite [3]; however bedrock was not encountered during this initial site investigation.

Based on visual observation and review of the USGS topographic map [4], groundwater in the vicinity of Charlie's Mobil would be expected to flow to the south toward the Roaring Branch of the Walloomsac River, following topographic contours.

III. INVESTIGATIVE PROCEDURES

A. Monitoring Well Installation

On February 23, 1999 three shallow monitoring wells were installed by Technical Drilling Services of Leominster, Massachusetts, using a hollow stem auger. Drilling and well construction were directly supervised by a Griffin engineer. Soil samples were collected at five-foot intervals from each boring. Each soil sample was screened for volatile organic compounds (VOCs) using a HNu Model HW-101 photoionization detector (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 the Well Logs in Appendix B).

The monitoring wells (MW-1, MW-2, and MW-3) were installed to help better define groundwater flow direction and gradient and the degree and extent of suspected petroleum contamination at the site. MW-1 was placed in a presumed down to crossgradient direction from the UST system. MW-2 was installed in a presumed up to cross-gradient direction from the UST system and associated piping. MW-3 was installed in a presumed upgradient direction of the UST system. An existing monitoring well, MW-4 was located in the vicinity of the UST system, in a presumed downgradient direction.

The monitoring wells were constructed of 2.0-inch diameter Schedule 40 PVC riser and 0.010-inch factory slotted, well screen. The length of the riser and the screened section of pipe varied depending on the depth of the well. The annulus between the well screen and the borehole was filled with a sand pack to 1-foot above the well screen. A bentonite seal was placed above the sand pack. To complete the construction of each well, a road box was set in concrete at grade level. In addition, locking well caps were placed on the monitoring wells. Specific well construction details are displayed in the detailed well logs included in Appendix B.

MW-1

The boring for MW-1 was advanced to 15 feet below grade. Soils from the boring from MW-1 consisted of fill material from 0 to 2 feet below grade. Dry, light brown, poorly graded sand with gravel and cobbles was observed between 5 and 7 feet below grade. Wet, light brown, well graded sand with gravel and cobbles was observed between 10 and 12 feet below grade and between 13 and 15 feet below grade. Petroleum odors were observed in the soils from this boring. Soil samples collected for PID screening contained VOC concentrations between 1.2 and 38 parts per million (ppm). The maximum PID reading was measured between 10 and 12 feet below grade, approximately coincident with the water table elevation.

Groundwater was encountered at approximately 9 feet below grade. The screened section of the well was installed to 15 feet below the ground surface.

MW-2

The boring for MW-2 was advanced to 15 feet below grade. Soils from the boring consisted of fill material from 0 to 2 feet below grade. Dry, light brown, well graded sand with gravel was observed between 5 and 7 feet below grade. Soils between 10 and 12 feet below grade consisted of wet, light brown, well graded sand with gravel. Wet, light brown, well graded sand with gravel was observed between 13 and 15 feet below grade. Petroleum odors were not observed in the soils from this boring. Soil samples collected for PID screening contained VOC concentrations between 1.2 and 3.2 ppm.

Groundwater was encountered at approximately 9 feet below grade. The screened section of the well was installed to 15 feet below the ground surface.

MW-3

The boring for MW-3 was advanced to 15 feet below grade. Soils from the boring consisted of fill material between 0 and 2 feet below grade. Moist, olive gray, silt with medium sand was observed from 5 to 7 feet below grade. Soils from 10 to 12 feet below grade consisted of moist, light brown, well graded sand with gravel. Soils between 13 and 15 feet below grade consisted of wet, light brown, well graded sand with gravel. Petroleum odors were observed in the soils collected between 5 and 7 feet below grade. Soil samples collected for PID screening contained VOC concentrations between 1 and 16 ppm. The maximum reading was measured in soils collected between 5 and 7 feet below grade, in the vadose zone soils above the water table.

Groundwater was encountered at approximately 9 feet below grade. The screened section of the well was installed to 15 feet below the ground surface.

B. Determination of Groundwater Flow Direction and Gradient

Water table elevation measurements were collected from all monitoring wells on March 5, 1999 using a Keck™ interface probe. These measurements were subtracted from the top of casing elevations, which were determined relative to an arbitrary datum of 100 feet at grade at MW-1, to determine the water table elevation at each of the wells. Groundwater level data are recorded in Appendix C. No free phase petroleum product was observed in any of the monitoring wells gauged on March 5, 1999.

As displayed in the groundwater contour map included in Appendix A, the groundwater flow direction for March 5, 1999 was estimated to be to the southwest at a hydraulic gradient of approximately 0.5%. Under this groundwater flow regime, MW-1 is located down and crossgradient of the source area (i.e., the former UST system), and the existing monitoring well, MW-4 is located downgradient of the source area. MW-2 and MW-3 are located upgradient of the source area.

C. Groundwater Sample Collection and Analysis

Groundwater samples were collected from each monitoring well immediately following well gauging on March 5, 1999. Samples were analyzed for the presence of VOCs per EPA Method 8021B.

None of the compounds targeted by the method of analysis were detected at levels above their respective Vermont Groundwater Enforcement Standards, in the groundwater samples collected on March 5, 1999. Results of the laboratory analyses are summarized in Appendix D. Laboratory report forms are presented in Appendix E.

All samples were collected according to Griffin's groundwater sampling protocol, which complies with industry and state standards. Results from the analyses of the trip blank and duplicate sample indicate that adequate quality assurance and control (QA/QC) were maintained during sample collection and analysis.

D. Supply Well Sample Collection and Analysis

A supply well sample was collected from the sink in the store room of the on-site building on March 26, 1999. The sample was analyzed for the presence of VOCs per EPA Method 8021B. None of the compounds targeted by this analysis were detected in the supply well sample collected on March 26, 1999. Results of the laboratory analyses are summarized in Appendix D. Laboratory report forms are presented in Appendix E.

E. Sensitive Receptor Risk Assessment

A receptor risk assessment was conducted to identify known and potential receptors of the contamination detected at Charlie's Mobil. A visual survey was conducted during monitoring well installation. Based on these observations, a determination of the potential risk to identified receptors was conducted based on proximity to the expected source area (i.e., former gasoline UST systems), groundwater flow direction, and contaminant concentration levels in groundwater.

Water Supplies

The buildings in the area are supplied by town water. Charlie's Mobil is serviced by an on-site bedrock supply well. The supply well is located crossgradient of the source area with respect to the overburden aquifer, based on March 5, 1999 water table elevation measurements. A supply well sample collected on March 26, 1999 did not contain detectable concentrations of targeted compounds.

Buildings in the Vicinity

Charlie's Mobil is the only building located on the subject property. The building is down and cross gradient of the source area, but is constructed on a slab, which would tend to minimize potential risk of vapor impact to the building.

Properties in the vicinity of Charlie's Mobil are primarily commercial. The strip mall located to the southwest of the subject site is downgradient of the source area. Given that concentrations of petroleum constituents detected in groundwater at Charlie's Mobil were below enforceable standards, and considering that the area is serviced by municipal, the risk of petroleum impact to the downgradient property is considered minimal.

Surface Water

The nearest surface waters to the site are Furnace Brook, located approximately 750 feet north of the subject property, and the Roaring Branch of the Walloomsac River, which is approximately 1500 feet south of the site. Based on the estimated direction of groundwater flow (March 5, 1999), Furnace Brook is up-gradient of the source area, and is therefore considered at minimal risk of petroleum impact. The Roaring Branch is located downgradient of the source area. Given that concentrations of petroleum constituents detected in groundwater at Charlie's Mobil were below enforceable standards, and given its sufficient distance from the subject property, the Roaring Branch of the Walloomsac River is not considered to be at significant risk of petroleum contamination from the Charlie's Mobil site.

IV. CONCLUSIONS

Based on the initial site investigation of petroleum contamination at Charlie's Mobil, the following conclusions are offered:

1. There has been an apparent release of petroleum at the subject site, although limited in degree and extent.
2. Three shallow monitoring wells were installed in the site vicinity on February 23, 1999. These wells, in addition to an existing on-site monitoring well, were utilized to evaluate the degree and extent of subsurface contamination encountered during the closure of (1) 10,000-gallon gasoline, (1) 8,000-gallon gasoline, and (1) 6,000-gallon gasoline USTs on July 13, 1998. These tanks were removed and replaced with (1) 10,000-gallon and (1) 8,000-gallon gasoline USTs.
3. Water table elevation data collected on March 5, 1999, indicate that groundwater in the overburden aquifer beneath the site flows in a southwesterly direction toward the Roaring Branch of the Walloomsac River at a hydraulic gradient of approximately 0.5%.
4. VOC readings of soils collected during monitoring well installation on February 23, 1999 indicate that adsorbed petroleum compounds are present in the soils at Charlie's Mobil. VOC concentrations ranged from 0 to 38 ppm, the highest levels were observed in the down and crossgradient soil borings, at depths of 5 to 12 feet below grade. With the source USTs removed, it is expected that adsorbed petroleum compound concentrations will decrease over time with the progressive action of natural mitigative processes including biodegradation, volatilization, and diffusion.
5. Very low levels of dissolved petroleum contamination were detected in groundwater samples collected from the on-site monitoring wells MW-2 and MW-4 on March 5, 1999. The detected concentrations in monitoring wells MW-2 and MW-4 were below the VGES.

No petroleum contamination was detected in the groundwater samples collected from MW-3, and the furthest downgradient well, MW-1. These results indicate that the downgradient extent of dissolved contamination relative to the former USTs system has been defined, and is limited to the vicinity of the former USTs, well within the property boundary.

6. All buildings in the site vicinity are serviced by the municipal water. The subject property is serviced by an on-site bedrock supply well. Based on the low level of dissolved petroleum contamination detected at the site, it does not appear likely that water supplies in the vicinity of Charlie's Mobil are at significant risk of petroleum contamination from the site.
7. The petroleum contamination source area location on the Charlie's Mobil site is covered with a concrete pad surrounded by asphalt pavement, and is not readily accessible. The on-site building is located approximately 15 feet northwest of the area of detected contamination. The building is constructed upon a slab foundation. Given the low source area strength, the potential impact to the indoor air of the building from migration of VOCs from soils and groundwater through the concrete slab foundation is considered minimal.
8. No receptors in the vicinity of the site have been identified as being at significant risk of impact from petroleum contamination at the subject property.

V. RECOMMENDATION

Based on the results of this site investigation, and pending removal of the on-site soil stockpile, Griffin recommends that Charlie's Mobil in Bennington, Vermont site be removed from the VTDEC Active Hazardous Waste Sites List. This recommendation is offered based upon achievement of the following closure criteria, as per the VTDEC Site Management Activity Completed (SMAC) Checklist (dated December 1, 1997):

- 1) The source(s), nature, and extent of the petroleum contamination at the site have been adequately defined.

See Conclusions #1, #2, and #4.

- 2) Source(s) has been removed, remediated, or adequately contained.

See Conclusions #1 and #4.

- 3) Levels of contaminants in soil and groundwater shall be stable, falling, or non-detectable.

See Conclusion #2 and #4.

- 4) Groundwater enforcement standards are met at the following compliance points:

Any point of present use of groundwater as a source of potable water: See Conclusions #4 and #5

Any point at or within the boundary of any Class I groundwater area: The Charlie's Mobil site is not within a Class I groundwater area.

Any point at the boundary of the property on which the contaminant source is located: See Conclusion #4.

- 5) Soil guideline levels are met. If not, engineering or institutional controls are in place.

See Conclusion #6.

- 6) No unacceptable threat to human health or the environment exists on site.

See Conclusions #4, #5, #6, and #7.

- 7) Site meets RCRA requirements.

Available records indicate that Charlie's Mobil is not in violation of the Resource Conservation and Recovery Act (RCRA) as defined in 40 CFR 264.

- 8) Site meets CERCLA requirements.

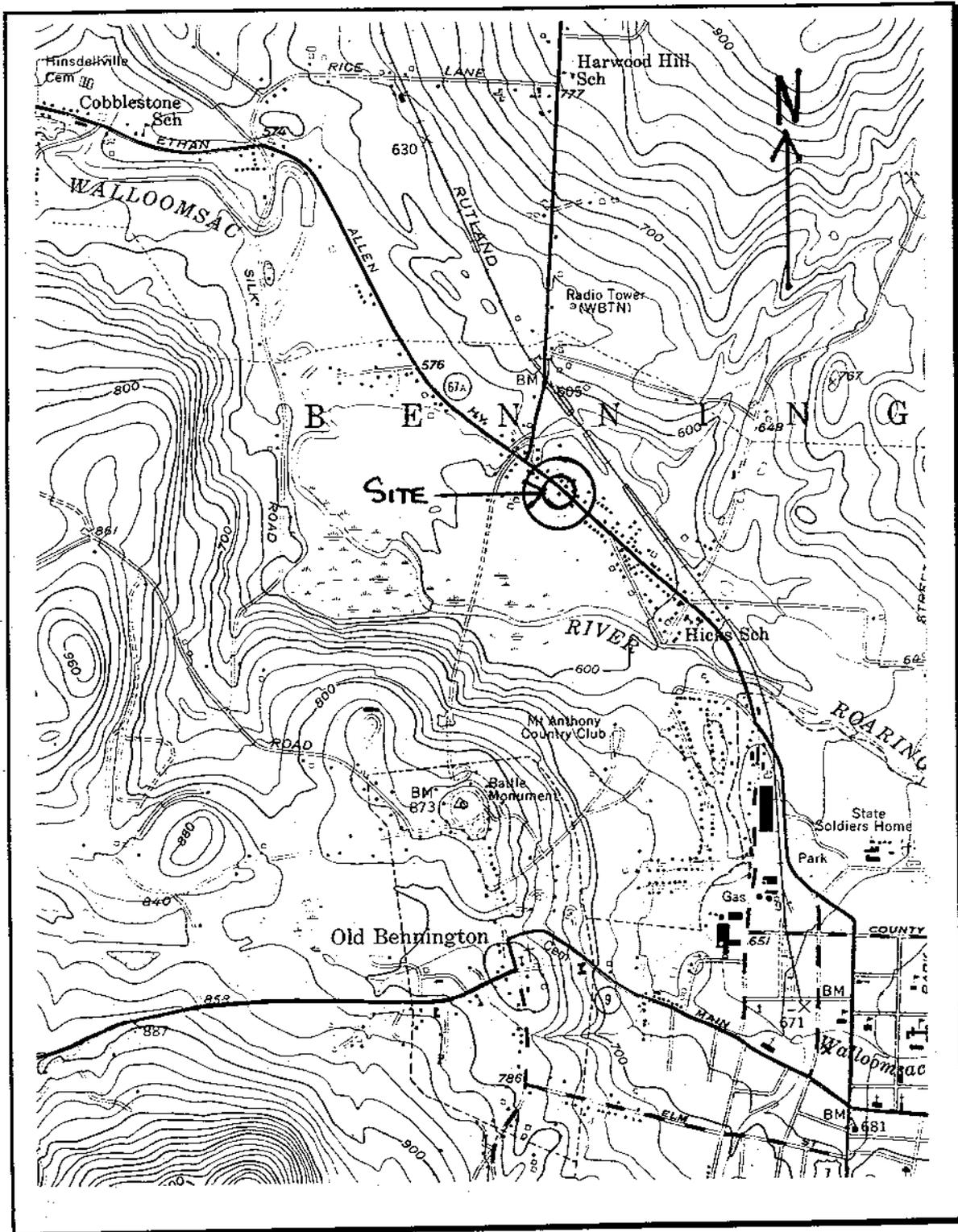
Available records indicate that Charlie's Mobil is not in violation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as defined in 40 CFR 300.

VI. REFERENCES

1. Griffin International Inc., July 21, 1998. UST Closure Letter Report from Willis Doe to Susan Thayer (VTDEC) re: Charlie Wells Sport Shop/Gas Station UST System Closure Inspection, UST Facility 1106.
2. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, State of Vermont.
3. Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, State of Vermont.
4. USGS 7.5 Minute Topographic Quadrangle Map. 1954. Bennington, Vermont.

APPENDIX A

Maps



SITE LOCATION MAP
Charlie's Mobil, Riverside Drive, Bennington, Vermont

Source: Bennington, Vermont, USGS 7.5-minute Topographic Quadrangle, 1954.

NORTHSIDE DRIVE/ROUTE 67A



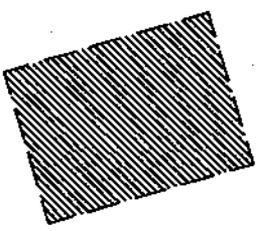
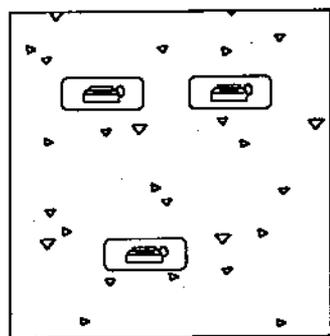
WALMART ENTRANCE



MW3

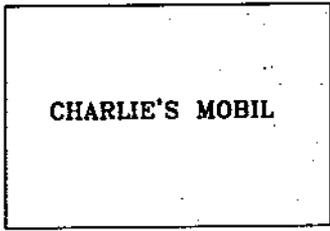
MW2

APPROX. LOCATION OF BEDROCK SUPPLY WELL

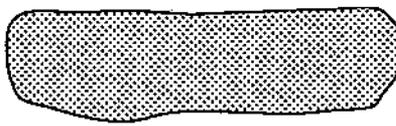


FORMER LOCATION OF (1) 10,000, (1) (8,000) AND (1) 8,000 GALLON GASOLINE UST's REPLACED WITH (1) 10,000 AND (1) 8,000 GALLON GASOLINE UST's.

MW4



MW1



SOIL STOCKPILE

LEGEND



MONITORING WELL

JOB #: 19941462



CHARLIE'S MOBIL

BENNINGTON, VERMONT

SITE MAP

DATE: 3/25/99

DWG.#:2

SCALE: 1"=30'

DRN.:SB

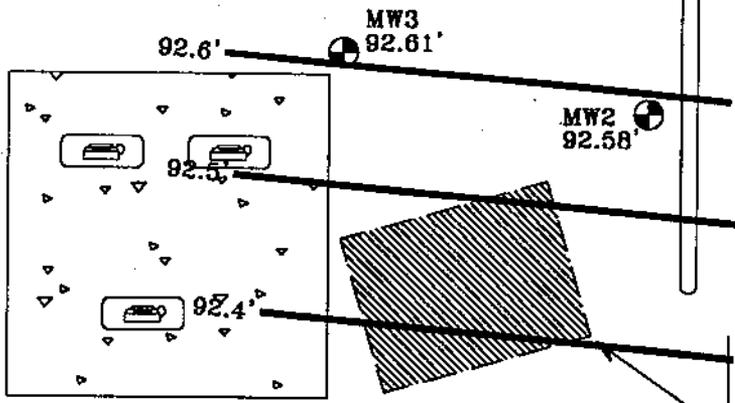
APP.:BS

NORTHSIDE DRIVE/ROUTE 67A



WALMART ENTRANCE

APPROX. LOCATION OF BEDROCK SUPPLY WELL



FORMER LOCATION OF (1) 10,000, (1) (8,000) AND (1) 8,000 GALLON GASOLINE UST's REPLACED WITH (1) 10,000 AND (1) 8,000 GALLON GASOLINE UST's.

CHARLIE'S MOBIL

APPROX. DIRECTION OF GROUNDWATER FLOW

SOIL STOCKPILE

LEGEND

- MW2 92.58' MONITORING WELL AND WATER TABLE ELEVATION IN FEET
- 92.4' GROUNDWATER CONTOUR IN FEET (DASHED WHERE INFERRED)



JOB #: 19941462

CHARLIE'S MOBIL

BENNINGTON, VERMONT

GROUNDWATER CONTOUR MAP
MEASUREMENT DATE: 3/5/99

DATE: 3/25/99	DWG.#:3	SCALE: 1"=30'	DRN.:SB	APP.:BS
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NORTHSIDE DRIVE/ROUTE 67A



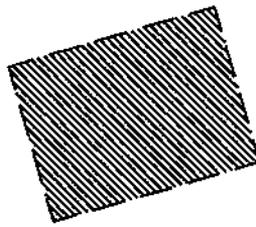
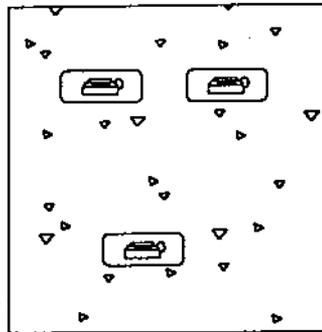
WALMART
ENTRANCE



MW3
ND

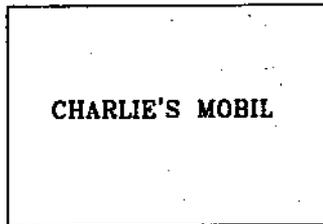
MW2
2.2

APPROX. LOCATION
OF BEDROCK
SUPPLY WELL



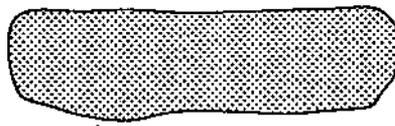
FORMER LOCATION OF
(1) 10,000, (1) (8,000)
AND (1) 8,000 GALLON
GASOLINE UST's REPLACED
WITH (1) 10,000 AND (1)
8,000 GALLON GASOLINE
UST's.

MW4
25.1



CHARLIE'S MOBIL

MW1
ND



SOIL STOCKPILE

LEGEND

● 2.2 MONITORING WELL AND TOTAL
TARGETED VOC CONCENTRATION (ppb)

ND NONE DETECTED

JOB #: 18941462



CHARLIE'S MOBIL

BENNINGTON, VERMONT

CONTAMINANT CONCENTRATION MAP
SAMPLE DATE: 3/5/99

DATE: 3/25/99

DWG.#:4

SCALE: 1"=30'

DRN.:SB

APP.:BS

APPENDIX B

Well Logs

PROJECT CHARLIES MOBIL

LOCATION BENNINGTON, VERMONT

DATE DRILLED 2/23/99 TOTAL DEPTH OF HOLE 15.0'

DIAMETER 4.25"

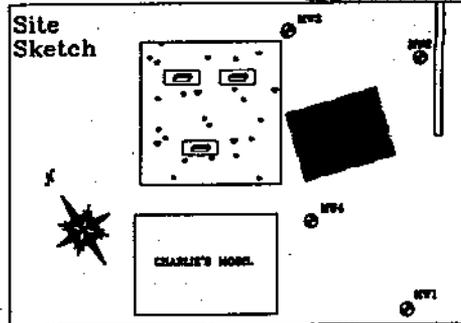
SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"

CASING DIA. 2" LENGTH 4.66' TYPE sch 40 pvc

DRILLING CO. TDS DRILLING METHOD HSA

DRILLER STEVE BLISS LOG BY B. STOPFORD

WELL NUMBER MW1

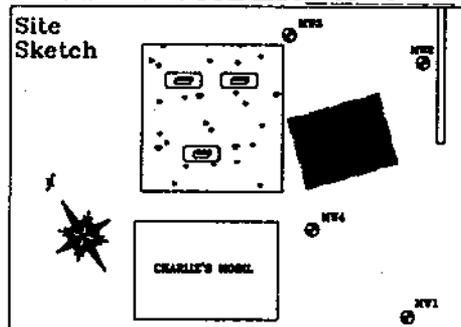


GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0	ROAD BOX LOCKING WELL CAP				0
1	CONCRETE				1
2	NATIVE BACKFILL				2
3	BENTONITE				3
4	WELL RISER				4
5			5'-7'	POORLY GRADED SAND WITH GRAVEL AND COBBLES (SP)- 95% medium sand, 5% fine gravel, poorly graded, dry, light brown.	5
6			3.5 ppm		6
7	SAND PACK				7
8					8
9				9.0' WATER TABLE	9
10	WELL SCREEN		10'-12'	WELL GRADED SAND WITH GRAVEL AND COBBLES (SW)- 80% coarse sand, 10% coarse gravel, well graded, loose, wet, light brown.	10
11			28/32/27/35 38 ppm		11
12					12
13					13
14	BOTTOM CAP		13'-15'	WELL GRADED SAND WITH GRAVEL AND COBBLES (SW)- 90% coarse sand, 10% fine gravel, well graded, loose, wet, light brown.	14
15	UNDISTURBED NATIVE SOIL		1.2 ppm	BASE OF WELL AT 15' END OF EXPLORATION AT 15'	15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT CHARLES MOBIL
 LOCATION BENNINGTON, VERMONT
 DATE DRILLED 2/23/99 TOTAL DEPTH OF HOLE 15.0'
 DIAMETER 4.25"
 SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"
 CASING DIA. 2" LENGTH 4.625" TYPE sch 40 pvc
 DRILLING CO. TDS DRILLING METHOD HSA
 DRILLER STEVE BLISS LOG BY B. STOPFORD

WELL NUMBER MW2



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0	ROAD BOX	LOCKING WELL CAP			0
1	CONCRETE				1
2	NATIVE BACKFILL				2
3	BENTONITE				3
4	WELL RISER				4
5			5'-7' 28/120/120	WELL GRADED SAND WITH GRAVEL (SW)- 85% medium sand, 15% fine gravel, well graded, loose, dry, light brown.	5
6			3.2 ppm		6
7	SAND PACK				7
8					8
9				9.0' WATER TABLE	9
10	WELL SCREEN		10'-12' 30/36/120/36	MEDIUM SAND WITH GRAVEL (SW)- 90% medium sand, 10% fine gravel, well graded, loose, wet, light brown.	10
11			1.4 ppm		11
12					12
13					13
14	BOTTOM CAP		13'-15' 38/41/120/2	WELL GRADED SAND WITH GRAVEL (SW)- 85% medium, subrounded sand, 15% fine, subrounded gravel, well graded, loose, wet, light brown.	14
15	UNDISTURBED NATIVE SOIL		1.2 ppm		15
16				BASE OF WELL AT 15' END OF EXPLORATION AT 15'	16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT CHARLIES MOBIL

LOCATION BENNINGTON, VERMONT

DATE DRILLED 2/23/99 TOTAL DEPTH OF HOLE 17.0'

DIAMETER 4.25"

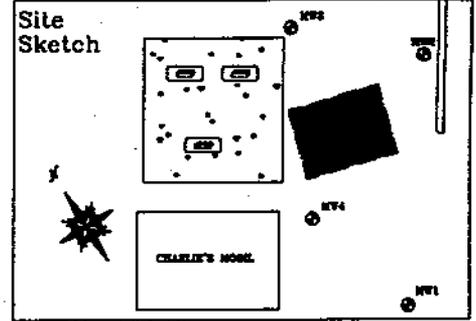
SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"

CASING DIA. 2" LENGTH 4.125" TYPE sch 40 pvc

DRILLING CO. TDS DRILLING METHOD HSA

DRILLER STEVE BLISS LOG BY B. STOPFORD

WELL NUMBER MW3



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0	ROAD BOX				0
0	LOCKING WELL CAP				0
0	CONCRETE				0
1	NATIVE BACKFILL				1
2	BENTONITE				2
3	WELL RISER				3
4	WELL RISER				4
5	WELL RISER				5
5-7	WELL RISER		14/16/14/17 16 ppm	SILT WITH MEDIUM SAND (ML)- 80% silt, 20% medium sand, medium dense, moist, olive gray.	6
7	SAND PACK				7
8	SAND PACK				8
9	SAND PACK			9.0' WATER TABLE	9
10	WELL SCREEN		10'-12' 120/120/120/120 3 ppm	WELL GRADED SAND WITH GRAVEL (SW)- 5% silt, 90% fine sand, 5% gravel, well graded, dense, moist, light brown.	10
11	WELL SCREEN				11
12	WELL SCREEN				12
13	WELL SCREEN				13
13-15	WELL SCREEN		13'-15' 1 ppm	WELL GRADED SAND WITH GRAVEL (SW)- 5% silt, 90% medium sand, 5% fine gravel, well graded, loose, wet, light brown.	14
14	BOTTOM CAP				14
15	BOTTOM CAP				15
15	BOTTOM CAP			BASE OF WELL AT 15' END OF EXPLORATION AT 15'	15
16	BOTTOM CAP				16
17	UNDISTURBED NATIVE SOIL				17
18	UNDISTURBED NATIVE SOIL				18
19	UNDISTURBED NATIVE SOIL				19
20	UNDISTURBED NATIVE SOIL				20
21	UNDISTURBED NATIVE SOIL				21
22	UNDISTURBED NATIVE SOIL				22
23	UNDISTURBED NATIVE SOIL				23
24	UNDISTURBED NATIVE SOIL				24
25	UNDISTURBED NATIVE SOIL				25

APPENDIX C

Liquid Level Monitoring Data

Charlie's Mobil
216 Northside Drive
Bennington, VT

Table 1. Summary of Liquid Level Data
Sample Date: 3/5/99

Well I.D.	Well Depth btoc	Top of Casing Elevation	Depth To Product btoc	Depth To Water btoc	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW1	-	98.35	-	6.14	-	-	-	-	92.21
MW2	-	98.67	-	6.09	-	-	-	-	92.58
MW3	-	99.63	-	7.02	-	-	-	-	92.61
EMW4	-	99.59	-	7.30	-	-	-	-	92.29

All Values Reported in Feet

btoc - Below Top of Casing

Elevations determined relative to grade level at MW1, which was arbitrarily set at 100'

nm - not measured

Site surveyed by Griffin International, February 23, 1999

APPENDIX D

Groundwater Quality Summary Reports

Charlie's Mobil
 216 Northside Drive
 Bennington, VT

Table 2. Groundwater Quality Summary
Sample Date: 3/5/99

PARAMETER	MW1	MW2	MW3	MW4	Supply Well	VGES
Benzene	ND(1)	ND(1)	ND(1)	3.3	ND(1)	5
Toluene	ND(1)	ND(1)	ND(1)	1.5	ND(1)	1,000
Ethylbenzene	ND(1)	ND(1)	ND(1)	2.2	ND(1)	700
Xylenes	ND(1)	2.2	ND(1)	2.4	ND(1)	10,000
Total BTEX	ND	2.2	ND	9.4	ND	-
1,3,5 Trimethyl Benzene	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	4
1,2,4 Trimethyl Benzene	ND(1)	TBQ(1)	ND(1)	2.2	ND(1)	5
Napthalene	ND(1)	ND(1)	ND(1)	2.0	ND(1)	20
MTBE	ND(10)	TBQ(10)	ND(10)	11.5	ND(10)	40
Total Targeted VOCs	ND	2.2	ND	25.1	ND	-

TBQ(): Trace below quantitation limit (quantitation limit)

ND(): Not detected (detection limit)

All values in ug/L (ppb) unless noted

Analysis by EPA Method 8021B

VGES = Vermont Groundwater Enforcement Standards (Vermont Groundwater Protection Rule and Strategy, 11/15/97)

Charlie's Mobil
216 Northside Drive
Bennington, VT

Table 3. Quality Assurance and Control Samples
Sample Date: March 5, 1999

PARAMETER	Trip Blank	Duplicate (MW-1)	VGES
Benzene	ND(1)	ND(1)	5
Toluene	ND(1)	ND(1)	1,000
Ethylbenzene	ND(1)	ND(1)	700
Xylenes	ND(1)	ND(1)	10,000
Total BTEX	ND	ND	
1,3,5 Trimethyl Benzene	ND(1)	ND(1)	4
1,2,4 Trimethyl Benzene	ND(1)	ND(1)	5
Napthalene	ND(1)	ND(1)	20
MTBE	ND(10)	ND(10)	40
Total Targeted VOCs	ND	ND	

Analysis by EPA Method 8021B

All Values Reported in ug/l (ppb)

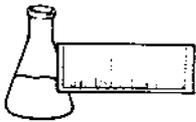
ND() = None detected (detection limit)

TBQ() = Trace below quantitation (detection limit)

VGES = Vermont Groundwater Enforcement Standards (Vermont Groundwater Protection Rule and Strategy, 11/15/97)

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

ORDER ID: 1533

PROJECT NAME: Charlies Mobil/#19941462

REF.#: 135,308 - 135,313

REPORT DATE: March 10, 1999

DATE SAMPLED: March 5, 1999

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.

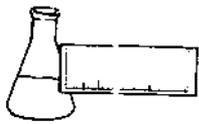
Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

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 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International

DATE RECEIVED: March 8, 1999

PROJECT NAME: Charlies Mobil/#19941462

REPORT DATE: March 10, 1999

CLIENT PROJ. #: 19941462

ORDER ID: 1533

Ref. #:	135,308	135,309	135,310	135,311	135,312
Site:	Trip Blank	MW #2	MW #3	MW #4	MW #1
Date Sampled:	3/5/99	3/5/99	3/5/99	3/5/99	3/5/99
Time Sampled:	7:04	11:17	11:37	12:00	12:17
Sampler:	D. Tourangeau				
Date Analyzed:	3/9/99	3/10/99	3/9/99	3/10/99	3/9/99
UIP Count:	0	0	0	>10	0
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	90	93	105	86	93
Parameter	Conc. (ug/L)				
MIBE	<10	TBQ <10	<10	11.5	<10
Benzene	<1	<1	<1	3.3	<1
Toluene	<1	<1	<1	1.5	<1
Ethylbenzene	<1	<1	<1	2.2	<1
Xylenes	<1	2.2	<1	2.4	<1
1,3,5 Trimethyl Benzene	<1	<1	<1	<1	<1
1,2,4 Trimethyl Benzene	<1	TBQ <1	<1	2.2	<1
Naphthalene	<1	<1	<1	2.0	<1

Ref. #:	135,313				
Site:	Duplicate				
Date Sampled:	3/5/99				
Time Sampled:	12:17				
Sampler:	D. Tourangeau				
Date Analyzed:	3/10/99				
UIP Count:	0				
Dil. Factor (%):	100				
Surr % Rec. (%):	91				
Parameter	Conc. (ug/L)				
MIBE	<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

19941462

CHAIN-OF-CUSTODY RECORD

13242

1-DR6

Project Name: <i>CHARLES MOBIC</i>	Reporting Address: <i>GRIFIN</i>	Billing Address: <i>GRIFIN</i>
Site Location: <i>BENNINGTON</i>	Company: <i>GRIFIN</i>	Sampler Name: <i>DON TOURANGEAU</i>
Endyne Project Number: <i>1533</i>	Contact Name/Phone #: <i>BETH STOPPARD</i>	Phone #: <i>DON TOURANGEAU</i>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
135308	TRIP BLANK	H ₂ O	X		07:04	2	40ml		80213	HCL	
135309	1111 ^{#2}				11:17						
135310	1111 ^{#3}				11:37						
135311	1111 ^{#4}				12:00						
135312	1111 ^{#1}				12:17						
135313	DUPLICATE				12:17						

Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time <i>3-8-99 10:40</i>
Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time <i>3-8-99 10:40am</i>

 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	Nitric 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
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(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International

ORDER ID: 1739

PROJECT NAME: Charlies Mobil/#19941462

REF.#: 135,966

REPORT DATE: April 6, 1999

DATE SAMPLED: March 26, 1999

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.

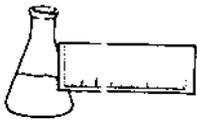
Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.

Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

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(802) 879-4333
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Griffin International

DATE RECEIVED: March 29, 1999

PROJECT NAME: Charlies Mobil/#19941462

REPORT DATE: April 6, 1999

CLIENT PROJ. #: 19941462

ORDER ID: 1739

Ref. #:	135,966				
Site:	Supply Well				
Date Sampled:	3/26/99				
Time Sampled:	6:08				
Sampler:	W.J.D.				
Date Analyzed:	4/5/99				
UIP Count:	0				
Dil. Factor (%):	100				
Surr % Rec. (%):	96				
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

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

19941462

CHAIN-OF-CUSTODY RECORD

1-019

Project Name: CHARLES MOELL Site Location: BENNINGTON	Reporting Address: GRIFFIN WTL	Billing Address: GRIFFIN
Endyne Project Number: 1739	Company: GRIFFIN Contact Name/Phone #: PH 14 STYMOND	Sampler Name: WTD Phone #: 865-4228

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				
1359166	SUPPLY WELL	DR H2O	✓		3/26/99 1908	3	VIA		8021B	HC/ICE	

Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time 3.29.99 11:09
Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time 3/29/99 10:09

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):										