ENVIRONMENTAL COMPLIANCE SERVICES, INC.

December 1, 1998
Project #40062.10
Document: Summary.rpt

Mr. Chuck Schwer, Supervisor
Sites Management Section
VT DEC WMD
103 South Main Street/West Office
Waterbury, VT 05671-0404

RE: Site Investigation Report
Marlboro College, Presser Music Building, Marlboro, VT
DEC Site #98-2401

Dear Mr. Schwer:

Enclosed please find the above referenced report for your review. Should you have any questions regarding this information, please feel free to call me at 802-257-1195.

Sincerely,
ENVIRONMENTAL COMPLIANCE SERVICES, Inc.

David C. Balk

David C. Balk, P.G.
Project Manager

DCB

enclosure

cc: Hendrick W. van Loon, Marlboro College

588 Silver Street • Agawam, MA 01001 • 413-789-3530 • Fax 413-789-2776
157 Old Guilford Road #6 • Brattleboro, VT 05301 • 802-257-1195 • Fax 802-257-1603

Phase	Type
X Initial Site Investigation ☐ Corrective Action Feasibility Investigation ☐ Corrective Action Plan ☐ Corrective Action Summary Report ☐ Operations and Monitoring Report	☐ Work Scope **X Technical Report** ☐ PCF Reimbursement Request ☐ General Correspondence

Site Investigation Report
Marlboro College
Presser Music Building
Marlboro, Vermont
SMS Site #98-2401

Prepared for:

Marlboro College
Marlboro, Vermont 05344
Contact: Hendrick W. van Loon
Phone: (802) 257-4333

Prepared by:

Environmental Compliance Services, Inc.
157 Old Guilford Road #6
Brattleboro, VT 05301
Contact: David C. Balk, P.G.
Phone: (802) 257-1195

December 1, 1998

Site Investigation Report
Presser Music Building, Marlboro College
Site #98-2401

Table of Contents

Appendices

1.0 Introduction

On September 22, 1997 a 1,000 gallon #2 fuel oil underground storage tank (UST) was removed from outside Presser Music Building at Marlboro College ("the site;" see locus map, Appendix A). Soils from the tank excavation were screened with a Photovac Model 2020 photoionization detector (PID) for the presence of Volatile Organic Compound (VOC) concentrations. The levels of contamination ranged from 0 to 57 parts per million (ppm). A tank closure report was submitted to the VT DEC, and resulted in the request for subsurface investigations to assess the extent and degree of petroleum contamination in soil and/or groundwater at the site.

Environmental Compliance Services, Inc. of Brattleboro, VT submitted a work plan for these additional investigations to the VT DEC on behalf of Hendrick W. van Loon of Marlboro College. The work plan included soil boring advancement, groundwater monitoring well installation, groundwater sampling and analysis, and a sensitive receptor survey. It was approved by the Sites Management Section (SMS) on July 21, 1998.

This report documents the work performed by ECS at the site and presents results, conclusions and recommendations.

2.0 Site Description

The subject property exists at an elevation of approximately 1,710 feet above mean sea level. The Marlboro College campus is composed of over twenty five buildings, approximately one quarter of which serve as dormitories. The site is surrounded by undeveloped land. To the north of the Presser Music Building is the college campus; the land slopes upward in this direction. To the south is the Perrine building which is located approximately 130 feet downgradient of the fuel oil UST grave. Drinking water is supplied to the campus by a well located topographically upgradient approximately one half mile away.

Observations made during the removal of the fuel oil UST in September 1997 indicate that the soils in the tank pit were brown, coarse sand and gravel to 8 feet below ground surface (bgs) at which point bedrock was encountered. Groundwater was encountered at approximately seven feet bgs. A 1,000 gallon #2 fuel oil double walled UST was installed in the tank grave.

3.0 Work Performed

3.1 Monitoring Well and Soil Borings

Using a hollow stem auger drill rig, ECS installed three monitoring wells, designated ECS-1, ECS-2, and ECS-3, and drilled two soil borings downgradient of the tank grave on August 18, 1998. Monitoring well and soil boring locations are shown on the site plan in Appendix B. The wells were constructed of 2 inch diameter schedule 40 PVC slotted screen (size 10) with flush mounted road boxes. Split spoon samples were screened for VOCs with a Photovac Model 2020 Photoionization Detector (PID), using bag headspace protocol. No VOCs were detected during

drilling of the three monitoring wells and the two downgradient soil borings. No monitoring wells were installed in two of the downgradient soil borings due to the lack of a perceptible water table in the split spoon samples. Soil boring ECS-4 was advanced to refusal at the depth of 8 feet below grade. The soils consisted of a compact glacial till deposited on bedrock. Soil boring/monitoring well construction logs are presented in Appendix C.

3.2 Groundwater Table and Flow Direction

Monitoring well ECS-1 installed east of the tank grave contained sufficient water for sampling. However, no groundwater was evident in the downgradient monitoring wells ECS-2 and ECS-3. General topography and soil types indicate groundwater flow at the site is to the south/southeast.

3.3 Groundwater Sampling and Analysis

Groundwater from monitoring well ECS-1 was sampled on August 26, 1998, by ECS personnel using a disposable plastic bailer. A duplicate groundwater sample from ECS-1 was obtained for quality control purposes. All samples were stored on ice immediately upon collection, and submitted to Spectrum Analytical, Inc. in Agawam, Massachusetts for analysis of VOCs plus MTBE by EPA Method 8260 and Total Petroleum Hydrocarbons (TPH) by EPA Method 8100M. No contaminants tested for were detected. The complete laboratory data sheets and chain of custody record are presented in Appendix D.

4.0 Risk Evaluation

4.1 Potential Sources

No evidence of soil and groundwater contamination was detected at any of the soil borings; however, no boring was advanced in the former tank grave due to the presence of a new UST in that location. During the removal of the 1,000 gallon #2 fuel oil UST in September of 1997, soil contamination was observed beneath the tank. The source of the release was the UST which was removed from the site. Approximately 50 cubic yards of soil were excavated and polyencapsulated to the south of Presser Music Building, removing an additional source of contamination which could pose a risk for sensitive receptor impact.

4.2 Potential Receptors

The potential sensitive receptors of most immediate concern are the residents and occupants of the site, as no neighboring properties are located within a 1/4 mile radius. The Presser Music Building is located approximately 2 feet topographically and hydrogeologically downgradient from the tank grave. The drinking water supply well is located upgradient and approximately ½ mile from the tank grave. There are no other residences or water supplies within a ½ mile radius of the site. This campus is occupied year-round; however, the dorms are not occupied by the same residents through the year. The closest downgradient structure is the Presser Music Building. Air in the music building was screened for VOCs with a PID. No VOCs were detected in the Presser Music Building.

The Pond Brook, located approximately 1,500 feet downgradient and to the south, is the nearest potential sensitive environmental receptor.

5.0 Conclusions

ECS presents the following conclusions based on the information obtained at the site to date:

- Groundwater flow direction at the site can be interpreted to be to the south-southeast.
- No contaminants tested for were detected in groundwater from a monitoring well installed east of the former location of the fuel oil UST removed from the site in September 1997.
- Bedrock is located at the deepest extent of the tank grave, and the foundation wall of Presser Music Building acts as a downgradient migration barrier. No VOCs or TPH were detected in soil samples from downgradient soil borings;
- no VOCs were detected in the indoor air of the Presser Music Building, the nearest downgradient structure from the tank grave;
- the source of the release, a 1,000 gallon fuel oil UST, has been removed from the site. Presently, contamination of soil and groundwater appears to have been restricted to the tank grave and excavated and stockpiled soils.

6.0 Recommendations

ECS recommends that the monitoring wells at this site be sampled in the spring time, when groundwater elevations are highest. Groundwater quality data from downgradient wells would allow for accurate analysis of potential impact of the release to groundwater. If after the next sampling round no contaminants are present, then the site could be considered for closure.

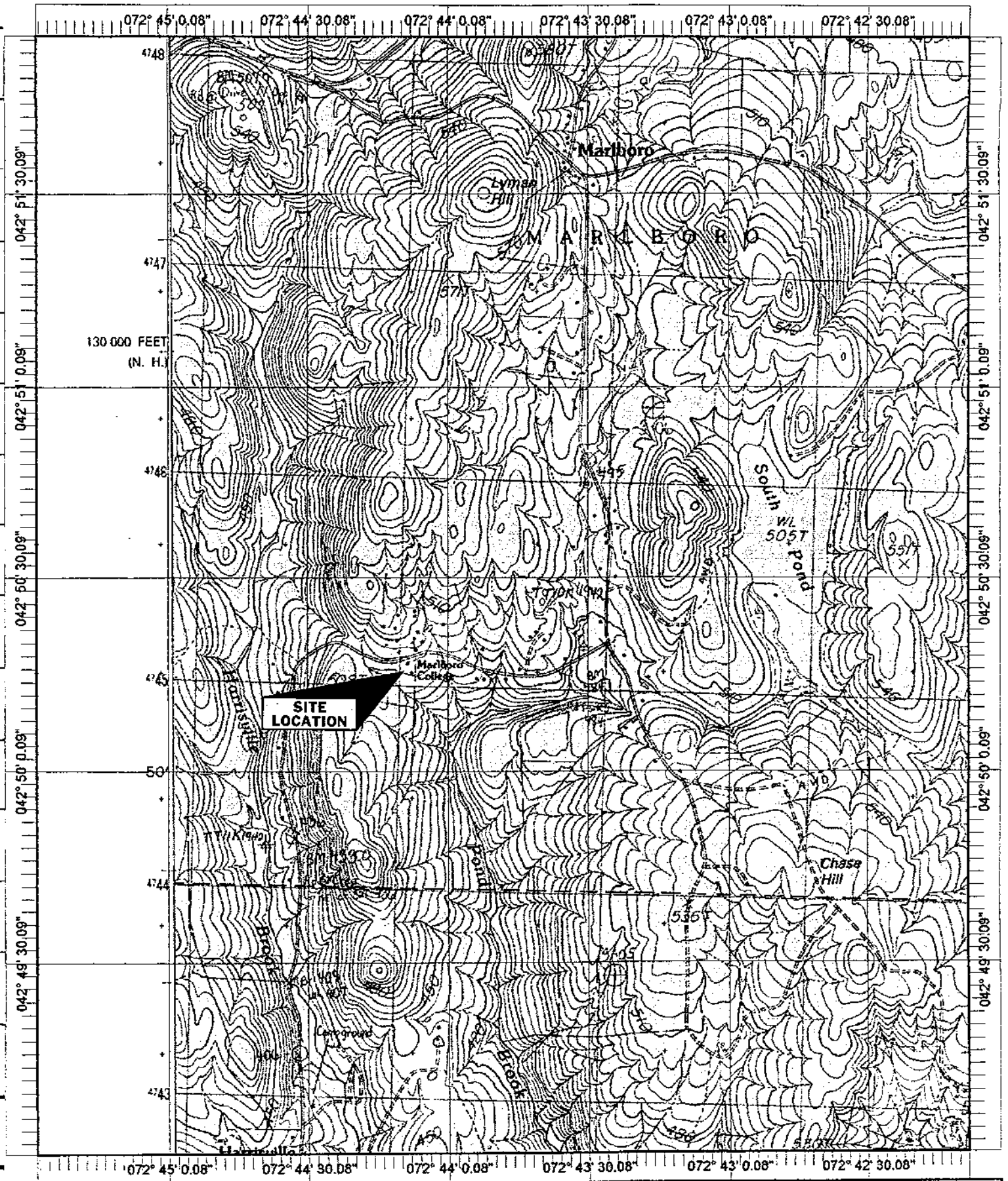
In addition, ECS recommends that samples from the polyencapsulated soil stockpile be screened for VOCs with a PID, to assess contaminant levels in the pile and determine whether they may be thin spread on site.

Pending DEC approval of these recommendations, ECS will schedule a sampling event for April, 1999.

\40062.10\Summary.rpt.wpd

Appendix A

Site Locus Map

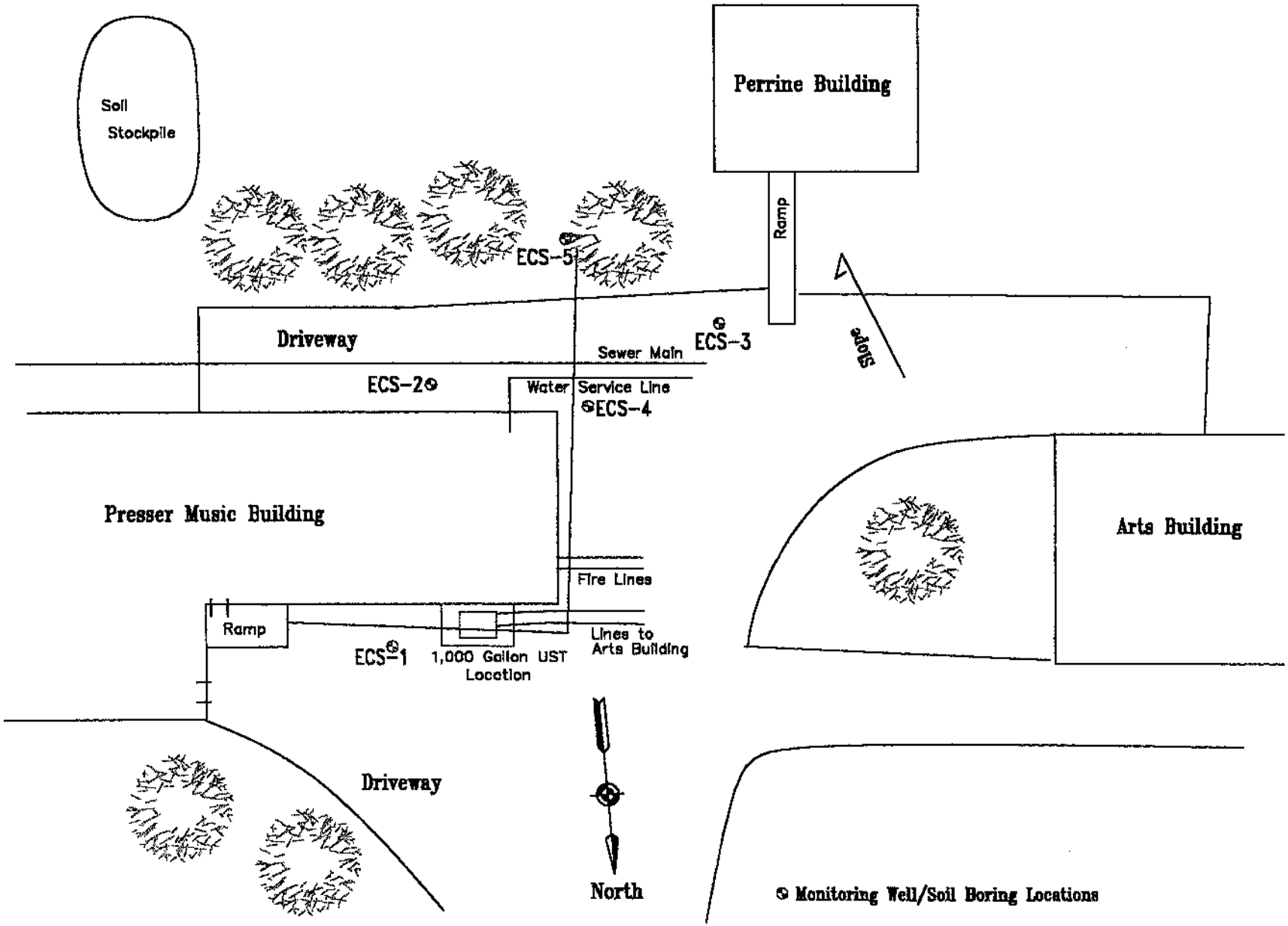


Name: BRATTLEBORO
Date: 11/24/98
Scale: 1 inch equals 2000 feet

Location: 042° 50' 27.4" N 072° 43' 48.4" W
Caption: Presser Music Building
Marlboro College
Marlboro, VT 05344

Appendix B

Site Plan



ENVIRONMENTAL COMPLIANCE SERVICES, INC.
167 Old Guilford Road, #8, Brattleboro, VT 05301

REVISIONS		
No.	Date	Description

PROJECT:
Presser Music Building
Marlboro College
Marlboro, VT

TITLE:
Site Plan

COMPUTER CADFILE : S-40082.10_2.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
cs	dcb	bet	bet
SCALE:	**DATE:**	**JOB NO.:**	**FIGURE NO.:**
N.T.S.	Nov. 1998	40082.10	1

Appendix C

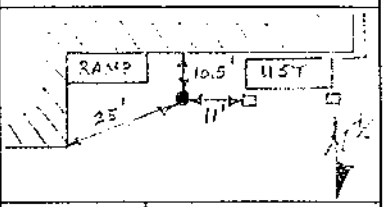
Soil Boring/Monitoring Well Construction Logs

Environmental Compliance Services, Inc.
157 Old Guilford Road, #6, Brattleboro, Vermont 05301
Telephone No.: (802) 257-1195 Fax No.: (802) 257-1603
Visit Our Home Web Page: http://www.ecs-inc.net

SOIL BORING / MONITORING WELL LOG

BORING NO.:	ECS-1
DOCUMENT NO.:	
SHEET	1 OF 1

LOCATION

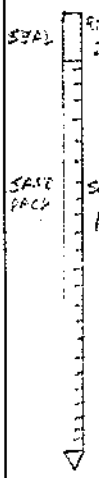


BORING COMPANY:	Environmental Compliance Services	JOB NUMBER:	40062
BORING COMPANY ADDRESS:	538 Silver Street, Agawam, MA 01001	PROJECT NAME:	Presser Music Building
FOREMAN:	Nick Cardinale	PROJECT ADDRESS:	Mrarlboro College
ECS INSPECTOR:	David Balk	CLIENT NAME:	Marlboro College

GROUND WATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE			
			SIZE INSIDE DIAMETER			
			HAMMER WEIGHT			
			HAMMER FALL			
			SPECIAL NOTES:			

Casing Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	August 18, 1998
Date Completed	

Depth	Sample Number	Sample Depths From - To	Penetration Recovery	Blows per 6" Penetration	Strata Changes	Soil Description	Well As Built	Field Testing	Notes
0-2						Dark Brown, Fine Silt and Sand with some gravel			
			Grab	NA				0	
5-7				8		Dark Brown, Fine Silt and Sand with some gravel			
				12					
				27					
				37					
			18					0	
10-12				29		Light Brown, Fine Silt and Sand with some gravel			
				39		Shist layer 8"			
				26		Wet at 11'			
				40					
			18					0	
12-14				8		Light Brown, Fine Silt and Sand			
				15		Wet			
				34		Refusal at 12.5' set well			
				34					
			6					0	



REMARKS:

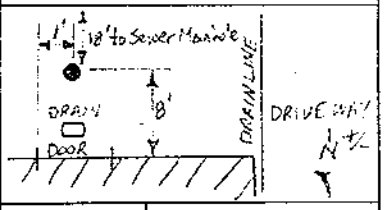
Environmental Compliance Services, Inc.
157 Old Guilford Road, #6, Brattleboro, Vermont 05301
Telephone No.: (802) 257-1195 Fax No.: (802) 257-1603
Visit Our Home Web Page: http://www.ecs-inc.net

SOIL BORING / MONITORING WELL LOG

BORING NO.:	ECS-2
DOCUMENT NO.:	
SHEET	1 OF 1

BORING COMPANY:	Environmental Compliance Services	JOB NUMBER:	40062
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, MA 01001	PROJECT NAME:	Presser Music Building
FOREMAN:	Nick Cardinale	PROJECT ADDRESS:	Mrarlboro College
ECS INSPECTOR:	David Balk	CLIENT NAME:	Marlboro College

LOCATION



GROUND WATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE			
			SIZE INSIDE DIAMETER			
			HAMMER WEIGHT			
			HAMMER FALL			
			SPECIAL NOTES:			

Casing Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	August 18, 1998
Date Completed	

Depth	Sample Number	Sample Depths From - To	Penetration Recovery	Blows per 6" Penetration	Strata Changes	Soil Description	Well As Built	Field Testing	Notes
0-2						Dark Brown, Fine Silt and Sand with some gravel	SEAL RISER 2'		
			Grab	NA				0	
5-7				10		Light Brown, Fine Silt and Sand with some gravel	SAND PACK SCREEN 5'		
				23					
				23					
				3"-50					
			12					0	
7-9				3"-50		Stone in spoon- Refusal at 7" set well			
			2					NA	

REMARKS:

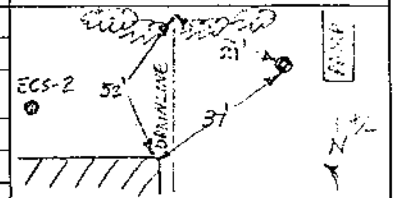
Environmental Compliance Services, Inc.
157 Old Guilford Road, #6, Brattleboro, Vermont 05301
Telephone No.: (802) 257-1195 Fax No.: (802) 257-1603
Visit Our Home Web Page: http://www.ecs-inc.net

SOIL BORING / MONITORING WELL LOG

BORING NO.:	ECS-3
DOCUMENT NO.:	
SHEET	1 OF 1

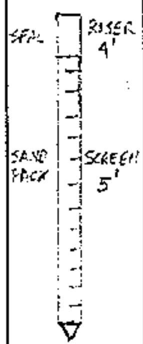
BORING COMPANY:	Environmental Compliance Services	JOB NUMBER:	40062
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, MA 01001	PROJECT NAME:	Presser Music Building
FOREMAN:	Nick Cardinale	PROJECT ADDRESS:	Mrarlboro College
ECS INSPECTOR:	David Balk	CLIENT NAME:	Marlboro College

LOCATION



GROUND WATER OBSERVATIONS				CASING	SAMPLER	CORE BARREL
Date	Depth	Stabilization Time	TYPE			
			SIZE INSIDE DIAMETER			
			HAMMER WEIGHT			
			HAMMER FALL			
			SPECIAL NOTES:			

Casing Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	August 18, 1998
Date Completed	

Depth	Sample Number	Sample Depths From - To	Penetration Recovery	Blows per 6" Penetration	Strata Changes	Soil Description	Well As Built	Field Testing	Notes
0-2						Dark Brown, Fine Silt and Sand with some gravel			
			Grab	NA				0	
5-7				12		Light Brown, Fine Silt and Sand with some gravel			
				26					
				40					
				40					
			20					0	
9-11				3"-40		Refusal at 9' Set well			
			NA					NA	

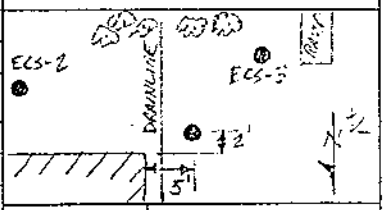
REMARKS:

Environmental Compliance Services, Inc.
157 Old Guilford Road, #6, Brattleboro, Vermont 05301
Telephone No.: (802) 257-1195 Fax No.: (802) 257-1603
Visit Our Home Web Page: http://www.ecs-inc.net

SOIL BORING / MONITORING WELL LOG

BORING NO.:	ECS-4
DOCUMENT NO.:	
SHEET	1 OF 1

LOCATION



BORING COMPANY:	Environmental Compliance Services	JOB NUMBER:	40062
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, MA 01001	PROJECT NAME:	Presser Music Building
FOREMAN:	Nick Cardinale	PROJECT ADDRESS:	Mrarlboro College
ECS INSPECTOR:	David Balk	CLIENT NAME:	Marlboro College

GROUND WATER OBSERVATIONS		
Date	Depth	Stabilization Time

	CASING	SAMPLER	CORE BARREL
TYPE			
SIZE INSIDE DIAMETER			
HAMMER WEIGHT			
HAMMER FALL			

SPECIAL NOTES:

Casing Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	August 18, 1998
Date Completed	

Depth	Sample Number	Sample Depths From - To	Penetration Recovery	Blows per 6" Penetration	Strata Changes	Soil Description	Well As Built	Field Testing	Notes
0-2						Dark Brown, Fine Silt and Sand with some gravel			
							NO WELL SET		
			Grab	NA				0	
5-7				10		Dark Brown, Fine Silt and Sand with some gravel			
				5					
				4"- 50					
			8	Refusal		Refusal dry no well set		0	

REMARKS:

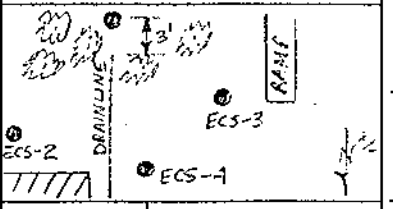
Environmental Compliance Services, Inc.
157 Old Guilford Road, #6, Brattleboro, Vermont 05301
Telephone No.: (802) 257-1195 Fax No.: (802) 257-1603
Visit Our Home Web Page: http://www.ecs-inc.net

SOIL BORING / MONITORING WELL LOG

BORING NO.:	ECS-5
DOCUMENT NO.:	
SHEET	1 OF 1

BORING COMPANY:	Environmental Compliance Services	JOB NUMBER:	40062
BORING COMPANY ADDRESS:	588 Silver Street, Agawam, MA 01001	PROJECT NAME:	Presser Music Building
FOREMAN:	Nick Cardinale	PROJECT ADDRESS:	Mrarlboro College
ECS INSPECTOR:	David Balk	CLIENT NAME:	Marlboro College

LOCATION



GROUND WATER OBSERVATIONS		
Date	Depth	Stabilization Time

	CASING	SAMPLER	CORE BARREL
TYPE			
SIZE INSIDE DIAMETER			
HAMMER WEIGHT			
HAMMER FALL			

SPECIAL NOTES:

Casing Elevation (ft.)	
Surface Elevation (ft.)	
Date Started	August 18, 1998
Date Completed	

Depth	Sample Number	Sample Depths From - To	Penetration Recovery	Blows per 6" Penetration	Strata Changes	Soil Description	Well As Built	Field Testing	Notes
0-2			Grab	NA		Light Brown, Fine Silt and Sand with some gravel	NO WELL SET	0	
2-3			Grab	NA		Yellowish BrownFfine Silt and Sand End of hand auger		0	

REMARKS:

Appendix D

Laboratory Data Sheets and Chain of Custody Record

SPECTRUM ANALYTICAL, INC.

Massachusetts Certification M-MA 138
Connecticut Approval # PH 0777
Rhode Island # 98 & Maine # n/a
New Hampshire ID # 2538
New York ID #11393
Florida HRS87448

ECS, Inc.
157 Old Guilford Road, #6
Brattleboro, VT 05301

September 10, 1998

Attn: David Balk

Client Project No.: **40062** Location: **Marlboro College- Marlboro, VT**

Lab ID No.	Client ID	Analysis Requested
AB16474	ECS-1	EPA Method 8260 TPH by GC
AB16475	DUP	EPA Method 8260
AB16476	TRIP	EPA Method 8260

Authorized by

Hanibal Tayeh
President/Laboratory Director

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **ECS-1**
Lab ID No: **AB16474**

Location: **Marlboro College- Marlboro, VT**
Client Job No.: **40062**

Matrix: **Water**
Sampled on08/26/98 by ECS-VT
Received on 08/27/98 by LC
QC and Data Review by AM

Preservative: Refrigeration, HCl
Container : 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

EPA Method 8260

Parameter for AB16474	Result (ug/L)	MDL	Analyzed	Analys
Benzene	Not detected	1.0	09/05/98	CH
Bromobenzene	Not detected	1.0	09/05/98	CH
Bromochloromethane	Not detected	1.0	09/05/98	CH
Bromodichloromethane	Not detected	1.0	09/05/98	CH
Bromoform	Not detected	1.0	09/05/98	CH
Bromomethane	Not detected	1.0	09/05/98	CH
n-Butylbenzene	Not detected	1.0	09/05/98	CH
sec-Butylbenzene	Not detected	1.0	09/05/98	CH
tert-Butylbenzene	Not detected	1.0	09/05/98	CH
Carbon tetrachloride	Not detected	1.0	09/05/98	CH
Chlorobenzene	Not detected	1.0	09/05/98	CH
Chloroethane	Not detected	1.0	09/05/98	CH
Chloroform	Not detected	1.0	09/05/98	CH
Chloromethane	Not detected	1.0	09/05/98	CH
2-Chlorotoluene	Not detected	1.0	09/05/98	CH
4-Chlorotoluene	Not detected	1.0	09/05/98	CH
1,2-Dibromo-3-chloropropane	Not detected	1.0	09/05/98	CH
Dibromochloromethane	Not detected	1.0	09/05/98	CH
1,2-Dibromoethane (EDB)	Not detected	1.0	09/05/98	CH
Dibromomethane	Not detected	1.0	09/05/98	CH
1,2-Dichlorobenzene	Not detected	1.0	09/05/98	CH
1,3-Dichlorobenzene	Not detected	1.0	09/05/98	CH
1,4-Dichlorobenzene	Not detected	1.0	09/05/98	CH
Dichlorodifluoromethane	Not detected	1.0	09/05/98	CH
1,1-Dichloroethane	Not detected	1.0	09/05/98	CH
1,2-Dichloroethane	Not detected	1.0	09/05/98	CH
1,1-Dichloroethene	Not detected	1.0	09/05/98	CH
cis-1,2-Dichloroethene	Not detected	1.0	09/05/98	CH
trans-1,2-Dichloroethene	Not detected	1.0	09/05/98	CH
1,2-Dichloropropane	Not detected	1.0	09/05/98	CH
1,3-Dichloropropane	Not detected	1.0	09/05/98	CH
2,2-Dichloropropane	Not detected	1.0	09/05/98	CH
1,1-Dichloropropene	Not detected	1.0	09/05/98	CH
cis-1,3-Dichloropropene	Not detected	1.0	09/05/98	CH

Continued next page . . .

Volatile Organics
EPA Method 8260

Parameter for AB16474	Result (ug/L)	MDL	Analyzed	Analyst
trans-1,3-Dichloropropene	Not detected	1.0	09/05/98	CH
Ethylbenzene	Not detected	1.0	09/05/98	CH
Hexachlorobutadiene	Not detected	1.0	09/05/98	CH
Isopropylbenzene	Not detected	1.0	09/05/98	CH
4-Isopropyltoluene	Not detected	1.0	09/05/98	CH
Methylene chloride	Not detected	1.0	09/05/98	CH
Naphthalene	Not detected	2.5	09/05/98	CH
n-Propylbenzene	Not detected	1.0	09/05/98	CH
Styrene	Not detected	1.0	09/05/98	CH
1,1,1,2-Tetrachloroethane	Not detected	1.0	09/05/98	CH
1,1,2,2-Tetrachloroethane	Not detected	1.0	09/05/98	CH
Tetrachloroethene	Not detected	1.0	09/05/98	CH
Toluene	Not detected	1.0	09/05/98	CH
1,2,3-Trichlorobenzene	Not detected	1.0	09/05/98	CH
1,2,4-Trichlorobenzene	Not detected	1.0	09/05/98	CH
1,1,1-Trichloroethane	Not detected	1.0	09/05/98	CH
1,1,2-Trichloroethane	Not detected	1.0	09/05/98	CH
Trichloroethene	Not detected	1.0	09/05/98	CH
Trichlorofluoromethane	Not detected	1.0	09/05/98	CH
1,2,3-Trichloropropane	Not detected	1.0	09/05/98	CH
1,2,4-Trimethylbenzene	Not detected	1.0	09/05/98	CH
1,3,5-Trimethylbenzene	Not detected	1.0	09/05/98	CH
m,p-Xylenes	Not detected	2.0	09/05/98	CH
o-Xylene	Not detected	1.0	09/05/98	CH
Vinyl chloride	Not detected	1.0	09/05/98	CH
Methyl-t-butyl ether	Not detected	1.0	09/05/98	CH
BFB Surrogate Recovery (%)	103		09/05/98	CH
p-DFB Surrogate Recovery (%)	99		09/05/98	CH
CLB-d5 Surrogate Recovery (%)	99		09/05/98	CH

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **DUP**
Lab ID No: **AB16475**

Location: **Marlboro College- Marlboro, VT**
Client Job No.: **40062**

Matrix: **Water**
Sampled on08/26/98 by ECS-VT
Received on 08/27/98 by LC
QC and Data Review by

Preservative: Refrigeration, HCl
Container : 2 VOA Vials
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

EPA Method 8260

Parameter for AB16475	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1.0	09/09/98	CH
Bromobenzene	Not detected	1.0	09/09/98	CH
Bromochloromethane	Not detected	1.0	09/09/98	CH
Bromodichloromethane	Not detected	1.0	09/09/98	CH
Bromoform	Not detected	1.0	09/09/98	CH
Bromomethane	Not detected	1.0	09/09/98	CH
n-Butylbenzene	Not detected	1.0	09/09/98	CH
sec-Butylbenzene	Not detected	1.0	09/09/98	CH
tert-Butylbenzene	Not detected	1.0	09/09/98	CH
Carbon tetrachloride	Not detected	1.0	09/09/98	CH
Chlorobenzene	Not detected	1.0	09/09/98	CH
Chloroethane	Not detected	1.0	09/09/98	CH
Chloroform	Not detected	1.0	09/09/98	CH
Chloromethane	Not detected	1.0	09/09/98	CH
2-Chlorotoluene	Not detected	1.0	09/09/98	CH
4-Chlorotoluene	Not detected	1.0	09/09/98	CH
1,2-Dibromo-3-chloropropane	Not detected	1.0	09/09/98	CH
Dibromochloromethane	Not detected	1.0	09/09/98	CH
1,2-Dibromoethane (EDB)	Not detected	1.0	09/09/98	CH
Dibromomethane	Not detected	1.0	09/09/98	CH
1,2-Dichlorobenzene	Not detected	1.0	09/09/98	CH
1,3-Dichlorobenzene	Not detected	1.0	09/09/98	CH
1,4-Dichlorobenzene	Not detected	1.0	09/09/98	CH
Dichlorodifluoromethane	Not detected	1.0	09/09/98	CH
1,1-Dichloroethane	Not detected	1.0	09/09/98	CH
1,2-Dichloroethane	Not detected	1.0	09/09/98	CH
1,1-Dichloroethene	Not detected	1.0	09/09/98	CH
cis-1,2-Dichloroethene	Not detected	1.0	09/09/98	CH
trans-1,2-Dichloroethene	Not detected	1.0	09/09/98	CH
1,2-Dichloropropane	Not detected	1.0	09/09/98	CH
1,3-Dichloropropane	Not detected	1.0	09/09/98	CH
2,2-Dichloropropane	Not detected	1.0	09/09/98	CH
1,1-Dichloropropene	Not detected	1.0	09/09/98	CH
cis-1,3-Dichloropropene	Not detected	1.0	09/09/98	CH

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Volatile Organics
EPA Method 8260

Parameter for AB16475	Result (ug/L)	MDL	Analyzed	Analyst
trans-1,3-Dichloropropene	Not detected	1.0	09/09/98	CH
Ethylbenzene	Not detected	1.0	09/09/98	CH
Hexachlorobutadiene	Not detected	1.0	09/09/98	CH
Isopropylbenzene	Not detected	1.0	09/09/98	CH
4-Isopropyltoluene	Not detected	1.0	09/09/98	CH
Methylene chloride	Not detected	1.0	09/09/98	CH
Naphthalene	Not detected	1.0	09/09/98	CH
n-Propylbenzene	Not detected	1.0	09/09/98	CH
Styrene	Not detected	1.0	09/09/98	CH
1,1,1,2-Tetrachloroethane	Not detected	1.0	09/09/98	CH
1,1,2,2-Tetrachloroethane	Not detected	1.0	09/09/98	CH
Tetrachloroethene	Not detected	1.0	09/09/98	CH
Toluene	Not detected	1.0	09/09/98	CH
1,2,3-Trichlorobenzene	Not detected	1.0	09/09/98	CH
1,2,4-Trichlorobenzene	Not detected	1.0	09/09/98	CH
1,1,1-Trichloroethane	Not detected	1.0	09/09/98	CH
1,1,2-Trichloroethane	Not detected	1.0	09/09/98	CH
Trichloroethene	Not detected	1.0	09/09/98	CH
Trichlorofluoromethane	Not detected	1.0	09/09/98	CH
1,2,3-Trichloropropane	Not detected	1.0	09/09/98	CH
1,2,4-Trimethylbenzene	Not detected	1.0	09/09/98	CH
1,3,5-Trimethylbenzene	Not detected	1.0	09/09/98	CH
m,p-Xylenes	Not detected	2.0	09/09/98	CH
o-Xylene	Not detected	1.0	09/09/98	CH
Vinyl chloride	Not detected	1.0	09/09/98	CH
Methyl-t-butyl ether	Not detected	1.0	09/09/98	CH
BFB Surrogate Recovery (%)	122		09/09/98	CH
p-DFB Surrogate Recovery (%)	106		09/09/98	CH
CLB-d5 Surrogate Recovery (%)	117		09/09/98	CH

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **ECS-1**
Lab ID No.: **AB16474**

Location: **Marlboro College- Marlboro, VT**
Client Job No.: **40062**

Matrix: Water
Collected: 08/26/98 by ECS-VT
Received on 08/27/98 by LC
QC and Data Review by AM

Preservative: Refrigeration
Container: 1 Amber Glass Liter
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/L)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected		09/02/98	09/08/98	ATP
Fingerprint based quantification:					
Gasoline	Not detected	0.2	09/02/98	09/08/98	ATP
Fuel Oil #2	Not detected	0.4	09/02/98	09/08/98	ATP
Fuel Oil #4	Not detected	0.7	09/02/98	09/08/98	ATP
Fuel Oil #6	Not detected	0.7	09/02/98	09/08/98	ATP
Motor Oil	Not detected	0.7	09/02/98	09/08/98	ATP
Ligroin	Not detected	0.4	09/02/98	09/08/98	ATP
Aviation Fuel	Not detected	0.4	09/02/98	09/08/98	ATP
Other Oil	Not detected	0.7	09/02/98	09/08/98	ATP
Unidentified	Not detected		09/02/98	09/08/98	ATP

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.
Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.
Fuel Oil #4 - Includes #4 Fuel Oil.
Fuel Oil #6 - includes #6 oil and bunker "C" oil.
Motor Oil - includes virgin and waste automobile.
Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.
Aviation Fuels - includes Kerosene, Jet A and JP-4.
Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample. A * in the results column indicates the petroleum calibration used to quantify unidentified samples.

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: **TRIP**
Lab ID No: **AB16476**

Location: **Marlboro College- Marlboro, VT**
Client Job No.: **40062**

Matrix: **Water**
Sampled on08/26/98 by ECS-VT
Received on 08/27/98 by LC
QC and Data Review by AM

Preservative: Refrigeration, HCl
Container : 1 VOA Vial
Condition of Sample as Received: Satisfactory
Delivered by: Courier

Volatile Organics

EPA Method 8260

Parameter for AB16476	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1.0	09/08/98	CH
Bromobenzene	Not detected	1.0	09/08/98	CH
Bromochloromethane	Not detected	1.0	09/08/98	CH
Bromodichloromethane	Not detected	1.0	09/08/98	CH
Bromoform	Not detected	1.0	09/08/98	CH
Bromomethane	Not detected	1.0	09/08/98	CH
n-Butylbenzene	Not detected	1.0	09/08/98	CH
sec-Butylbenzene	Not detected	1.0	09/08/98	CH
tert-Butylbenzene	Not detected	1.0	09/08/98	CH
Carbon tetrachloride	Not detected	1.0	09/08/98	CH
Chlorobenzene	Not detected	1.0	09/08/98	CH
Chloroethane	Not detected	1.0	09/08/98	CH
Chloroform	Not detected	1.0	09/08/98	CH
Chloromethane	Not detected	1.0	09/08/98	CH
2-Chlorotoluene	Not detected	1.0	09/08/98	CH
4-Chlorotoluene	Not detected	1.0	09/08/98	CH
1,2-Dibromo-3-chloropropane	Not detected	1.0	09/08/98	CH
Dibromochloromethane	Not detected	1.0	09/08/98	CH
1,2-Dibromoethane (EDB)	Not detected	1.0	09/08/98	CH
Dibromomethane	Not detected	1.0	09/08/98	CH
1,2-Dichlorobenzene	Not detected	1.0	09/08/98	CH
1,3-Dichlorobenzene	Not detected	1.0	09/08/98	CH
1,4-Dichlorobenzene	Not detected	1.0	09/08/98	CH
Dichlorodifluoromethane	Not detected	1.0	09/08/98	CH
1,1-Dichloroethane	Not detected	1.0	09/08/98	CH
1,2-Dichloroethane	Not detected	1.0	09/08/98	CH
1,1-Dichloroethene	Not detected	1.0	09/08/98	CH
cis-1,2-Dichloroethene	Not detected	1.0	09/08/98	CH
trans-1,2-Dichloroethene	Not detected	1.0	09/08/98	CH
1,2-Dichloropropane	Not detected	1.0	09/08/98	CH
1,3-Dichloropropane	Not detected	1.0	09/08/98	CH
2,2-Dichloropropane	Not detected	1.0	09/08/98	CH
1,1-Dichloropropene	Not detected	1.0	09/08/98	CH
cis-1,3-Dichloropropene	Not detected	1.0	09/08/98	CH

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Volatile Organics
EPA Method 8260

Parameter for AB16476	Result (ug/L)	MDL	Analyzed	Analyst
trans-1,3-Dichloropropene	Not detected	1.0	09/08/98	CH
Ethylbenzene	Not detected	1.0	09/08/98	CH
Hexachlorobutadiene	Not detected	2.5	09/08/98	CH
Isopropylbenzene	Not detected	1.0	09/08/98	CH
4-Isopropyltoluene	Not detected	1.0	09/08/98	CH
Methylene chloride	Not detected	1.0	09/08/98	CH
Naphthalene	Not detected	1.0	09/08/98	CH
n-Propylbenzene	Not detected	1.0	09/08/98	CH
Styrene	Not detected	1.0	09/08/98	CH
1,1,1,2-Tetrachloroethane	Not detected	1.0	09/08/98	CH
1,1,2,2-Tetrachloroethane	Not detected	1.0	09/08/98	CH
Tetrachloroethene	Not detected	1.0	09/08/98	CH
Toluene	Not detected	1.0	09/08/98	CH
1,2,3-Trichlorobenzene	Not detected	1.0	09/08/98	CH
1,2,4-Trichlorobenzene	Not detected	1.0	09/08/98	CH
1,1,1-Trichloroethane	Not detected	1.0	09/08/98	CH
1,1,2-Trichloroethane	Not detected	1.0	09/08/98	CH
Trichloroethene	Not detected	1.0	09/08/98	CH
Trichlorofluoromethane	Not detected	1.0	09/08/98	CH
1,2,3-Trichloropropane	Not detected	1.0	09/08/98	CH
1,2,4-Trimethylbenzene	Not detected	1.0	09/08/98	CH
1,3,5-Trimethylbenzene	Not detected	1.0	09/08/98	CH
m,p-Xylenes	Not detected	2.0	09/08/98	CH
o-Xylene	Not detected	1.0	09/08/98	CH
Vinyl chloride	Not detected	1.0	09/08/98	CH
Methyl-t-butyl ether	Not detected	1.0	09/08/98	CH
BFB Surrogate Recovery (%)	117		09/08/98	CH
p-DFB Surrogate Recovery (%)	100		09/08/98	CH
CLB-d5 Surrogate Recovery (%)	107		09/08/98	CH

Spectrum Analytical, Inc.
Laboratory Report Supplement

References

Methods for the Determination of Organic Compounds in Drinking Water. EPA-600/4-88/039. EMSL 1988.

Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. EMSL 1983.

Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. EPA 600/4-82-057. EMSL 1982.

Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846. 1986.

Standard Methods for the Examination of Water and Wastes. APHA-AWWA-WPCF. 16th Edition. 1985.

Standard Methods for Comparison of Waterborne Petroleum Oils by Gas Chromatography. ASTM D 3328. 1982.

Oil Spill Identification System. U.S. Coast Guard CG-D-52-77. 1977.

Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. EMSL 1979.

Choosing Cost-Effective QA/QC (Quality Assurance/Quality Control) Programs for Chemical Anslyses. EPA 600/4-85/056. EMSL 1985.

Report Notations

Not Detected, Not Det, ND or nd	=	*The compound was not detected at a concentration equal to or above the established method detection limit.*	
NC	=	*Not Calculated*	
MCL	=	*EPA Maximum Contamination Level*	
VOA	=	*Volatile Organic Analysis*	
BFB	=	*4-Bromofluorobenzene*	*(An EPA 624 Surrogate)*
p-DFB	=	*1,4-Difluorobenzene*	*(An EPA 624 Surrogate)*
CLB-d5	=	*Chlorobenzene-d5*	*(An EPA 624 Surrogate)*
BCP	=	*2-Bromo-1-chloropropane*	*(An EPA 601 Surrogate)*
TFT	=	*a,a,a-Trifluorotoluene*	*(An EPA 602 Surrogate)*
Decachlorobiphenyl	=	*(an EPA 608/8080 Surrogate)*	

Definitions

Surrogate Recovery = The recovery (expressed as a percent) of a non-method analyte (see surrogates listed above) added to the sample for the purpose of monitoring system performance.

Matrix Spike Recovery = The recovery (expressed as a percent) of method analytes added to the sample for the purpose of determining any effect of sample composition on analyte recovery.

Laboratory Replicate = Two sample aliquots taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of laboratory duplicates give a measure of the preceision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

Field Duplicate = Two separate samples collected at the same time and place under identifical circumstances and treated exactly the same throughout field and laboratory procedures. Analysis of Field duplicates give a measure of the precision associated with sample collection, preservaton and storage, as well as with laboratory procedures.

Relative Percent Difference (% RPD) = The precision measurement obtained on duplicate/replicate analyses. %RPD is calculated as:

$$\%RPD = \frac{(value1 - value2)}{ave.\ value} * 100\%$$

CHAIN OF CUSTODY RECORD

SPECTRUM ANALYTICAL

Page 1 of 1

PROJECT NO.: 40062	REPORT TO: ECS-VT
SITE NAME: Marlboro College - Prosser	
LOCATION: Marlboro STATE VT	ADDRESS:
REFERENCE QUOTE NUMBER (RQN):	CITY STATE ZIP
PURCHASE ORDER NO.:	INVOICE TO: ECS-MA
PROJECT Mgr: D. Balk	
SAMPLER(s): JCP	CITY STATE ZIP

SAMPLE TYPE & MATRIX CODES:

1 = 4°C 2 = HCl 3 = H_2SO_4 4 = HNO_3 5 = OTHER _____

C = COMPOSITE G = GRAB

1 = AQUEOUS 3 = SLUDGE 5 = OTHER _____
2 = SOIL 4 = SEDIMENT

LAB USE ONLY	SAMPLE I.D.	DATE	TIME	MATRIX	SAMPLE TYPE	PRESERVATIVE	CONTAINERS: # 40 ml VOA VIALS	# OF AMBER GLASS LITERS	# OF PLASTIC LITERS	# OF GLASS SOIL JARS	VOC's: 1-601/8010 2-602/8020	1-502/8021 2-524	1-624/8240 2-8260	1-MTBE 2-KETONES	SVOC's: 1-8270 2-BN 3-PAHS	1-PCBS 2-PEST (608/8080)	TPH: 1-GC(8100M) 2-GC(8015M)	1-VPH 2-EPH 3-ID	1-IR(418.1) 2-OIL/GREASE	METALS (1 - Soluble 2 - Total 3 - TCLP): PP13	RCRA8	As, Cd, Cr, Hg, Pb	OTHER: 1-PH 2-FLASH 3-REACT
AA 16474	ECS-1	8/26	10:30	1	G	HCl	2	1					2				1						
AA 16475	DUP	8/26	—	1	G	HCl	2						2										
AA 16476	Trip	8/26	—	1	G	HCl	2						2										
AA																							
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RELINQUISHED BY:	RECEIVED BY:	DATE	TIME
Susan Pettengill	Bob Mungle	8-27-98	11.00
Bob Mungle	Lee Copson	8-27-98	1:35

SPECIAL INSTRUCTIONS: _____

☐ Fax results when available to (_____) _____

SPECIAL HANDLING: *Please check*

- ☐ Return Sample after Analysis
- ☐ Dispose of Sample after 60 days
- ☒ Standard TAT - 7 to 10 Business days
- ☐ Special TAT - 24 hr - 48 hr - 72 hr - 5 b. days

• TAT begins when sample is received at test facility.
• TAT for samples rec'd after 3 pm will begin on the next business day.
• All TAT's are subject to laboratory approval and customer consent.

DATE RESULTS NEEDED: _____

11 Almgren Drive • Agawam, Massachusetts 01001 • 413-789-9018 • Fax 413-789-4076