

ENVIRONMENTAL COMPLIANCE SERVICES, INC.

December 10, 1998

CLIENT

Fleming Oil, Inc.
1 Putney Road
Brattleboro, VT 05301

JOB #

40057.30

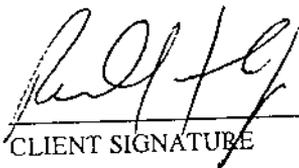
TITLE & DATE OF REPORT

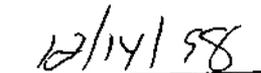
"Site Investigation Report," Fleming Oil Company, 1 Putney Road, Brattleboro, VT
SMS Site #96-1982

December 10, 1998

I have read the above-referenced report and hereby authorize Environmental Compliance Services, Inc. to distribute it to:

VT DEC Waste Management Division
Sites Management Section
103 South Main Street/West Bldg.
Waterbury, VT 05671-0404


CLIENT SIGNATURE


DATE

WASTE MANAGEMENT DIVISION

DEC 18 10 25 AM '98

Phase	Type
<input checked="" type="checkbox"/> Initial Site Investigation <input type="checkbox"/> Corrective Action Feasibility Investigation <input type="checkbox"/> Corrective Action Plan <input type="checkbox"/> Corrective Action Summary Report <input type="checkbox"/> Operations and Monitoring Report	<input type="checkbox"/> Work Scope <input checked="" type="checkbox"/> Technical Report <input type="checkbox"/> PCF Reimbursement Request <input type="checkbox"/> General Correspondence

Site Investigation Report

Fleming Oil Company
 1 Putney Road
 Brattleboro, Vermont
 SMS Site #96-1982

DEC 19 10 25 AM '98
 STATE DEPARTMENT

Prepared for:

Fleming Oil Company
 1 Putney Road
 Brattleboro, Vermont 05301
 Contact: Richard Fleming Jr., President
 Phone: (802) 254-6095

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 10, 1998

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1.0 Introduction

In September 1997, product piping was replaced for three 20,000 gallon #2 fuel oil underground storage tanks (USTs) and one 20,000 gallon kerosene UST on the east side of the Fleming Oil Company building at 1 Putney Road, Brattleboro, Vermont ("the site"; see locus map, Appendix A). One 2,000 gallon waste oil UST was removed from the site on September 3, 1997 with oversight by Susan Thayer of the Vermont Department of Conservation (VT DEC). A soil sample was collected from the waste oil tank grave, and contained no contaminants tested for at levels greater than minimum detection limits. Soils from the product piping upgrade were screened with a Photovac Model 2020 photoionization detector (PID) for the presence of Volatile Organic Compounds (VOCs). Concentrations ranged from 6 to 250 parts per million (ppm). Brown coarse sand and gravel with some cobbles was observed during the removal of the waste oil UST and piping replacement. Neither ledge nor groundwater was encountered in the excavations. A tank closure report was submitted to the VT DEC, which 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 Richard Fleming Jr. of Fleming Oil Company. The work plan included soil boring advancement, groundwater monitoring well installation, and sampling and analysis of groundwater. It was approved by the Sites Management Section (SMS) on July 14, 1998. This report documents the work performed by ECS at the site and presents results, conclusions and recommendations.

The VT DEC also requested additional sampling and analysis of groundwater from existing monitoring wells on the west side of the site, which were installed in April 1996 to address a release discovered during pipe replacement in the gasoline USTs and pump island area. The results of that sampling have been sent under separate cover, and costs of that work will be applied to a separate deductible, at the request of the VT DEC.

2.0 Site Description

Fleming Oil Company is a wholesale/retail distributor of gasoline, #2 fuel oil and kerosene, and provides heating system installation and maintenance services. The site is the bulk storage facility for petroleum and heating system components, and houses the company offices. The site building is heated with #2 fuel oil stored in a UST on the northeast side of the building.

The site is at an elevation of approximately 300 feet above mean sea level, and is abutted by commercial properties to the north, east, and south. The Windham District Court House and Brattleboro town offices are located west of the site, across Putney Road (aka Route 5). A gasoline station is located approximately 100 feet to the north and topographically upgradient of the site. Topography in the vicinity slopes to the southeast toward the Connecticut River, which is located approximately 1,000 feet away from the site at an elevation of about 240 feet above mean sea level.

Previous reports indicate groundwater flow direction toward the Connecticut River. The site and neighboring properties are serviced by municipal drinking water and sewer systems.

3.0 Work Performed

3.1 Monitoring Well

On July 22, 1998, ECS installed one monitoring well, designated ECS-5, downgradient of the bulk dispensing rack at the southeast corner of the site building. ECS-5 was installed to assess the release in this bulk dispensing rack area. Existing wells ECS-1, ECS-2, ECS-3, and ECS-4 were installed on the east side of the site in 1989 to fulfill UST monitoring requirements (Section 503 of Vermont UST Regulations). The existing wells were incorporated in the current sampling event, to assess the release detected during piping replacement for the #2 fuel oil and kerosene USTs. Monitoring well locations are shown on the site plan in Appendix B.

Split spoon samples obtained at five-foot intervals during drilling for installation of the downgradient monitoring well ECS-5 were screened for VOCs with a PID, using bag headspace protocol. VOC levels ranged from 0 ppm to 20 ppm. ECS-5 was constructed of 2 inch diameter schedule 40 PVC slotted screen (size 10) with a flush mounted road box. A monitoring well construction log is included in Appendix C.

3.2 Groundwater Table and Flow Direction

Depth to groundwater was gauged at monitoring wells ECS-1, ECS-2, and ECS-3, located to the north and east of the USTs at the east end of the site. Depth to groundwater ranged from 11.76 feet to 19.00 feet below ground surface (bgs). Monitoring wells ECS-4 and ECS-5 located topographically downgradient of the USTs and bulk dispensing rack did not contain sufficient water for gauging. ECS-5 is 35 feet deep. Based on previous reports, the substrate at the site allows for substantial deviation in groundwater table. A perched water table, as documented in past reports of the site, is sometimes located between ten to fifteen feet bgs above a clay confining layer which is underlain by dry silt and fine sand. General topography and soil types indicate groundwater flow to the south/southeast.

3.3 Groundwater Sampling and Analysis

Groundwater from monitoring wells ECS-1, ECS-2, and ECS-3 was sampled on August 12, 1998, by ECS personnel using disposable plastic bailers. A duplicate groundwater sample from ECS-3 was obtained for quality control purposes. All samples were stored on ice immediately upon collection, and refrigerated until delivery was made to Spectrum Analytical, Inc. in Agawam, Massachusetts for analysis of BTEX compounds, MTBE, Naphthalene and Trimethylbenzenes by EPA Method 8021B. Only monitoring well ECS-3 contained sufficient water for analysis for Total Petroleum Hydrocarbons (TPH) by EPA Method 8100M. Results of laboratory analysis of groundwater samples are summarized in Table 1, which includes Primary Groundwater Quality

Standards (PGQS) for reference. Complete laboratory data sheets and chain of custody record are presented in Appendix D.

Table 1. Results of Laboratory Analysis of Groundwater Samples					
Compound	ECS-1	ECS-2	ECS-3	Duplicate	PGQS
Benzene	ND	ND	ND	ND	5
Toluene	ND	ND	ND	ND	1,000
Ethylbenzene	ND	ND	ND	ND	700
1,2,4-Trimethylbenzene	ND	ND	ND	ND	5
1,3,5-Trimethylbenzene	ND	ND	ND	ND	4
Naphthalene	ND	ND	ND	ND	20
Xylenes	ND	ND	ND	ND	10,000
Total BTEX	-	-	-	-	-
MTBE	ND	ND	ND	ND	40
TPH	NW	NW	170	NS	-

ND = not detected *PGQS = Primary Groundwater Quality Standard*
NW = no water for analysis *NS = not sampled*

4.0 Risk Evaluation

4.1 Potential Sources

Low levels of soil contamination (2 ppm to 20 ppm) were detected by the PID at the monitoring well advanced downgradient of the bulk dispensing rack on the west side of site building. However, insufficient water was available for groundwater sampling. The levels of soil contamination at the USTs reported in the tank closure report ranged from 6 ppm to 250 ppm as detected by the PID. The release was possibly due to overfills at the bulk dispensing rack and the USTs. The piping at both the USTs and the bulk dispensing rack have been replaced.

4.2 Potential Receptors

The potential sensitive receptors of most immediate concern are the employees of the site. The closest downgradient business is approximately 100 feet away. There are no drinking water supplies known to be located within a 1/2 mile radius of the site. Air in the site building was screened for VOCs with a PID. No VOCs were detected in either the office or warehouse areas.

The Connecticut River, located approximately 1,000 feet downgradient and to the southeast, 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:

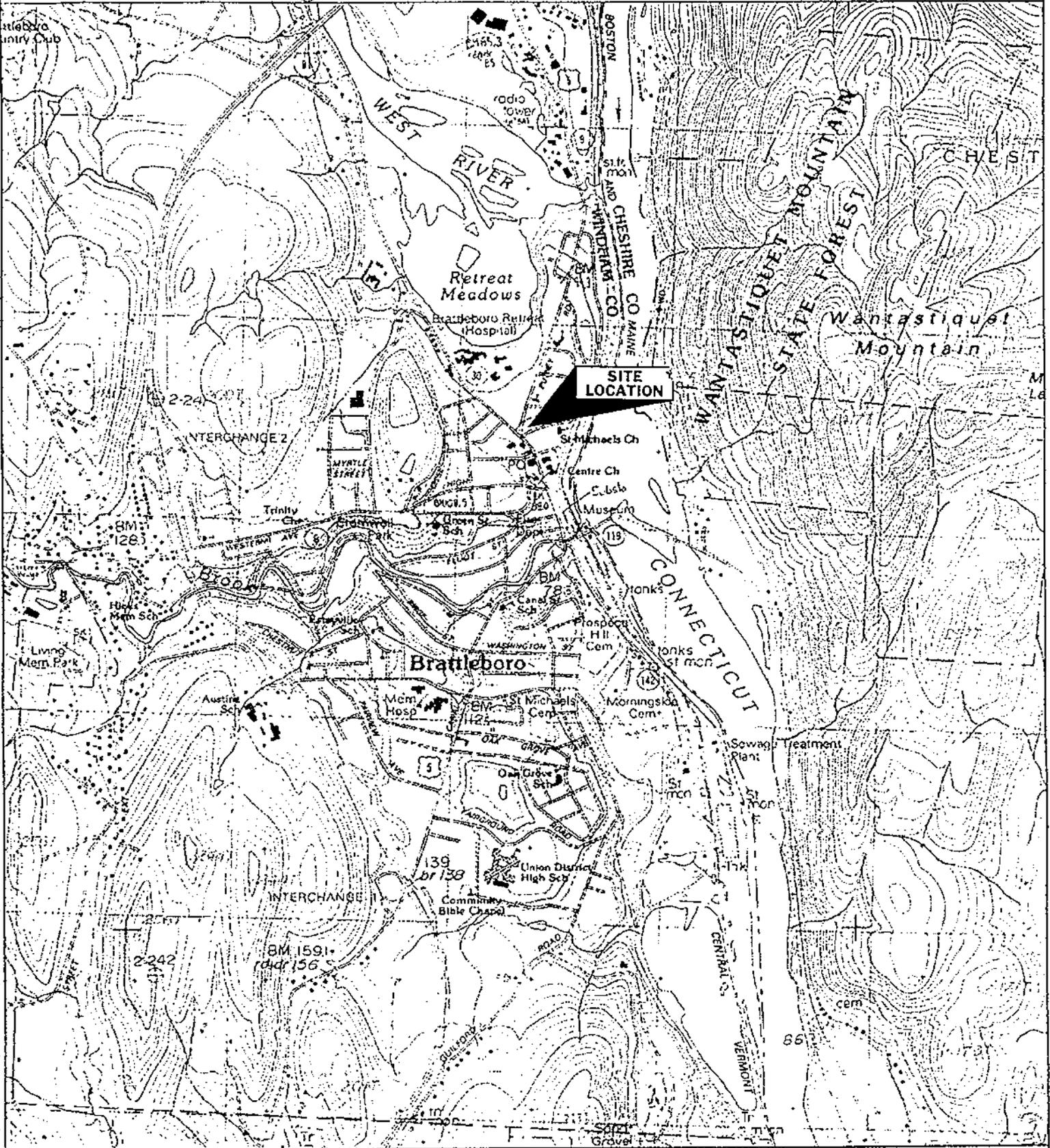
- Groundwater flow direction at the site can be interpreted to be to the south-southeast.
- Low levels of VOC contamination were detected in soil during the installation of monitoring well ECS-5 downgradient of the bulk dispensing rack on the east side of the site building.
- No VOCs tested for were detected in groundwater samples from monitoring wells ECS-1, ECS-2, and ECS-3. Only groundwater from ECS-3 was analyzed for TPH; 170 ppm were detected in that sample.
- No VOCs were detected in the indoor air of the site building.

6.0 Recommendations

ECS recommends that site groundwater be sampled in the springtime, when groundwater elevations are likely to be highest. Data from downgradient wells will allow for accurate analysis of potential impact of the release to groundwater.

\\40057.30\Sum1298.rpt.wpd

Appendix A
Site Locus Map



Name: BRATTLEBORO
 Date: 9/12/97
 Scale: 1 inch equals 2000 feet

Location: 042° 51' 03.5" N 072° 33' 37.6" W
 Caption: Fleming Oil Company
 Bulk Storage Facility
 1 Putney Road, Brattleboro, VT

Appendix B

Site Plan

North



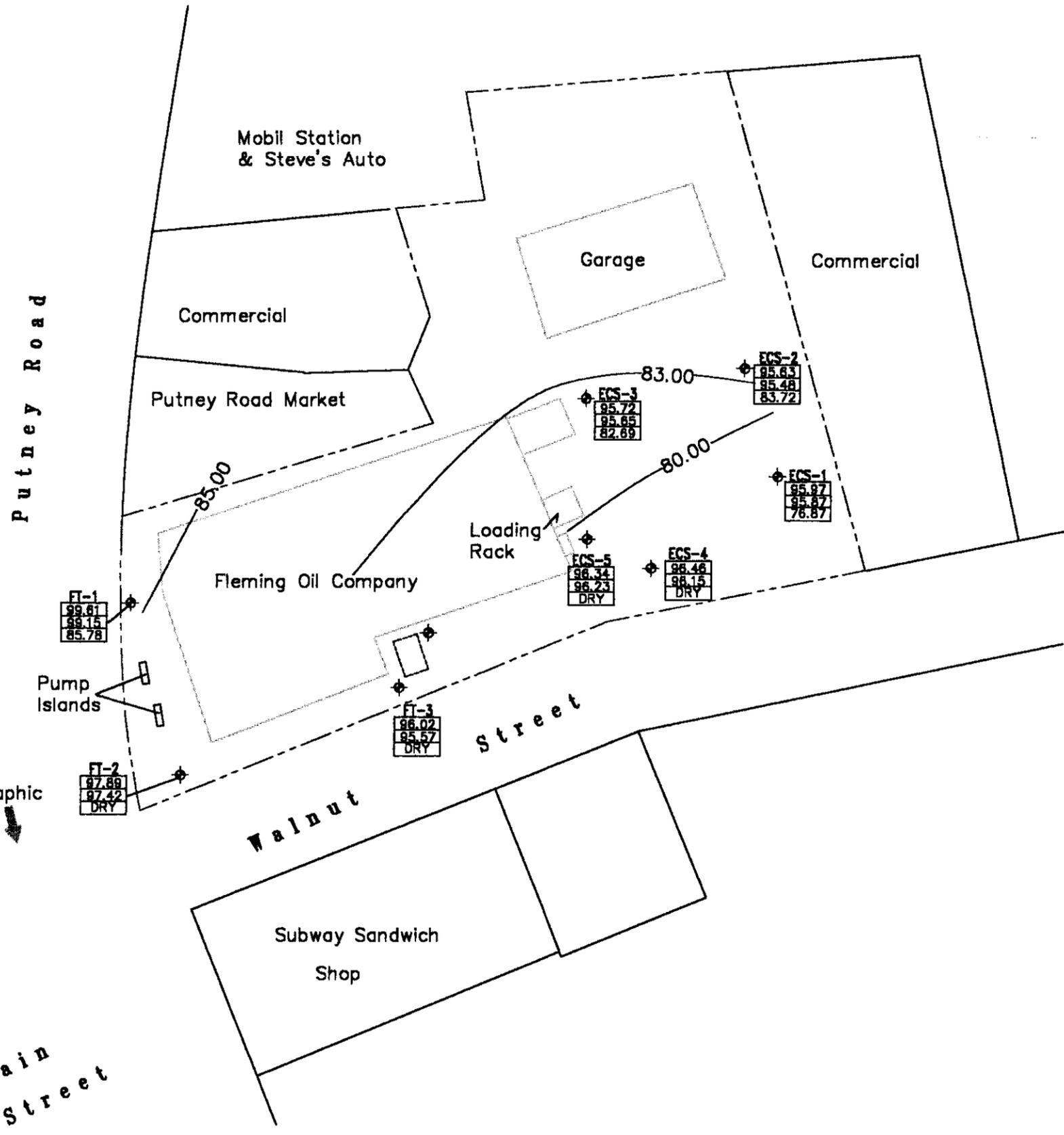
Windham County
Court House

Town Park

Topographic
Slope

Linden
Street

Main
Street



Legend

- Approximate Property Line
- Groundwater Contours
- ◆ Monitoring Well of unknown origin (not sampled)
- ◆ Monitoring Well
- ECS-2 Monitoring Well Identification
- | |
|-------|
| 95.63 |
| 95.48 |
| 83.72 |

 Rim Elevation
PVC Elevation
Groundwater Elevation
- ▭ Fuel Oil UST

General Notes:

Site Plan prepared from information obtained from the Brattleboro Listers Office and a site visit by ECS, Inc. personnel.

All locations, dimensions of the site features, and property lines are approximate. This plan should not be used for construction or land conveyance purposes.

Vertical and horizontal location of monitoring wells and selected site features determined by a site survey conducted by ECS, Inc. personnel.

Groundwater contours are based on measurements made on 8/12/98. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time measurements were made.

Groundwater contours and flow directions assumed homogenous, isotropic aquifer conditions, and horizontal flow.

Groundwater contours are interpolated between data points and inferred in other areas.

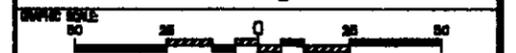


ENVIRONMENTAL COMPLIANCE SERVICES, INC.
187 Old Guilford Road, #8, Brattleboro, VT 06001

PROJECT:
Fleming Texaco
Putney Road
Brattleboro, VT

DATE:
Site Plan with Groundwater Contours

CLIENT:
Richard Fleming, President



COMPUTER CADFILE: E2-40057.30.dwg

DRAWN BY:	DESIGNED BY:	CHECKED BY:	APPROVED BY:
CS	CS	DCB	DCB

SCALE:	DATE:	JOB NO.:	FIGURE NO.:
1" = 50'	Dec. 1998	40057.30	2

Appendix C

Monitoring Well Construction Log

ENVIRONMENTAL COMPLIANCE SERVICES, INC.
SOIL BORING/MONITORING WELL LOG

Project #: <u>40057.20</u> Date: <u>7/22/98</u> Project Name: <u>Fleming Oil Company</u> Location: <u>1 Putney Road, Brattleboro, VT</u> Driller: <u>ECS</u> ECS Personnel: <u>JCP</u> Boring/Well #: <u>ECS-5</u> Sheet <u>1</u> of <u>1</u>	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> WAREHOUSE </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 10px;"> LOADING RACK </div> <p align="center" style="margin-top: 20px;"> ECS-5 </p> <p align="center" style="font-weight: bold; font-size: 1.2em;">SITE LOCUS</p>
--	--

Depth	Blow Counts				Rec. (in.)	OVM (ppm)	Soil Characterization	As Built Diagram
	0-6	6-12	12-18	18-24				
0-2	2	3	4	5	24"	0.0	Blacktop, brown medium sand - dry	
5-7	12	20	11	12	15"	0.0	green- gray very fine sand and orange sand - dry	
10-12	3	3	5	9	4"	20	green-gray clay - wet	
15-17	6	7	7	10	24"	0.1	light brown sand -dry	
20-22	8	8	9	11	24"	0.0	light brown sand -dry	
25-27	9	8	11	11	24"	2	light brown sand -dry	
30-32	9	9	10	13	24"	4	light brown sand -dry	
35-37	2	2	9	7	24"	0.0	light brown sand -dry	

Drilling Method: <u>HSA</u> Total Well Depth: <u>35'</u> Groundwater Depth: _____ PVC Elevation: _____	Screen Diameter: <u>2"</u> Length: <u>20'</u> Riser Diameter: <u>2"</u> Length: <u>15'</u> Slot Size: <u>0.010</u> Ground Elevation: _____
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- Notes:
1. Split spoon soil samples are screened for organic vapors via headspace method using a Photovac 2020 Photoionization detector calibrated to 100 ppm isobutylene and referenced to benzene.
 2. ND indicates nondetectable contaminant concentrations as read by the OVM.
 3. Samples are collected using a Split Spoon Sampler unless otherwise indicated.
 4. Split Spoon Sampler has a 2" diameter and is driven using a 140 lb. hammer falling 30 inches.
 5. HSA = Hollow Stem Auger, AR = Air Rotary

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

RECEIVED SEP 3 1998

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

August 28, 1998

Attn: David Balk

Client Project No.: 40057.10 Location: Fleming Texaco-Brattleboro, VT

<u>Lab ID No.</u>	<u>Client ID</u>	<u>Analysis Requested</u>
AB14887	ECS-1	EPA Method 602
AB14888	ECS-2	EPA Method 602
AB14889	ECS-3	EPA Method 602 TPH by GC
AB14890	DUP	EPA Method 602
AB14891	TRIP	EPA Method 602

Authorized by

Hanibal Tayeh
President/Laboratory Director

ENVIRONMENTAL ANALYSES

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Sample ID: **ECS-1**
Lab ID No: **AB14887**

Location: **Fleming Texaco-Brattleboro, VT**
Client Job No: **40057.10**

Matrix: Water
Sampled on 08/12/98 by ECS
Received on 08/13/98 by MBR
QC and Data Review by AM

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

Volatile Aromatics

EPA Method 602

Parameter	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	2.5	08/26/98	CH
Toluene	Not detected	2.5	08/26/98	CH
Ethylbenzene	Not detected	2.5	08/26/98	CH
1,2,4-Trimethylbenzene	Not detected	2.5	08/26/98	CH
1,3,5-Trimethylbenzene	Not detected	2.5	08/26/98	CH
Naphthalene	Not detected	5.0	08/26/98	CH
m,p-Xylenes	Not detected	5.0	08/26/98	CH
o-Xylene	Not detected	2.5	08/26/98	CH
Methyl-t-butyl ether	Not detected	2.5	08/26/98	CH
BFB Surrogate Recovery (%)	102		08/26/98	CH

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Sample ID: ECS-2
Lab ID No: AB14888

Location: Fleming Texaco-Brattleboro, VT
Client Job No: 40057.10

Matrix: Water
Sampled on 08/12/98 by ECS
Received on 08/13/98 by MBR
QC and Data Review by AM

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

Volatile Aromatics

EPA Method 602

Parameter	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1.0	08/26/98	CH
Toluene	Not detected	1.0	08/26/98	CH
Ethylbenzene	Not detected	1.0	08/26/98	CH
1,2,4-Trimethylbenzene	Not detected	1.0	08/26/98	CH
1,3,5-Trimethylbenzene	Not detected	1.0	08/26/98	CH
Naphthalene	Not detected	1.0	08/26/98	CH
m,p-Xylenes	Not detected	2.0	08/26/98	CH
o-Xylene	Not detected	1.0	08/26/98	CH
Methyl-t-butyl ether	Not detected	1.0	08/26/98	CH
BFB Surrogate Recovery (%)	97		08/26/98	CH

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Sample ID: ECS-3
Lab ID No: AB14889

Location: Fleming Texaco-Brattleboro, VT
Client Job No: 40057.10

Matrix: Water
Sampled on 08/12/98 by ECS
Received on 08/13/98 by MBR
QC and Data Review by AM

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

Volatile Aromatics

EPA Method 602

Parameter	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	2.5	08/26/98	CH
Toluene	Not detected	2.5	08/26/98	CH
Ethylbenzene	Not detected	2.5	08/26/98	CH
1,2,4-Trimethylbenzene	Not detected	2.5	08/26/98	CH
1,3,5-Trimethylbenzene	Not detected	2.5	08/26/98	CH
Naphthalene	Not detected	2.5	08/26/98	CH
m,p-Xylenes	Not detected	5.0	08/26/98	CH
o-Xylene	Not detected	2.5	08/26/98	CH
Methyl-t-butyl ether	Not detected	2.5	08/26/98	CH
BFB Surrogate Recovery (%)	91		08/26/98	CH

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Client ID: ECS-3
Lab ID No.: AB14889

Location: Fleming Texaco-Brattleboro, VT
Client Job No.: 40057.10

Matrix: Water
Collected: 08/12/98 by ECS
Received on 08/13/98 by MBR
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)	170		08/21/98	08/25/98	ATP

Fingerprint based quantification:

Gasoline	Not detected	0.2	08/21/98	08/25/98	ATP
Fuel Oil #2	Not detected	0.4	08/21/98	08/25/98	ATP
Fuel Oil #4	Not detected	0.7	08/21/98	08/25/98	ATP
Fuel Oil #6	Not detected	0.7	08/21/98	08/25/98	ATP
Motor Oil	Not detected	0.7	08/21/98	08/25/98	ATP
Ligroin	Not detected	0.4	08/21/98	08/25/98	ATP
Aviation Fuel	Not detected	0.4	08/21/98	08/25/98	ATP
Other Oil	170	0.7	08/21/98	08/25/98	ATP
Unidentified	Not detected		08/21/98	08/25/98	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

Sample ID: **DUP**
Lab ID No: **AB14890**

Location: **Fleming Texaco-Brattleboro, VT**
Client Job No: **40057.10**

Matrix: Water
Sampled on 08/12/98 by ECS
Received on 08/13/98 by MBR
QC and Data Review by AM

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

Volatile Aromatics

EPA Method 602

Parameter	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	2.5	08/26/98	CH
Toluene	Not detected	2.5	08/26/98	CH
Ethylbenzene	Not detected	2.5	08/26/98	CH
1,2,4-Trimethylbenzene	Not detected	2.5	08/26/98	CH
1,3,5-Trimethylbenzene	Not detected	2.5	08/26/98	CH
Naphthalene	Not detected	2.5	08/26/98	CH
m,p-Xylenes	Not detected	5.0	08/26/98	CH
o-Xylene	Not detected	2.5	08/26/98	CH
Methyl-t-butyl ether	Not detected	2.5	08/26/98	CH
BFB Surrogate Recovery (%)	94		08/26/98	CH

SPECTRUM ANALYTICAL, INC.

Laboratory Report

Sample ID: TRIP
Lab ID No: AB14891

Location: Fleming Texaco-Brattleboro, VT
Client Job No: 40057.10

Matrix: Water
Sampled on 08/12/98 by ECS
Received on 08/13/98 by MBR
QC and Data Review by AM

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

Volatile Aromatics

EPA Method 602

Parameter	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1.0	08/26/98	CH
Toluene	Not detected	1.0	08/26/98	CH
Ethylbenzene	Not detected	1.0	08/26/98	CH
1,2,4-Trimethylbenzene	Not detected	1.0	08/26/98	CH
1,3,5-Trimethylbenzene	Not detected	1.0	08/26/98	CH
Naphthalene	Not detected	1.0	08/26/98	CH
m,p-Xylenes	Not detected	2.0	08/26/98	CH
o-Xylene	Not detected	1.0	08/26/98	CH
Methyl-t-butyl ether	Not detected	1.0	08/26/98	CH
BFB Surrogate Recovery (%)	88		08/26/98	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 Analyses. EPA 600/4-85/056. EMSL 1985.

Report Notations

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

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 precision 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 identical 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, preservation and storage, as well as with laboratory procedures.

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

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

CHAIN OF CUSTODY RECORD



Page 1 of 1

SPECTRUM ANALYTICAL

PROJECT NO.: <u>40057.10</u>	REPORT TO: <u>FCS-VT</u>
SITE NAME: <u>Fleming, TEKACO</u>	
LOCATION: <u>Brattleboro</u> STATE <u>VT</u>	ADDRESS:
REFERENCE QUOTE NUMBER (RQN):	CITY STATE ZIP
PURCHASE ORDER NO.:	INVOICE TO: <u>FCS-MA</u>
PROJECT Mgr: <u>D Balk</u>	
SAMPLER(s): <u>DCP + DCB</u>	CITY STATE ZIP

SAMPLE TYPE & MATRIX CODES:

1 = 4°C 2 = HCl 3 = H₂SO₄ 4 = HNO₃ 5 = OTHER

LAB USE ONLY	SAMPLE I.D.	DATE	TIME	MATRIX	SAMPLE TYPE	PRESERVATIVE	# 40 ml VOA VIALS	# OF AMBER GLASS LITERS	# OF PLASTIC LITERS	# OF GLASS SOIL JARS	CONTAINERS	VOC's	SVOC's	TPH	METALS	OTHER				
											1-601/8010 2-602/8020	1-502/8021 2-524	1-624/8240 2-8260	1-MTBE 2-KETONES	1-8270 2-BN 3-PAHS	1-PCBS 2-PEST (608/8080)	1-IR(418.1) 2-OIL/GREASE	1-1R(418.1) 2-OIL/GREASE	1-PH 2-FLASH 3-REACT	
AA 14887	ECS-1	8/12	10:45	1	G	12	2				1-601/8010 2-602/8020	1-502/8021 2-524	1-624/8240 2-8260	1-MTBE 2-KETONES	1-8270 2-BN 3-PAHS	1-PCBS 2-PEST (608/8080)	1-IR(418.1) 2-OIL/GREASE	1-1R(418.1) 2-OIL/GREASE	1-PH 2-FLASH 3-REACT	
AA 14888	FCS-2	8/12	10:37	1	G	12	2				1-601/8010 2-602/8020	1-502/8021 2-524	1-624/8240 2-8260	1-MTBE 2-KETONES	1-8270 2-BN 3-PAHS	1-PCBS 2-PEST (608/8080)	1-IR(418.1) 2-OIL/GREASE	1-1R(418.1) 2-OIL/GREASE	1-PH 2-FLASH 3-REACT	
AA 14889	ECS-3	8/12	10:15	1	G	12	2				1-601/8010 2-602/8020	1-502/8021 2-524	1-624/8240 2-8260	1-MTBE 2-KETONES	1-8270 2-BN 3-PAHS	1-PCBS 2-PEST (608/8080)	1-IR(418.1) 2-OIL/GREASE	1-1R(418.1) 2-OIL/GREASE	1-PH 2-FLASH 3-REACT	
AA	ECOSH/VT																			
AA 14890	DUP	8/12	-	1	G	12	2				1-601/8010 2-602/8020	1-502/8021 2-524	1-624/8240 2-8260	1-MTBE 2-KETONES	1-8270 2-BN 3-PAHS	1-PCBS 2-PEST (608/8080)	1-IR(418.1) 2-OIL/GREASE	1-1R(418.1) 2-OIL/GREASE	1-PH 2-FLASH 3-REACT	
AA 14891	FFIP	8/12	-	1	G	12	1				1-601/8010 2-602/8020	1-502/8021 2-524	1-624/8240 2-8260	1-MTBE 2-KETONES	1-8270 2-BN 3-PAHS	1-PCBS 2-PEST (608/8080)	1-IR(418.1) 2-OIL/GREASE	1-1R(418.1) 2-OIL/GREASE	1-PH 2-FLASH 3-REACT	

RELINQUISHED BY: <u>[Signature]</u>	RECEIVED BY: <u>[Signature]</u>	DATE: <u>8-13-98</u>	TIME: <u>12:15</u>
		DATE: <u>8-13-98</u>	TIME: <u>2:30</u>

SPECIAL INSTRUCTIONS: Please report 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and naphthalene. Amber liter is 100.3 per Pak.

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: _____