AUG 23 1993

GRIFFIN INTERNATIONAL INC

August 20, 1993

Mr. Yasin Faour
Sunny Hollow Quick Stop
97 Roosevelt Highway
Colchester, VT 05446

RE: investigation of subsurface petroleum contamination,
Sunny Hollow Quick Stop, Colchester, Vermont 91-1062

Dear Yasin,

Enclosed is the report on the investigation of subsurface petroleum contamination at the Sunny Hollow Quick Stop. Please call me with any questions that you may have.

Sincerely,

Peter M. Murray
Project Hydrogeologist

cc: Chuck Schwer, VTDEC

encl.

28 Dorset Lane • Williston, VT 05495 • 802 879-7708

REPORT ON THE INVESTIGATION OF SUBSURFACE PETROLEUM CONTAMINATION SUNNY HOLLOW QUICK STOP COLCHESTER, VERMONT

August, 1992

Prepared for:

Mr. Yasin Faour
Sunny Hollow Quick Stop

Prepared by:

Griffin International, Inc.
2B Dorset lane
Williston, Vermont
(802) 879-7708

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I. INTRODUCTION

This investigation of subsurface petroleum contamination at the Sunny Hollow Quick Stop (Sunny Hollow), in Colchester, Vermont, has been conducted by Griffin International, Inc. (Griffin), for Mr. Yasin Faour, owner of Sunny Hollow. The investigation has been conducted at the request of the State of Vermont Department of Environmental Conservation (VTDEC) to determine the extent and degree of subsurface petroleum contamination and to determine the risk that the contamination may pose to potential receptors. The request was contained in a letter to Mr. Faour, dated November 4, 1992.

Subsurface petroleum contamination was first detected at this site in June, 1991. The contamination was detected during a Phase II Environmental Risk Assessment of the property conducted by Griffin. Contamination was detected in one monitoring well, MW-1, which was installed during the assessment. Most, if not all, of the contamination was likely due to the failure of an underground gasoline storage tank (UST) approximately twenty years ago. The tank was reportedly removed at that time.

In May, 1993, five USTs were removed from Sunny Hollow. These USTs were installed in 1982 and were used to store gasoline, diesel and kerosene. Low concentrations of petroleum contamination were detected in the soils surrounding these USTs. None of the USTs appeared to be leaking. A report on the tank removal was prepared by Griffin and submitted to VTDEC.

II. INVESTIGATIVE PROCEDURES

A. Soil Sample Collection/Analysis

On July 6, 1993, Griffin drilled four soil borings in the vicinity of Sunny Hollow. The locations of the borings are shown on the Site Map, in Appendix A. The borings were drilled using a hand auger. Soil samples were collected from each boring at one foot intervals. The samples were screened for volatile organic compounds (VOCs) using a portable photo-ionization device (PID).

In addition to screening soil samples by PID, a sample from the water table in each borehole was collected for laboratory analysis. The soil samples from SB-1 and SB-2 were combined to form one composite sample. Samples from SB-3 and SB-4 were also combined to form one composite sample. The two composite samples were analyzed for benzene, toluene, ethylbenzene, xylenes and MTBE by EPA Method 602.

SB-1 was installed in a location which is assumed to be directly downgradient of MW-1. Groundwater at this site is estimated to flow northeast. Soils retrieved from this borehole from grade level to a depth of three feet consisted of dry, fine

sand. The sample collected from two feet contained a VOC concentration of 0.2 parts per million (ppm) VOCs. Soils from four feet to eight feet, the maximum depth of the borehole, consisted of dry to wet sand and gravel. The water table was estimated to be at a depth of seven feet. Soils at a depth of eight feet consisted of mostly clay. From four to six feet, the samples contained up to 0.2 ppm VOCs. The sample from seven feet contained 9.3 ppm VOCs. The clay sample from eight feet contained 7.1 ppm VOCs.

SB-2 was installed in a location that is assumed to be the most downgradient point on the property. Soils retrieved from this borehole from grade to three feet consisted of sand with some gravel. From three to six feet, the soils consisted of medium to coarse sand and gravel. From six feet to eight feet, the maximum depth of the boring, the soils consisted of wet silty clay. No VOCs were detected in any of the samples from this borehole.

SB-3 was installed across Route 7, in the assumed downgradient direction from Sunny Hollow. Soils from grade to three feet consisted of dry, fine sand. From three feet to seven feet, the soils consisted of dry, medium to coarse sand and gravel. From seven to nine feet, the soils consisted of moist, silty clay. The water table was not evident in this borehole, however, it was likely close to nine feet. No VOCs were detected in soils collected from this borehole.

SB-4 was also installed across Route 7 from Sunny Hollow. Soils collected from grade to three feet consisted of fine, dry sand. From three feet to five and a half feet, the soils consisted of dry, medium sand and gravel. From five and a half feet to nine feet, the soils consisted of wet, silty clay. The water table in the borehole was encountered at an approximate depth of five feet. No VOCs were detected in this borehole.

Laboratory analysis of the two composite soil samples indicated that no detectable concentrations of BTEX or MTBE were detected. Laboratory results are in Appendix B.

B. Groundwater Sampling and Analysis

During the July 6, 1993 site visit, Griffin collected a sample of groundwater from MW-1. The sample was collected according to Griffin's Groundwater Sampling Protocol. The sample was analyzed for BTEX and MTBE by EPA Method 602.

The analysis indicates that dissolved BTEX contamination remains in groundwater in the vicinity of MW-1. The total BTEX concentration, 4,541 parts per billion (ppb), represents a 78% reduction in total BTEX since the last sampling date, June 20, 1991. On that date, the total BTEX concentration was 20,392 ppb. MTBE was not detected in samples collected on either date. This

indicates that the source(s) of the contamination does not include gasoline manufactured after 1979. MTBE was first used as a gasoline additive in that year.

C. Indoor Air Screening

Griffin screened ambient air inside the Sunny Hollow building for VOCs on May 24, 1993. The screening is described in the tank pull report. No VOCs were detected at this time. Griffin had also planned to screen air inside a neighbor's house. According to Mr. Faour, the neighbors denied permission to screen ambient air inside their house, so no screening has been conducted to date.

III. RISK ASSESSMENT

Based on the information generated during the investigation of subsurface petroleum contamination at the Sunny Hollow Quick Stop, it is apparent that potential sensitive receptors of the contamination are not at risk of being impacted by the contamination.

All homes and businesses in the area appear to be served by the Champlain Water District, so there is little possibility that local water supplies could be impacted. No private water wells were observed on adjacent properties during the investigation.

The house immediately north of Sunny Hollow was reportedly impacted by petroleum vapors approximately twenty years ago, after a release from a UST. Although the ambient air inside this house has not been screened for VOCs, it is likely that the continued natural reduction in contamination concentrations has lowered the risk to this building. In addition, the risk of vapors impacting the Sunny Hollow building is low due to the gradual reduction in subsurface contamination concentrations.

The low lying, wet area, northeast of Sunny Hollow, across Route 7, does not appear to be at risk. Analysis of soil samples collected immediately upgradient of this area, downgradient of the former USTs and pumps at Sunny Hollow, indicated no detectable contamination concentrations.

Soils and groundwater in the vicinity of the former USTs at Sunny Hollow have been impacted. With the removal of the old USTs and installation of new, double walled USTs, additional risk to soils and groundwater from the storage and handling of petroleum products on this site are low.

IV. CONCLUSIONS

The following conclusions are based on the findings of this investigation and on the assessment of risks that subsurface petroleum contamination poses to potential receptors.

1. There have been releases of petroleum products to the subsurface at Sunny Hollow. The most significant release was likely the result of failure of a gasoline UST over twenty years ago. The release(s) resulted in contamination of soil and groundwater in the vicinity of the former USTs. Likely sources of petroleum releases to the subsurface, the former USTs, have been removed.

2. Analysis of groundwater from an on-site monitoring well indicates that dissolved BTEX contamination has migrated at least 30 feet downgradient of the former USTs. Contamination concentrations in the groundwater have decreased significantly, however, in a two year period.

3. Analysis of soil samples collected from four off-site soil borings indicates that significant concentrations of subsurface petroleum contamination have not migrated off-site.

4. The risks posed to potential receptors by residual subsurface petroleum contamination at Sunny Hollow are low. No significant impact has been reported since gasoline vapors were noticed in a house on the adjacent property over twenty years ago.

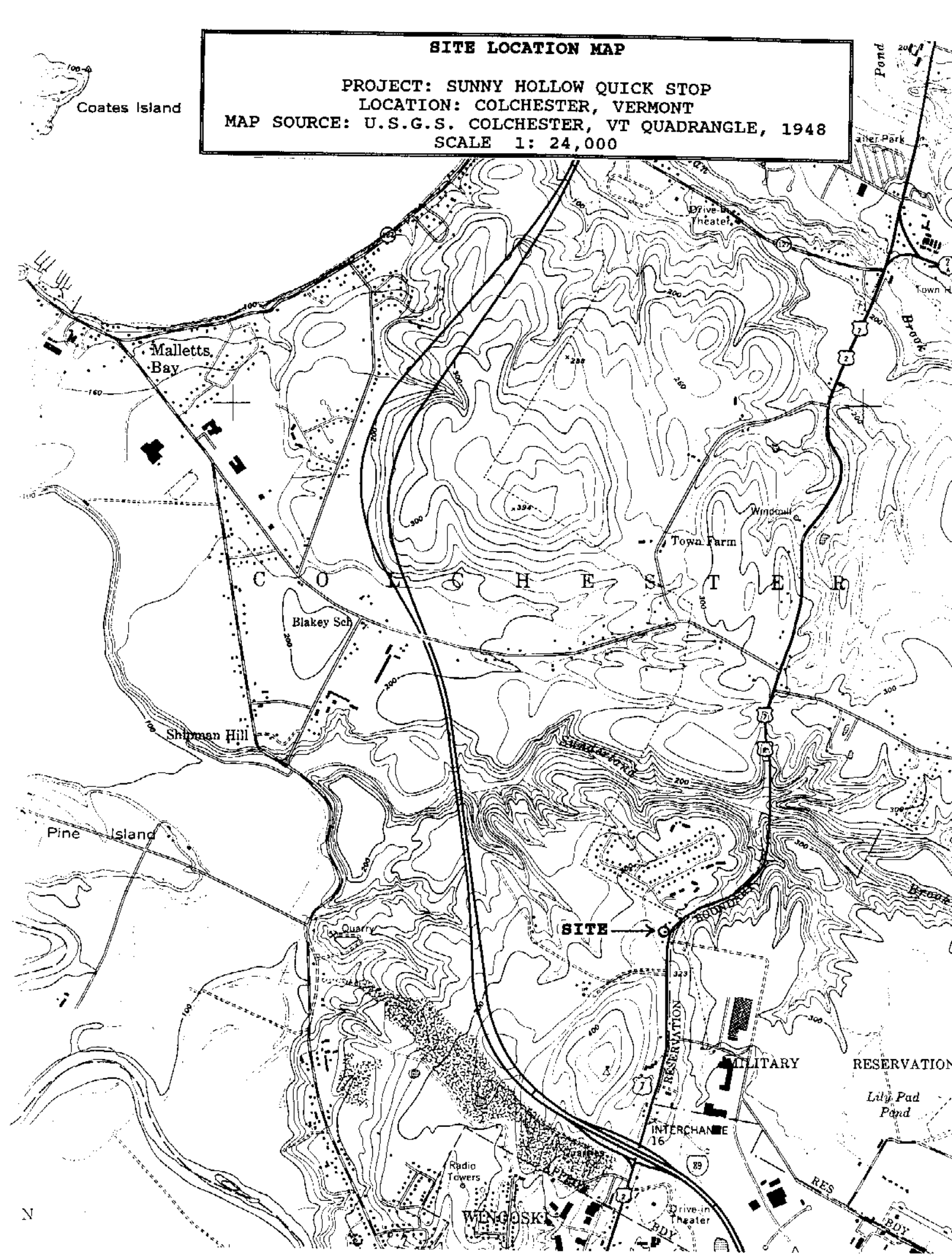
5. Over time, the natural processes of dilution, dispersion, volatilization and bio-degradation will result in a reduction of residual petroleum contamination at this site to below detectable concentrations.

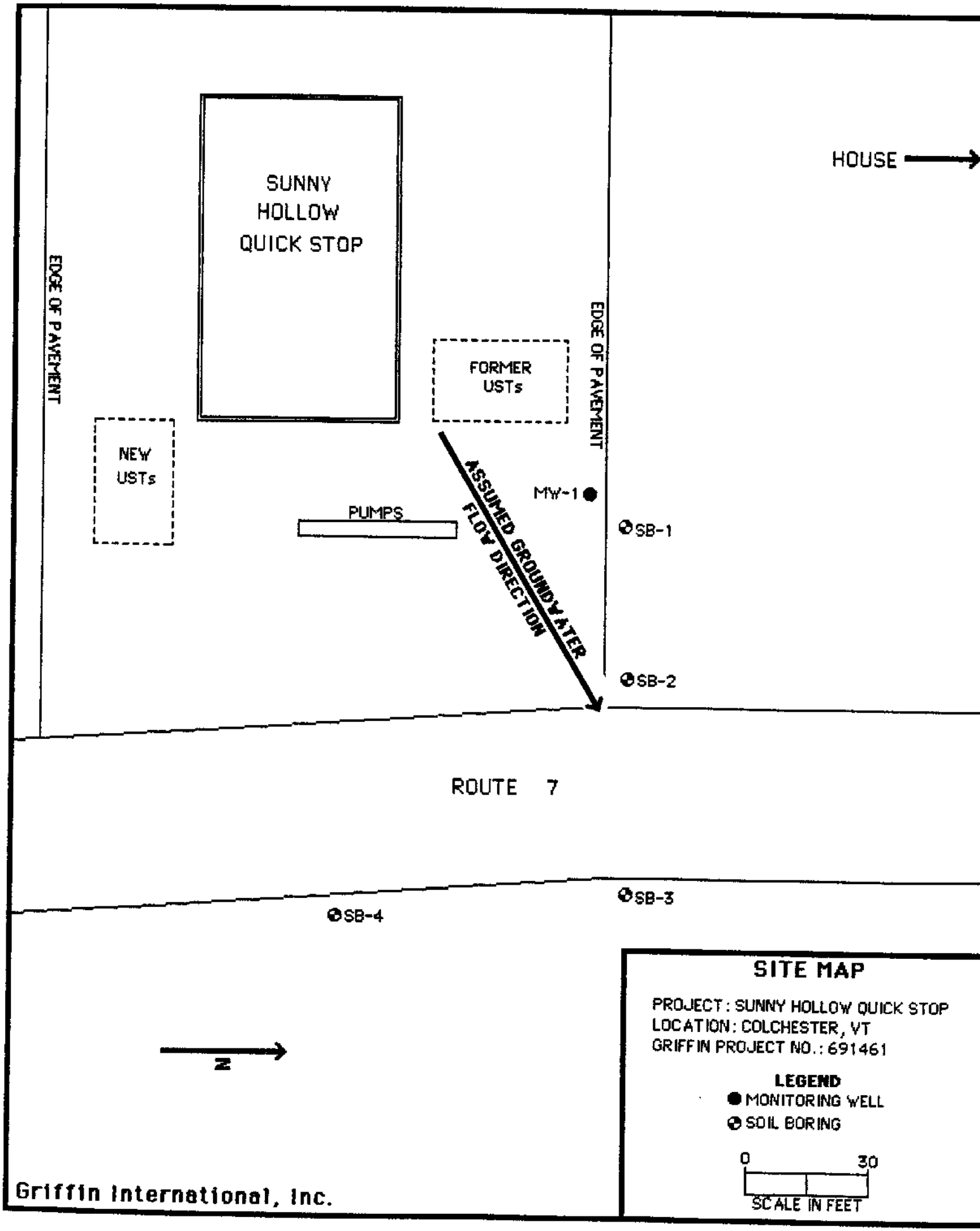
V. RECOMMENDATIONS

Based on the above conclusions, we recommend that no additional investigation be conducted at this site unless there are future, documented releases or impacts to sensitive receptors.

APPENDIX A

Site Maps


SITE LOCATION MAP
PROJECT: SUNNY HOLLOW QUICK STOP
LOCATION: COLCHESTER, VERMONT
MAP SOURCE: U.S.G.S. COLCHESTER, VT QUADRANGLE, 1948
SCALE 1: 24,000
Coates Island
Malletts Bay
Blakey Sch
Shipman Hill
Pine Island
Town Farm
Windmill
Drive-In Theater
Quarry
SITE
MILITARY RESERVATION
Lily Pad Pond
INTERCHANGE 16
Radio Towers
WINOOSKI
Drive-in Theater
N


SUNNY
HOLLOW
QUICK STOP
HOUSE
EDGE OF PAVEMENT
EDGE OF PAVEMENT
FORMER
USTs
NEW
USTs
ASSUMED GROUNDWATER
FLOW DIRECTION
MW-1
PUMPS
SB-1
SB-2
ROUTE 7
SB-3
SB-4
N
SITE MAP
PROJECT: SUNNY HOLLOW QUICK STOP
LOCATION: COLCHESTER, VT
GRIFFIN PROJECT NO.: 691461
LEGEND
MONITORING WELL
SOIL BORING
0
30
SCALE IN FEET
Griffin International, Inc.

APPENDIX B

Laboratory Results

ENDYNE, INC.

Laboratory Services

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

RECEIVED JUL 2 2 1993

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Sunny Hollow Quick Stop
REPORT DATE: July 21, 1993
DATE SAMPLED: July 6, 1993

PROJECT CODE: GISH1676
REF.#: 48,404

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated samples were preserved with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

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

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

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

Laboratory Services

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

RECEIVED JUL 2 2 1993

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Sunny Hollow Quick Stop
REPORT DATE: July 21, 1993
DATE SAMPLED: July 6, 1993
DATE RECEIVED: July 7, 1993
ANALYSIS DATE: July 15, 1993

PROJECT CODE: GISH1676
REF.#: 48,404
STATION: MW-1
TIME SAMPLED: 11:55
SAMPLER: J. Bernhard

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)	6/20/91
Benzene	50	101.	202
Chlorobenzene	50	ND[2]	ND
1,2-Dichlorobenzene	50	ND	ND
1,3-Dichlorobenzene	50	ND	ND
1,4-Dichlorobenzene	50	ND	ND
Ethylbenzene	50	220.	2,000
Toluene	50	90.9	1,490
Xylenes	50	4,130.	16,700
MTBE	500	ND	ND

Bromobenzene Surrogate Recovery: 118%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 20

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 2% dilution.

2 None detected

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ENDYNE, INC.

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

CHAIN-OF-CUSTODY RECORD

007703

Project Name: Sunny Hollow Quick Stop
Site Location: Colchester, VT

Endyne Project Number: GISH1676

Reporting Address: Griffin International, Inc.
28 Dorset Ln. Williston, VT 05495

Company: Griffin
Contact Name/Phone #: Peter Murray 879 7708

Billing Address: SAME

Sampler Name: Jack Bernhard
Phone #: 879 7708

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	SB-1 and SB-2 Composite	Soil		✓	7/6/93	1	250mL		8020		
	SB-3 and SB-4 Composite	Soil		✓	7/6/93	1	250mL		8020		
	MW-1	H_2O	✓		11:55	2	40mL		602	HCL	

Relinquished by: Signature: Peter Murray
Received by: Signature: Chris Field
Date/Time: 7/7/93 12:00 P.

Relinquished by: Signature: Chris Field
Received by: Signature: Tonia M. Chambers
Date/Time: 7/7/93 12:15 P.

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	Nitrate N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrite N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify)										

ENDYNE, INC.

Laboratory Services

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

RECEIVED JUL 2 2 1993

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Sunny Hollow Quick Stop
DATE REPORTED: July 20, 1993
DATE SAMPLED: July 6, 1993

PROJECT CODE: GISH1675
REF. #: 48,402 - 48,403

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

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.

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

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

ENDYNE, INC.

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Laboratory Services

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

LABORATORY REPORT

EPA METHOD 8020 -- COMPOUNDS BY EPA METHOD 8240

CLIENT: Griffin International
PROJECT NAME: Sunny Hollow Quick Stop
REPORT DATE: July 20, 1993
SAMPLER: J. Bernhard
DATE SAMPLED: July 6, 1993
DATE RECEIVED: July 7, 1993

PROJECT CODE: GISH1675
ANALYSIS DATE: July 15, 1993
STATION: SB-1 & SB-2 Composite
REF.#: 48,402
TIME SAMPLED: Not Indicated

Parameter	Detection Limit (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[2]
Chlorobenzene	20	ND
1,2-Dichlorobenzene	20	ND
1,3-Dichlorobenzene	20	ND
1,4-Dichlorobenzene	20	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	30	ND
MTBE	30	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

1,2 Dichloroethane-d4:	92.%
Toluene-d8:	101.%
4-Bromofluorobenzene:	91.%

PERCENT SOLIDS: 91.%

NOTES:

1 None detected

ENDYNE, INC.

RECEIVED JUL 2 2 1993
Laboratory Services

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

LABORATORY REPORT

EPA METHOD 8020 -- COMPOUNDS BY EPA METHOD 8240

CLIENT: Griffin International
PROJECT NAME: Sunny Hollow Quick Stop
REPORT DATE: July 20, 1993
SAMPLER: J. Bernhard
DATE SAMPLED: July 6, 1993
DATE RECEIVED: July 7, 1993

PROJECT CODE: GISH1675
ANALYSIS DATE: July 15, 1993
STATION: SB-3 & SB-4 Composite
REF.#: 48,403
TIME SAMPLED: Not Indicated

Parameter	Detection Limit (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[2]
Chlorobenzene	20	ND
1,2-Dichlorobenzene	20	ND
1,3-Dichlorobenzene	20	ND
1,4-Dichlorobenzene	20	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	30	ND
MTBE	30	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

1,2 Dichloroethane-d4:	97.%
Toluene-d8:	101.%
4-Bromofluorobenzene:	98.%

PERCENT SOLIDS: 87.%

NOTES:
1 None detected

ENDYNE, INC.

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

CHAIN-OF-CUSTODY RECORD

007703

Project Name: Sunny Hollow Quick Stop Site Location: Colchester, VT	Reporting Address: Griffin International, Inc. 28 Dorset Ln. Williston VT 05495	Billing Address: SAME
Endyne Project Number:	Company: Griffin Contact Name/Phone #: Peter Murray 879708	Sampler Name: Jack Bernhard Phone #: 879705

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	SB-1 and SB-2 Composite	Soil		✓	7/6/93	1	250mL		8020		
	SB-3 and SB-4 Composite	Soil		✓	7/6/93	1	250mL		8020		
	MW-1	H_2O	✓		11:55	2	40mL		602	HCL	

Relinguished by: Signature	Received by: Signature	Date/Time 7/7/93 12:00 P.
Relinguished by: Signature	Received by: Signature	Date/Time 7/7/93 12:15 P.

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
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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):										