(1941)

Forcier Aldrich & Associates, Inc.
Consulting Engineers

FA&A

July 9, 1996

Mr. Richard Spiece
State of Vermont
Agency of Natural Resources
Hazardous Materials Management Division
103 South Main Street/West Building
Waterbury, Vermont 05671-0404

JUL 15 11 53 AM '96

RE: RI/FS Summary Report
Petroleum Contamination at the Fanny Allen Campus - FAHC
(Site #96-1941)
FA&A Project No. 96001

Dear Richard:

On behalf of Fletcher Allen Health Care (FAHC), we are submitting this Remedial Investigation/Feasisibility Study (RI/FS) Summary Report to determine the degree and extend of petroleum contamination encountered during the removal and replacement of an underground fuel oil tank at the Fanny Allen Campus - FAHC. This investigation is summarized in the following and attached documentation:

INTRODUCTION

This report is written to summarize the investigation activities conducted at the Fanny Allen Campus -FAHC in Colchester, Vermont. See Figure No. 1 in Attachment No.1 for a location map. The additional investigative work was requested by the State of Vermont, Agency of Natural Resources, Hazardous Materials Division, Sites Management Section (SMS) as a result of the detection of petroleum contaminated soils during the removal and replacement of a #2 fuel oil, underground storage tank (UST).

Forcier Aldrich & Associates, INC. (FA&A). was retained by FAHC to conduct the additional investigative activities. FA&A subcontracted a portion of this work to Griffin International.

BACKGROUND

A 6,000 gallon, #2 fuel oil, underground storage tank (UST) was removed from the Fanny Allen Campus during the period from October 4-6, 1995 as part of an UST replacement project. Forcier Aldrich & Associates, Inc. (FA&A) conducted an initial site assessment as part of the tank removal. The site assessment was conducted to address the impacts of any contamination present. This assessment confirmed the discovery of petroleum contamination to soil and groundwater.

An Initial Site Assessment Report, dated October 6, 1995, prepared by FA&A summarized the degree and extent of contamination encountered during the tank removal. The contaminated soils were in a ½ to 1 foot layer directly above the concrete pad upon which the UST had been set. The area of contamination was above the pad and along the eastern and northern sides of the excavation. There was no contamination detected along the southern and western sides of the excavation. Groundwater was discovered at approximately 14 feet below ground. No free product was found to be present. Soils were screened for volatile organic compounds (VOC's) with a photo

7 Park Avenue Williston, VT 05495 Phone: 802-879-7733 Fax: 802-879-1742

ionization detector (PID). The peak VOC concentration observed was 140 ppm. Contaminated soils were segregated from clean soils and temporarily polyencapsulated. A total of 15 cubic yards of contaminated soils were removed. This material was transported to Continental Paving in Londonderry, NH for disposal.

The SMS issued a letter on January 8, 1996 which determined that additional work was necessary at the site to determine the severity of contamination present. On January 12, 1996, FA&A submitted a work plan to conduct the additional work outlined in the January 8th SMS letter. On February 14, 1996, the SMS approved the work plan.

SITE DESCRIPTION

A location map of the general area is provided as Figure No. 1 in Attachment No. 1. A more detailed site plan of the UST area is provided as Figure No. 2 in Attachment No. 1. A more detailed site description is provided in the Griffin International Report provided in Attachment No. 2.

SCOPE OF WORK

The investigation activities included as part of this additional work included the following:

- Drilling of four (4) soil borings to define the degree and extent of contamination to the soil. Split spoon samples were taken of the soil from the borehole and screened with a calibrated photo-ionization device (PID) for total volatile organic compounds (VOC's)
- Installation of four (4) monitoring wells in the same borehole as the soil borings.
- Surveying of wells for elevation and location.
- Determination of groundwater elevation and flow direction.
- Groundwater sampling and analysis was conducted to determine the degree and extent of groundwater contamination, if any. Groundwater samples collected from each of the four (4) wells were analyzed by EPA Method 602 (benzene, toluene, ethyl benzene, xylene (BTEX) and methyl teriary butyl ether (MTBE), and by EPA Method 418.1 for Total Petroleum Hydrocarbons (TPH).
- Receptor Assessment
- Summary report detailing the results of the above work. The report also includes a location map, site and groundwater contour map, well logs, water level readings, PID readings, analytical results, receptor assessment, conclusions and recommendations.

RESULTS OF INVESTIGATION ACTIVITIES

Activities Conducted by Griffin International

The results of all activities conducted by Griffin International are included in the summary report by Griffin International provided as Attachment No. 2. These activities include the following:

- Soil borings and PID field screening
- Monitoring well installation
- Groundwater sampling and analysis
- Preliminary Receptor Survey and Risk Assessment
- Conclusions

Groundwater Elevation and Flow Direction

On June 6, 1996, Griffin measured the depth to groundwater in the four on-site monitoring wells as shown in Attachment No. 2. The wells were surveyed by FA&A to determine location and top of casing elevation. Groundwater elevations developed from this information is provided in the table below.

Table No. 1
Groundwater Elevations

Well ID	Elevation TOC[1] (ft)	Depth to Groundwater from TOC (ft)	Groundwater Elevation (ft)
MW-1	99.7	18.69	81.0
MW-2	91.0	7.2	83.8
MW-3	95.7	13.36	82.3
MW-4	88.5	3.82	84.7

[1] TOC- Top of Casing

Groundwater elevation data presented above was used to construct the groundwater contour map provided as Figure No. 2 in Attachment No. 1. As shown on this map groundwater appears to flow in a southern direction towards the Winooski River.

Results Summary of Groundwater Analytical Results

A summary of the analytical results of groundwater samples from MW-1, 2, 3 and 4 collected by Griffin on June 6, 1996 and analyzed by Endyne are presented in the table on the following page.

Table No. 2
Summary of Groundwater Analytical Results

Parameter	Well ID/Result (ug/L Unless Noted)			
	MW-1	MW-2	MW-3	MW-4
Benzene	TBQ[1]	TBQ	ND[2]	ND
Chlorobenzene	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Xylene	ND	ND	ND	ND
MTBE	ND	ND	ND	ND
TPH (mg/l)	2.5	TBQ	ND	1

1 Trace below quantitation limit
2 None detected

RECEPTOR ASSESSMENT

Based on the results of the soil PID screening and groundwater analytical results, it appears that basements of adjacent buildings are not at risk from contamination. The nearest surface water to the site is the Winooski River located approximately 2,250 feet to the south. Based on the results of the soil PID screening, the results of the groundwater analysis and the distance to the nearest surface water, it does not appear that any nearby waters are impacted from the site. There are no private or public drinking water wells within the vicinity of the site. The area is served by municipal water through the Champlain Water District.

CONCLUSIONS

Conclusions are presented in the Griffin International Report provided in Attachment No. 2.

RECOMMENDATIONS

Based on the Receptor Assessment and Conclusions above, it is recommended that no further work is needed at the site. It is also recommended that the site be removed from the active petroleum sites list in accordance with the SMAC activity complete parameters.

Please do not hestitate to call our office if you have any questions.

Sincerely,

Forcier Aldrich & Associates, Inc.

Kevin J. Camara
Civil/Environmental Designer

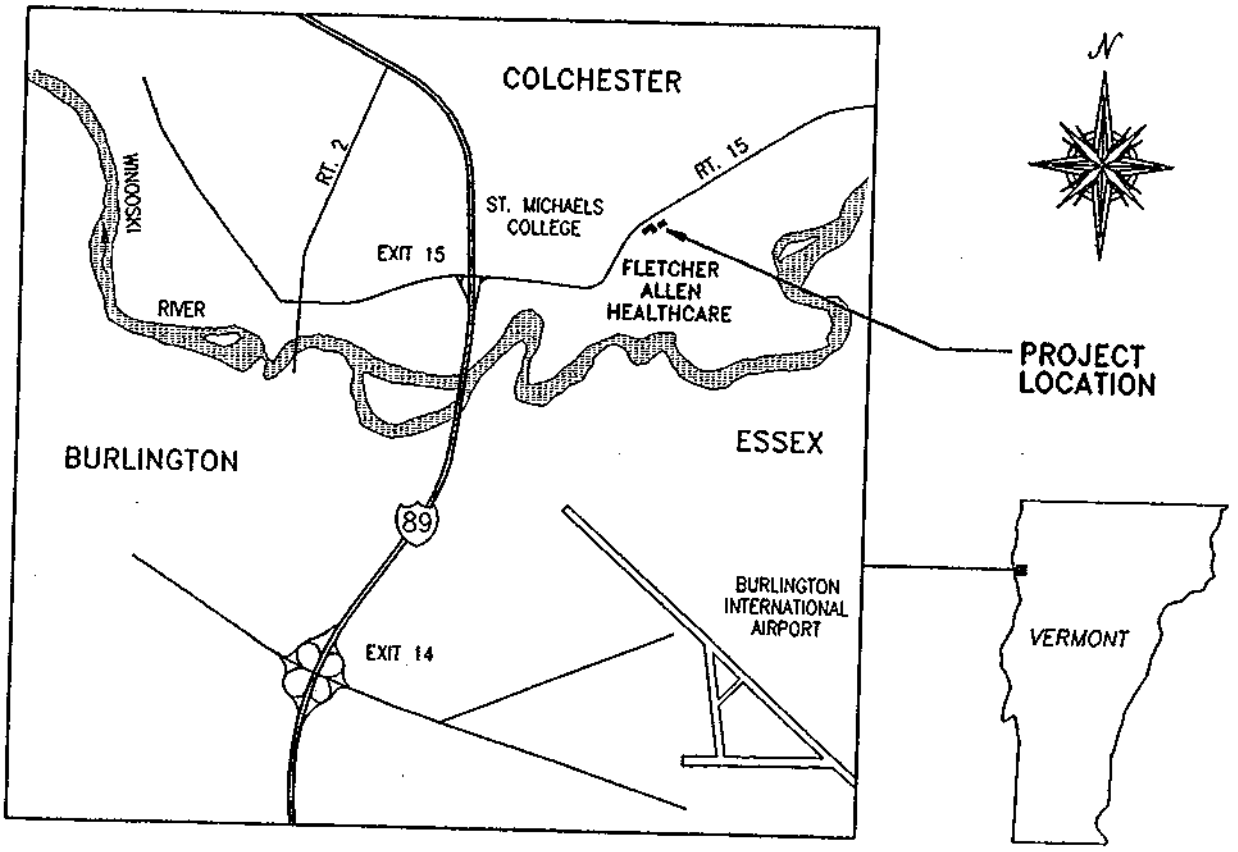
Bradley F. Aldrich, P.E.
Project Manager/Vice President

cc: Mr. David Keelty, FAHC
Mr. Peter Hack, Griffin International

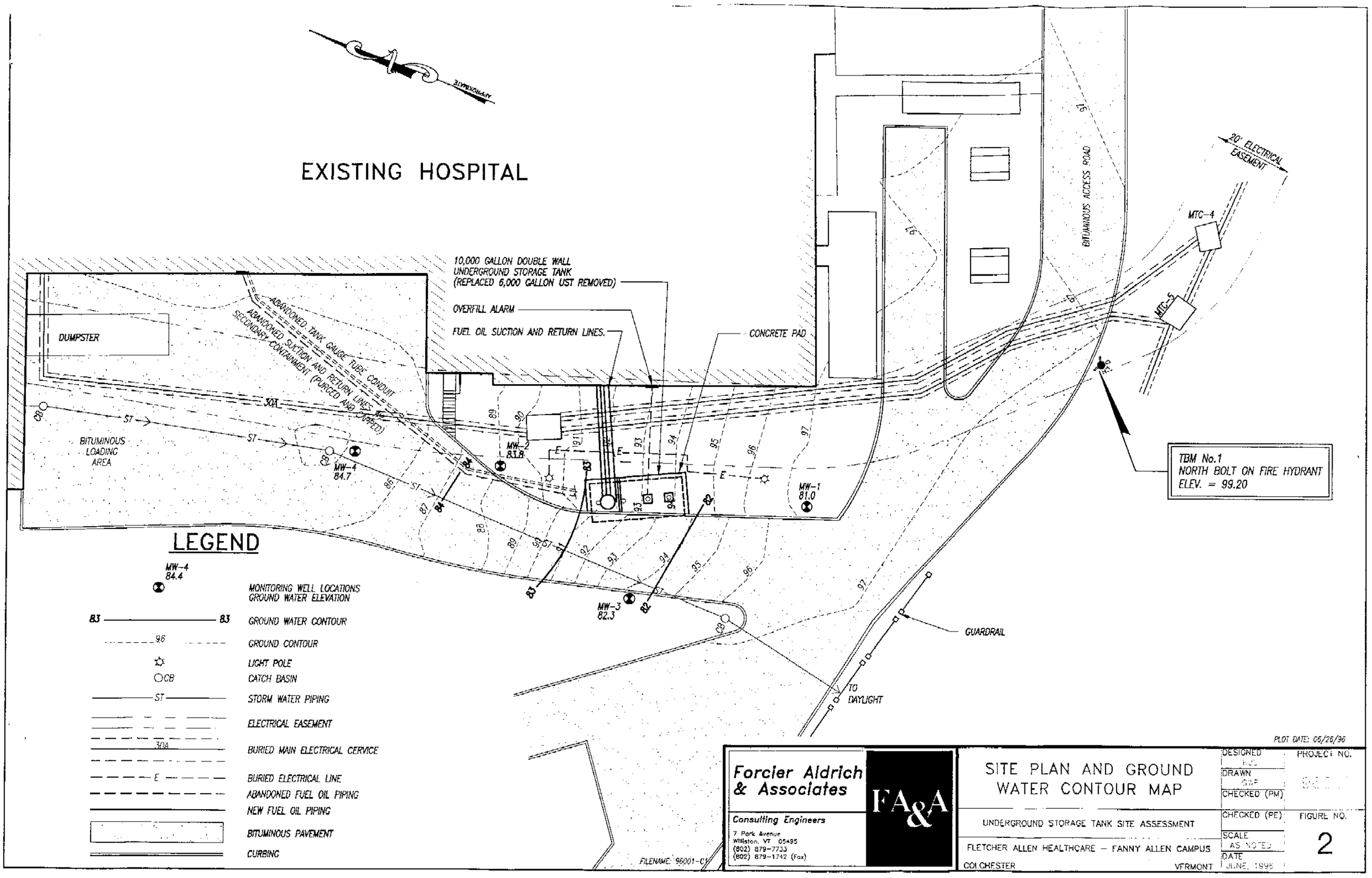
Attachments

ATTACHMENT NO. 1

FIGURES



Forcier Aldrich & Associates Consulting Engineers 7 Park Avenue Williston, VT 05495 (802) 879-7733 (802) 879-1742 (fax)	LOCATION MAP	DESIGNED KJC DRAWN TJD CHECKED (PM)	PROJECT NO. 96001
	REMEDIAL INVESTIGATION/FEASABILITY STUDY (RI/FS)	CHECKED (PE)	FIGURE NO. 1
	FLETCHER ALLEN HEALTHCARE - FANNY ALLEN CAMPUS COLCHESTER VERMONT	SCALE NONE DATE JAN. 1996	



PLOT DATE: 06/26/96

Forcier Aldrich & Associates
Consulting Engineers
7 Park Avenue
Williston, VT 05495
(802) 879-7733
(802) 879-1742 (Fax)
FA&A

FILENAME: 96001-C1

SITE PLAN AND GROUND WATER CONTOUR MAP

UNDERGROUND STORAGE TANK SITE ASSESSMENT

FLETCHER ALLEN HEALTHCARE – FANNY ALLEN CAMPUS

COLCHESTER VERMONT

DESIGNED: [illegible]
DRAWN: GMF
CHECKED (PM):
CHECKED (PE):
SCALE: AS NOTED
DATE: JUNE, 1996
PROJECT NO.: [illegible]
FIGURE NO.: 2

ATTACHMENT NO. 2

GRIFFIN INTERNATIONAL REPORT

SITE ASSESSMENT REPORT

For

FLETCHER ALLEN HEALTH CARE
FANNY ALLEN CAMPUS
COLCHESTER, VERMONT

JUNE 1996

Prepared for:

Forcier Aldrich and Associates
7 Park Avenue
Williston, VT 05495

Prepared By:

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

TABLE OF CONTENTS

I. INTRODUCTION

This report details the site assessment conducted by Griffin International Inc. (Griffin) at the Fletcher Allen Health Care Fanny Allen Campus (FAHC) after the routine removal of one 6000 gallon underground storage tank (UST). A formal Tank Closure Inspection Report was prepared by Forcier Aldrich and Associates (FAA), and submitted to the VTDEC on October 6, 1995. The old UST was replaced with a new 10,000 gallon fuel oil UST which was installed in the same pit.

During the tank closure, subsurface petroleum contamination was detected in the soils at one end of the UST pit, and groundwater was also observed in the excavation. Fifteen yards of contaminated soils were removed from the excavation and polyencapsulated on site.

Due to the detection of elevated concentrations of VOCs in the soil, FAA subcontracted Griffin to coordinate and install four groundwater monitoring wells and collected groundwater samples for laboratory analysis to further define the extent and degree of subsurface contamination at this site. This Site Assessment Report has been prepared for FAA in compliance with VTDEC guidelines to assess the risk posed to local receptors, and includes general conclusions. Final conclusions and recommendations for this project are to be provided by FAA.

II. SITE DESCRIPTION

The Fletcher Allen Health Care Fanny Allen Campus is located on U.S. Route 15, 111 College Parkway, in Colchester, Vermont. This area is a commercial and residential district, with several commercial and residential establishments located in the vicinity. This area are served by municipal water and sewer. Surface water in the vicinity of the UST is collected by catch basins, which discharge into a steep ravine approximately one hundred feet south of the UST area.

The topography surrounding the FAHC is predominantly level, and a steep ravine is located on the southeast side of the property. In the vicinity of the UST, the topography slopes down a man-made embankment to the loading dock and lower level access for the FAHC building. The subsurface material encountered during this investigation consisted of very fine sands and silt.

III. MONITORING WELL INSTALLATION

Four groundwater monitoring wells were installed on May 31, 1996, by Green Mountain Boring of Barre, Vermont. A Griffin engineer supervised the boring and installation of the wells.

The wells were installed with a 4.25 inch diameter hollow stem auger drill rig, and are constructed with ten feet of 2 inch diameter, factory slotted PVC well screen installed with five feet extending into the water table. A 2 inch diameter solid PVC riser pipe extends from the screened section to just below the ground surface. The annulus between the well screen and the borehole wall is filled with a silica sandpack to facilitate groundwater flow into the well. A

bentonite plug is installed on top of the sandpack and the remainder of the annulus is filled with native materials. The wells are completed with a locking cap and a flush mounted, steel, protective access cover.

At first, continuous soil samples were collected from the boreholes with a split spoon sampler. However, due to the consistent soil types and no detection of contamination in the upper portions of the boreholes, soil samples were subsequently collected from the upper portions of the boreholes at five foot intervals, and sampling increased to continuous as the depth increased. All soil samples were field screened with a calibrated HNU photo-ionization device (PID) which detects volatile organic compounds (VOCs). The Boring Logs in Appendix A indicate the sampling intervals, soil types and PID readings observed in each borehole.

Monitoring well MW1 was installed on the eastern side of the UST pit to determine the extent of contamination in the assumed upgradient (background) area. This boring was advanced through very fine sand and silt to approximately 30 feet below grade. Soil samples collected from this borehole did not have any noticeable petroleum odors, and no VOCs were detected with the PID. Groundwater was detected at approximately 20 feet below grade.

MW2 was installed on the southwest side of the UST pit. During the installation of MW2, no petroleum odors were encountered, and no VOCs were detected in the sand and silt soil samples collected from this borehole. Groundwater was encountered at approximately 12 feet below grade, and the bottom of the well was placed at 18 feet below grade.

MW3 was installed southeast of the tank pit to determine the extent of contamination in this vicinity. The fine sands and silt encountered in this borehole did not contain any noticeable odors or VOC concentrations as measured by PID. The water table was measured at 18 feet below grade, and the bottom of the well is at 25 feet.

MW4 was installed on the west side of the UST area. No odors or VOCs were detected in the fine sand and silt encountered in this borehole. Groundwater was detected at 5 feet below grade and the bottom of this well is at 13 feet below grade.

IV. WATER SAMPLING AND ANALYSIS

On June 6, 1996, Griffin attempted to collect water samples from the storm drain system in the vicinity of the UST. However, the catch basin cover located near MW4 could not be opened, and no water flow was present in the next downgradient manhole or at the outfall into the ravine. Therefore, no water samples were collected from the storm drain system.

On June 6, 1996, Griffin measured the depth to groundwater in the four on-site monitoring wells prior to collecting groundwater samples from the wells. The measured depths to water in MW1, MW2, MW3, and MW4 were 18.69', 7.2', 13.36', and 3.82', respectively. These data will be

utilized by FAA in conjunction with their site survey to calculate the relative groundwater flow direction and gradient.

Also, Griffin used a Photovac Microtip PID to screen the ambient air inside each well riser immediately after removing the well caps, and no VOCs were detected in any well. During the sample collection, no odors or sheens were detected in the groundwater samples. The water samples were analyzed by EPA Method 602, which tests for benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl tertiary butyl ether (MTBE), and by EPA Method 418.1 for Total Petroleum Hydrocarbons (TPH).

The EPA Method 602 analysis of groundwater collected from MW1 detected a trace of benzene (< 1 ppb). The laboratory detection limit was 1 part per billion (ppb), and the Vermont Groundwater Enforcement Standard (VTGES) for benzene is 5 ppb.

The EPA Method 602 analysis of groundwater collected from MW2, MW3, and MW4 did not detect any BTEX or MTBE compounds.

The EPA Method 418.1 analysis of groundwater collected from MW1 detected 2.5 parts per million (ppm) of TPH.

The EPA Method 418.1 analysis of groundwater collected from MW2 detected a trace of TPH.

The EPA Method 418.1 analysis of groundwater collected from MW3 did not detect any TPH.

The EPA Method 418.1 analysis of groundwater collected from MW4 detected 1.0 parts per million (ppm) of TPH.

The laboratory method detection limit for TPH was 0.8 ppm.

The analytical results from the trip blank, equipment blank and duplicate samples indicate that proper quality control was maintained during collection, transportation, and analysis of the samples. The analytical laboratory results are attached in Appendix B.

V. RECEPTOR SURVEY AND RISK ASSESSMENT

During the drilling activities, Griffin visually inspected the area for potential sensitive receptors such as buildings, wetlands, surface waters, supply wells, and other environmentally sensitive areas. Potential receptors identified during this investigation include the adjacent building basement, and the storm drain system that discharges to the ravine. The area is served by municipal water and sewer systems. No other potential receptors were observed.

Based on the lack of significant petroleum contamination detected in the soils and groundwater immediately outside of the UST pit, the identified potential receptors are not likely at risk of

impact. However, the actual groundwater flow direction is not known at this time, and will have an effect on the potential for contamination migration.

VI. CONCLUSIONS

1) There has been a release of petroleum to the subsurface in the vicinity of the former fuel oil UST at FAHC. The amount and duration of the release are not known, but it most likely originated from the former fuel oil UST system, which was replaced and upgraded in October, 1995.

2) Soils in the original UST pit contained elevated VOC concentrations as measured with a PID during the tank replacement process. However, no adsorbed phase contamination was detected by PID in the soil samples collected during the installation of the four monitoring wells in the vicinity of the UST, and only a trace concentration of benzene and low TPH concentrations were detected in the groundwater samples collected from the wells.

3) Based on the low risk of impact to the identified potential receptors and the relatively low concentrations of dissolved phase contamination in the four on-site monitoring wells, the subsurface contamination detected at this site does not likely pose an immediate or serious threat to human health and safety or to the environment.

APPENDIX A

Well Logs

PROJECT FLETCHER ALLEN HEALTH CARE

LOCATION FANNY ALLEN CAMPUS

DATE DRILLED 5/31/96 TOTAL DEPTH OF HOLE 18.0'

DIAMETER 4.25"

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

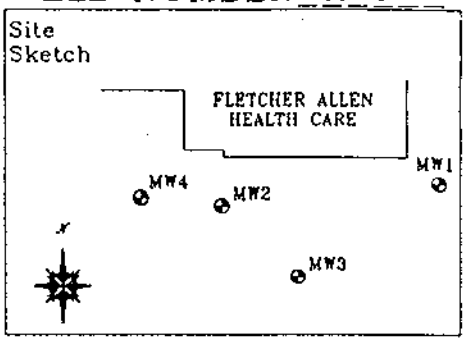
CASING DIA. 2" LENGTH 7.5' TYPE sch 40 pvc

DRILLING CO. GMB DRILLING METHOD HSA

DRILLER JAMIE LOG BY P. HACK

WELL NUMBER MW2

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE			0
1		NATIVE BACKFILL	1'-2' 0.2 ppm	Dark brown fine SAND, trace of silt, loose, no odor, damp	1
2					2
3		BENTONITE			3
4					4
5					5
6		WELL RISER	5'-7'- 5/7/10/13 0 ppm	Damp, brown, coarse SAND to very fine SAND.	6
7					7
8			7'-9'-13/13/8/5 0 ppm	4" layer of wet, coarse, SAND to wet, gray SILT.	8
9		SAND PACK			9
10			9'-11'- 5/8/10/13 0 ppm	2" layer of damp, coarse SAND to damp, gray, SILT.	10
11					11
12		WELL SCREEN	11'-13'- 10/15/25/35 0 ppm	12.0' WATER TABLE	12
13				6" layer of wet, coarse SAND to very fine SAND and SILT.	13
14			13'-15'-9/10/11/13	Wet, coarse, SAND, to wet, gray, very fine SAND and SILT.	14
15					15
16			15'-17'- 6/7/8 0.1 ppm	Wet, brown, very fine SAND.	16
17		BOTTOM CAP			17
18					18
19		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 18.0' END OF EXPLORATION AT 18.0'	19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT FLETCHER ALLEN HEALTH CARE

LOCATION FANNY ALLEN CAMPUS

DATE DRILLED 5/31/96 TOTAL DEPTH OF HOLE 25.0'

DIAMETER 4.25"

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

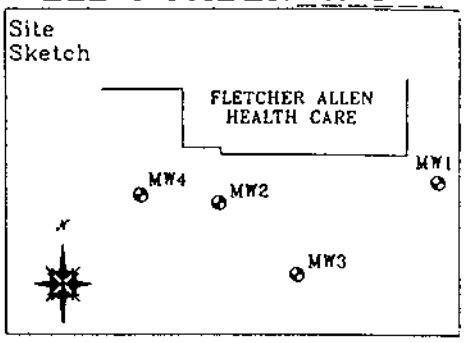
CASING DIA. 2" LENGTH 14.5' TYPE sch 40 pvc

DRILLING CO. GMB DRILLING METHOD HSA

DRILLER JAMIE LOG BY P. HACK

WELL NUMBER MW3

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX			0
		LOCKING WELL CAP			
		CONCRETE			
1					1
2				Damp, brown SAND and SILT.	2
3					3
4		NATIVE BACKFILL			4
5					5
6			5'-7'- 5/9/13/25 0 ppm	4" layer of TOPSOIL and SILT to light brown, coarse SAND and STONES.	6
7					7
8		WELL RISER	7'-9'- 20/25/30/35 0 ppm	6" layer of brown, dry, SAND and STONES to light brown, damp, dense very fine SAND.	8
9					9
10			9'-11'- 5/23/40/37 0 ppm	Light brown, damp, very fine SAND to SILT.	10
11					11
12		BENTONITE	11'-13'- 34/32/22/21	Light brown, damp, very fine SAND and SILT, trace clay at 13.0'.	12
13					13
14			13'-15'- 13/15/18/23 0 ppm	Light brown, damp SILT.	14
15					15
16		SAND PACK	15'-17'- 4/6/19/27 0 ppm	Damp, brown SILT.	16
17					17
18			17'-19'- 15/22/27/34 0 ppm	18.0' WATER TABLE ▼	18
19		WELL SCREEN		Wet SILT and very fine SAND.	19
20			19'-21'- 13/15/52/63 0.1 ppm	Wet, very fine SAND and SILT.	20
21					21
22			21'-23'- 18/36/50/67	Wet, very fine SAND and SILT.	22
23					23
24		BOTTOM CAP		BASE OF WELL AT 25.0' END OF EXPLORATION AT 25.0'	24
25		UNDISTURBED NATIVE SOIL			25

PROJECT FLETCHER ALLEN HEALTH CARE

LOCATION FANNY ALLEN CAMPUS

DATE DRILLED 5/31/96 TOTAL DEPTH OF HOLE 15.0'

DIAMETER 4.25"

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

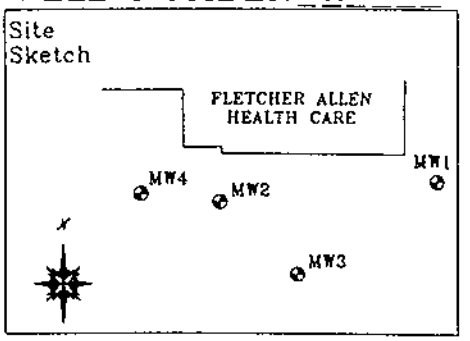
CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc

DRILLING CO. GMB DRILLING METHOD HSA

DRILLER JAMIE LOG BY P. HACK

WELL NUMBER MW4

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE BENTONITE			0
1				Pavement and stones to brown, dry, medium SAND.	1
2		WELL RISER			2
3					3
4					4
5				5.0' WATER TABLE ▼	5
6		SAND PACK	5'-7'- 1/2/4/3 0 ppm	Wet, gray, GRAVEL, stones, asphalt, to wet, brown SAND.	6
7					7
8			7'-9'- 10/12/18/18 0 ppm	Wet, coarse SAND.	8
9		WELL SCREEN			9
10			9'-11'- 13/13/20/25 0.1 ppm	Wet, light brown/gray very fine SAND to SILT, some dark brown spot stains.	10
11					11
12		BOTTOM CAP	11'-13'- 17/14/20/25 0.1 ppm	Wet, brown, very fine SAND and SILT.	12
13					13
14			13'-15'- 0/0/2/3 0.1 ppm	Wet, brown, very fine SAND and SILT.	14
15		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 13.0' END OF EXPLORATION AT 15.0'	15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

APPENDIX B

Analytical Laboratory Results

ENDYNE, INC.

Laboratory Services

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

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
DATE REPORTED: June 11, 1996
DATE SAMPLED: June 6, 1996

PROJECT CODE: GIFA1997
REF. #: 89,919 - 89,924

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

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

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

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

TOTAL HYDROCARBONS - EPA METHOD 418.1 (WATER)

CLIENT: Griffin International
REPORT DATE: June 11, 1996
PROJECT NAME: Fanny Allen
PROJECT CODE: GIFA1997
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE EXTRACTED: June 7, 1996
DATE ANALYZED: June 7, 1996
SAMPLER: R. Higgins

Reference #	Sample ID	Conc.(mg/L)[1]
89,919	Trip Blank; 7:48	ND[2]
89,920	MW1; 1:34	2.5
89,921	Duplicate MW1; 1:34	1.1
89,922	MW3; 2:03	ND
89,923	MW2; 2:28	TBQ[3]
89,924	MW4; 2:55	1.0

Notes:

1 Method detection limit is 0.8 ppm.
2 None Detected
3 Trace below quantitation limit

ENDYNE, INC.

Laboratory Services

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

EPA METHOD 418 (WATER) LABORATORY REPORT

MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE EXTRACTED: June 7, 1996

PROJECT CODE: GIFA1997
REF.#: 89,924
STATION:MW4
TIME SAMPLED: 2:55
SAMPLER: R. Higgins
ANALYSIS DATE: June 6, 1996

Parameter	Sample(mg/L)	Spike(mg/L)	Dup 1(mg/L)	Dup 2(mg/L)	Avg % Recovery
Total Petroleum Hydrocarbons	1.0	10	9.1	9.3	82.

ENDYNE, INC.

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

16862

CHAIN-OF-CUSTODY RECORD

RECEIVED JUN 12 1996

Project Name: Fanny Allen Site Location: Wiosti VT	Reporting Address: Glenn	Billing Address:
Endyne Project Number: GIFA 1997	Company: Contact Name/Phone #: P Hall	Sampler Name: R. Higgins Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 6/6/96	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
89919	TRIP BLANK	H2O	✓		7:45	2	1L G		418.1	HCl	
89920	MW1				1:34						
89921	DUPLICATE MW1				1:34						
89922	MW 3				2:03						
89923	MW 2				2:29						
89924	MW4				2:55						

Relinquished by: Signature	Received by: Signature	Date/Time 6/6/96 3:22 P.M.
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

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546483.5

16862

CHAIN-OF-CUSTODY RECORD

Project Name: FMM/ FIKE Site Location: Wind. VT	Reporting Address: CCIEN	Billing Address:
Endyne Project Number:	Company: Contact Name/Phone #: PIKE	Sampler Name: Phone #: K. Hawkins

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 6/6/96	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	TRIP BLANK	H2O	✓		7:45	2	1L G		418.1	HCl	
	MW1				1:54						
	DUPLICATE MW1				1:54						
	MW				2:03						
	MW2				2:20						
	MW4				2:11						

Relinquished by: Signature	Received by: Signature	Date/Time 6/6/96 3:22 PM
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

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REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996

PROJECT CODE: GIFA1998
REF.#: 89,925 - 89,930

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

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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE ANALYZED: June 10, 1996

PROJECT CODE: GIFA1998
REF.#: 89,925
STATION: Trip Blank
TIME SAMPLED: 7:48
SAMPLER: R. Higgins

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 114%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE ANALYZED: June 10, 1996

PROJECT CODE: GIFA1998
REF.#: 89,926
STATION: MW1
TIME SAMPLED: 1:34
SAMPLER: R. Higgins

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	TBQ[1]
Chlorobenzene	1	ND[2]
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 120%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 Trace below quantitation limit

2 None detected

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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE ANALYZED: June 10, 1996

PROJECT CODE: GIFA1998
REF.#: 89,927
STATION: Dup to MW1
TIME SAMPLED: 1:34
SAMPLER: R. Higgins

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	TBQ[1]
Chlorobenzene	1	ND[2]
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 116%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 Trace below quantitation limit

2 None detected

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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE ANALYZED: June 10, 1996

PROJECT CODE: GIFA1998
REF.#: 89,928
STATION: MW3
TIME SAMPLED: 2:03
SAMPLER: R. Higgins

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 120%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE ANALYZED: June 10, 1996

PROJECT CODE: GIFA1998
REF.#: 89,929
STATION: MW2
TIME SAMPLED: 2:28
SAMPLER: R. Higgins

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 118%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

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LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE ANALYZED: June 10, 1996

PROJECT CODE: GIFA1998
REF.#: 89,930
STATION: MW4
TIME SAMPLED: 2:55
SAMPLER: R. Higgins

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 120%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

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EPA METHOD 602 LABORATORY REPORT

MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: Griffin International
PROJECT NAME: Fanny Allen
REPORT DATE: June 11, 1996
DATE SAMPLED: June 6, 1996
DATE RECEIVED: June 6, 1996
DATE ANALYZED: June 10, 1996

PROJECT CODE: GIFA1998
REF.#: 89,928
STATION: MW3
TIME SAMPLED: 2:03
SAMPLER: R. Higgins

Parameter	Sample(ug/L)	Spike(ug/L)	Dup1(ug/L)	Dup2(ug/L)	Avg % Rec
Benzene	ND[1]	10	10.6	10.4	105%
Toluene	ND	10	10.2	10.1	101%
Ethylbenzene	ND	10	9.9	9.8	98%
Xylenes	ND	30	29.6	29.0	98%

NOTES:
1 None detected

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16861

CHAIN-OF-CUSTODY RECORD

RECEIVED JUN 12 1996

Project Name: Family Affair Site Location: Winooski VT	Reporting Address: GRIFFIN	Billing Address:
Endyne Project Number: GIFA 1998	Company: Contact Name/Phone #: P. Hack	Sampler Name: R. Higgins Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 6/6/96	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
8925	TRIP BLANK	H2O	✓		7:45	2	40mL G		602	HCl	
8926	MW1	"	"		1:34	"	"		"	"	
8927	Dup to MW1	"	"		1:34	"	"		"	"	
8928	MW3	"	"		2:05	"	"		"	"	
8929	MW2	"	"		2:29	"	"		"	"	
8930	MW4	"	"		2:55	"	"		"	"	

Relinquished by: Signature	Received by: Signature	Date/Time 6/6/96 3:22 PM
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

ENDYNE, INC.

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16861

CHAIN-OF-CUSTODY RECORD

Project Name: Finch Pfleg Site Location: Winooski VT	Reporting Address: GRIFFIN	Billing Address:
Endyne Project Number:	Company: Contact Name/Phone #: P. Hack	Sampler Name: K. Higgins Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 6/6/96	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	TRIP BLANK	H2O	✓		7:45	2	HCL		602	HCL	
	MW1				1:34						
	DUP TO MW1				1:34						
	MW3				2:03						
	MW2				2:23						
	MW4	↓	↓		2:55	↓	↓		↓	↓	

Relinquished by: Signature	Received by: Signature	Date/Time 6/6/96 5:20 PM
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ____ No ____

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										