

FEB 17 10 14 AM '98

**Initial Site Investigation
Irving Mainway
Barton, VT
Site No. 97-2167**

Prepared for:

Irving Oil Corporation
700 Maine Avenue
PO Box 401
Bangor, ME 04402-0401

Prepared by:

Acadia Environmental Technology
4 Milk St.
Portland, ME 04101

January 20, 1998



Alison H. Jones, CG
Hydrogeologist



Thomas E. Schwarm, CG
President-Hydrogeologist

January 20, 1998

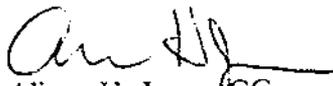
Mr. Gerald R. Lemire
Irving Oil Corporation
700 Maine Avenue
PO Box 401
Bangor, ME 04402-0401

Re: Initial Site Investigation
Irving Mainway, Barton, VT
Site No. 97-2167

Dear Mr. Lemire:

Acadia Environmental Technology (Acadia) conducted an "initial site investigation" at the Barton, VT Irving Mainway at the request of Irving Oil Corporation. We appreciate the opportunity to provide this service. Please feel free to call us at your convenience with your questions or comments.

Sincerely,


Alison H. Jones, CG
Hydrogeologist


Thomas E. Schwarm, CG
President-Hydrogeologist

encl.

Introduction

Acadia Environmental Technology (Acadia) conducted an "initial site investigation" at the Barton, VT Irving Mainway at the request of Irving Oil Corporation (Irving). This investigation was designed to meet scope of work requirements set forth in the Vermont Department of Environmental Conservation (DEC) "Site Investigation Guidance". According to the guidance, an "initial site investigation" is a comprehensive study of a release and the relevant site conditions. The purpose of the investigation is to define the source(s), degree, and extent of petroleum impact observed in the soil and groundwater during previous investigations.

Previous Work

Acadia conducted a Phase I investigation for Irving; the report was dated February 21, 1997. During the course of that investigation, we identified a history of petroleum sales and storage since at least 1956. There appear to have been at least 3 generations of underground storage tanks (USTs). The active tanks were installed in 1986; they include two 4,000 gallon, one 6,000 gallon and one 8,000 gallon UST. Three tanks contain gasoline; one of the 4,000 gallon tanks contains diesel. Older tanks were removed in 1986; they were estimated to be 8 to 10 years old at the time of removal. Documentation for tanks from 1956 to 1976 could not be found, but site ownership by Gulf Oil during this period indicates that USTs were in use. Caledonia Oil Company operated this facility before it was purchased by Irving in 1997.

Based on the results of the Phase I investigation, Acadia conducted a Phase II Environmental Site Assessment; the report was dated February 28, 1997. Four small-diameter soil borings were installed with a truck-mounted Geoprobe® rig to depths of 11 to 15 feet below grade. Soil samples were analyzed in the field with a photoionization detector (PID). Groundwater was analyzed for total gasoline range organics (GRO) in a laboratory. GRO exceeded 50 micrograms per liter (µg/l) in 2 of the four borings. The highest concentration was 120 µg/l. The concentrations were low. According to the Sites Management Section of the DEC, additional investigations may be required for sites with GRO concentrations above 50 µg/l.

Scope of Work

- Site Safety Plan

Before commencing any site work, a site-specific safety plan was prepared according to 29 CFR 1910.120. All on-site personnel were OSHA 40-hour trained.

- Receptor Survey

Acadia conducted a survey of potential sensitive receptors at or near the site, including identification of Well Head Protection Areas (WHPAs), residential water wells, surface waters, buildings with basements, wetlands, sensitive ecological areas, areas of direct soil contact threat, and utility corridors.

- Monitoring Well Installation

Acadia instructed Irving personnel where to mark each site for Digsafe so that the appropriate utilities were notified of our intent to drill. A hollow-stem auger rig was used for one day to install 4 two-inch diameter monitoring wells. Boring locations were chosen based on the Phase II ESA findings.

An on-site Acadia geologist supervised drilling activities and logged the borings.

Borings were drilled to 20 feet below grade. Wells were constructed of 2-inch diameter PVC 0.010-inch slotted screen to a depth approximately 2 to 3 feet below grade and solid 2-inch diameter riser to the surface. Filter sand was installed to one foot above the screen, and a bentonite seal will be installed above the sand. Wells were completed with road boxes with a triangular "monitoring well" symbol on the cover. Concrete pads were installed in high-traffic areas; concrete pads will not be installed in lawns and unpaved, non-traffic areas. Padlocks were used to lock each well to discourage tampering. Drilling equipment was cleaned before advancing each boring to prevent cross-contamination.

- Soil Analysis

Split-spoon soil samples were collected at 5 foot intervals during advancement of each boring. Soil samples will be collected in polyethylene bags for analysis. Volatile organic compound (VOC) concentrations in the soil headspace were analyzed with a Photovac Microtip photoionization detector (PID) with a 10.6 eV lamp. The PID was calibrated daily. Results of PID analyses are noted on the logs.

- Survey, Gauging, and Sampling

Top-of casing elevations of the monitoring wells were surveyed with a rod and level relative to a benchmark with an assigned elevation of 100 feet. Elevations were surveyed to the nearest 0.01 feet. Well locations and other site information were plotted on a site map (Figure 2).

Depths to liquid in the monitoring wells were gauged with a Keck-IR interface probe. This instrument measures depths to water with an accuracy of 0.01 feet. It measures light-non-aqueous phase liquid (LNAPL) thicknesses over 0.06 feet. The water surface in each well was examined with a clear bailer to detect any thin LNAPL layers.

Groundwater samples were collected from each monitoring well which contained water. Wells were purged of at least 3 well volumes of water and water samples were collected with disposable polyethylene bailers.

- Laboratory Analysis of Groundwater Samples

Groundwater samples were submitted to Katahdin Analytical Services in Westbrook, Maine for analysis by modified EPA Method 8015 for gasoline range organics (GRO) and by EPA Method 8020 for benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl-tertiary-butyl-ether (MTBE). Samples were preserved and transported according to the protocol of the laboratory. Chain-of-custody documentation was maintained.

- Report Preparation

Acadia prepared this report to document the scope of work, methodology, and the results.

Results

Receptors

Acadia spoke with Gerry Baillargon of the Barton Water District on December 4, 1997. He knew of no private water wells within 1000 feet of the investigation site (Figure 1). Acadia did not observe any wells in the area.

The public water supply is surface water located 1.5 miles from the subject property, according to Mr. Baillargon.

Underground utilities that run along Route 5 to the west of the site include sanitary and storm sewer, and public water lines.

The Congress Court Apartments are located across Route 5 from the site. The apartments have a daylight basement. A 3-story private residence, also across Route 5 appears to have a basement also.

Nearby surface water includes a drainage ditch which runs along the southern property boundary. This drainage flows west around a baseball field to the Barton River which is located about 200 meters to the west.

Geology

Soils encountered during drilling consisted of sand which is likely fill above a sandy silt. Bedrock was not encountered.

Hydrogeology

The four monitoring wells were gauged on December 8, 1997. Groundwater depths ranged from approximately 7 feet below grade at MW-1 to 12 feet below grade at MW-4.

A groundwater contour map was prepared (Figure 2) which shows that groundwater flows from east to west. The horizontal hydraulic gradient is approximately 0.025 ft/ft. The water level measured in the drainage to the south of the site was higher than on the site; however, water in the drainage is likely perched as the drainage is concrete-lined.

The Barton River is located about 200 meters to the west. It is likely that groundwater discharges there.

Soil Quality

PID analysis of soil yielded low VOC concentrations typical of background in MW-1, MW-2 and MW-4. VOC concentrations in MW-3 were also consistent with background levels except for a sample from 6 to 8 feet below grade where a concentration of 27 parts per million (ppm) was recorded.

PID analyses results are on the well logs in Appendix B.

Groundwater Quality

No LNAPL was found at the site. Results of laboratory analyses are summarized in Table I below:

TABLE I:
Groundwater Quality

Well	GRO by EPA Method 8015 (mod)	BTEX + MTBE by EPA Method 8020
MW-1	ND (<10 µg/l)	ND for all analytes
MW-2	ND (<10 µg/l)	BTEX--ND MTBE 0.6 µg/l
MW-3	3200 µg/l	benzene 0.79 µg/l toluene 9.0 µg/l ethylbenzene 8.8 µg/l xylenes 59 µg/l MTBE 1.3 µg/l
MW-4	ND (<10 µg/l)	ND for all analytes

ND = not detected above the practical quantitation level

GRO was detected only at MW-3, which appears to be directly downgradient of the USTs. Total BTEX in MW-3 was 77.59 µg/l; none of the BTEX compounds exceeded federal drinking water maximum contaminant levels (MCLs). MTBE was detected in MW-2 and MW-3 at concentrations of 0.6 and 1.3 µg/l respectively. There is no federal MCL for MTBE. Isoconcentrations were not plotted on the groundwater contour map because BTEX and GRO were detected at only one well.

Laboratory reports are in Appendix C.

Conclusions

- GRO was detected in only one well, which was located directly downgradient of the tank area. Concentrations were low, and not indicative of a large petroleum release. In fact, concentrations were within federal MCLs. We found no indication of LNAPL at the site.
- VOC concentrations in soil were generally consistent with background levels. Slightly elevated VOC concentrations were detected only in MW 3.
- Groundwater flows from east to west toward the Barton River, located approximately 200 meters to the west.
- We found no evidence of groundwater use in the area. Public water is available and in use.

- Potential sensitive receptors include basements across Route 5 to the west, surface water of the Barton River, and underground utilities. GRO and BTEX concentrations at MW-3 are low, and impacts to the River and basements appear unlikely. Impacts to underground utilities would also appear to be negligible because concentrations are low and dilution would likely reduce concentrations to below detection limits in sewer lines.
- The Irving Mainway site has a long history of petroleum sales and storage dating back to at least 1956. At sites with similar histories, petroleum compounds are often found at concentrations above laboratory detection limits. GRO, BTEX and MTBE concentrations detected at this site are generally low, and are not indicative of large petroleum releases. Because concentrations are low, public water is in use, and impacts to other receptors such as basements appears unlikely, we do not recommend that further work be conducted at this site.

Initial Site Investigation
Irving Mainway
Barton, VT
Site No. 97-2167

Appendix A:
Figures

Prepared for:

Irving Oil Corporation
700 Maine Avenue
PO Box 401
Bangor, ME 04402-0401

Prepared by:

Acadia Environmental Technology
4 Milk St.
Portland, ME 04101

January 20, 1998

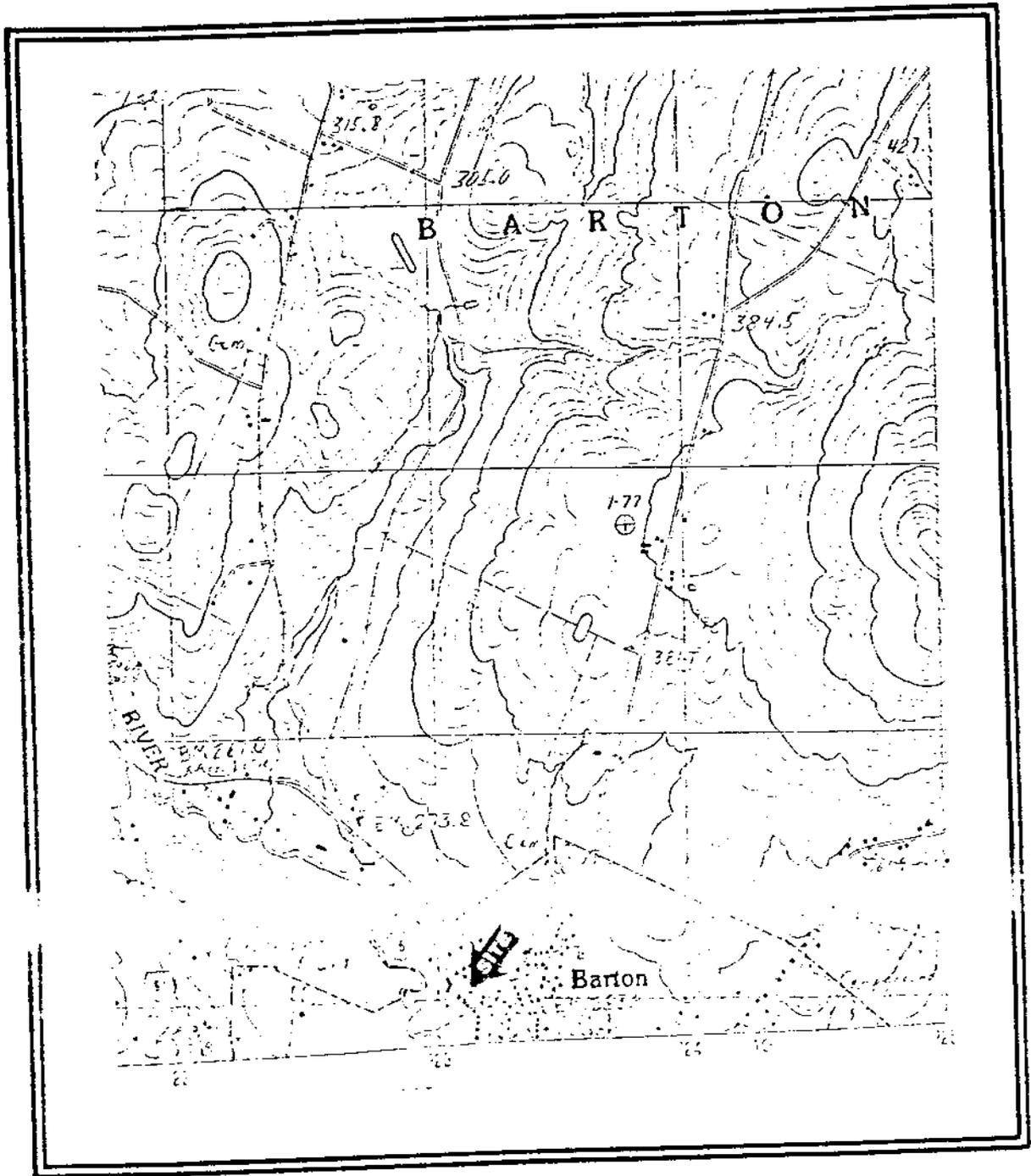


Figure 1:
Site Location Map
USGS Topographic Quadrangle
Orleans, VT
1:24,000

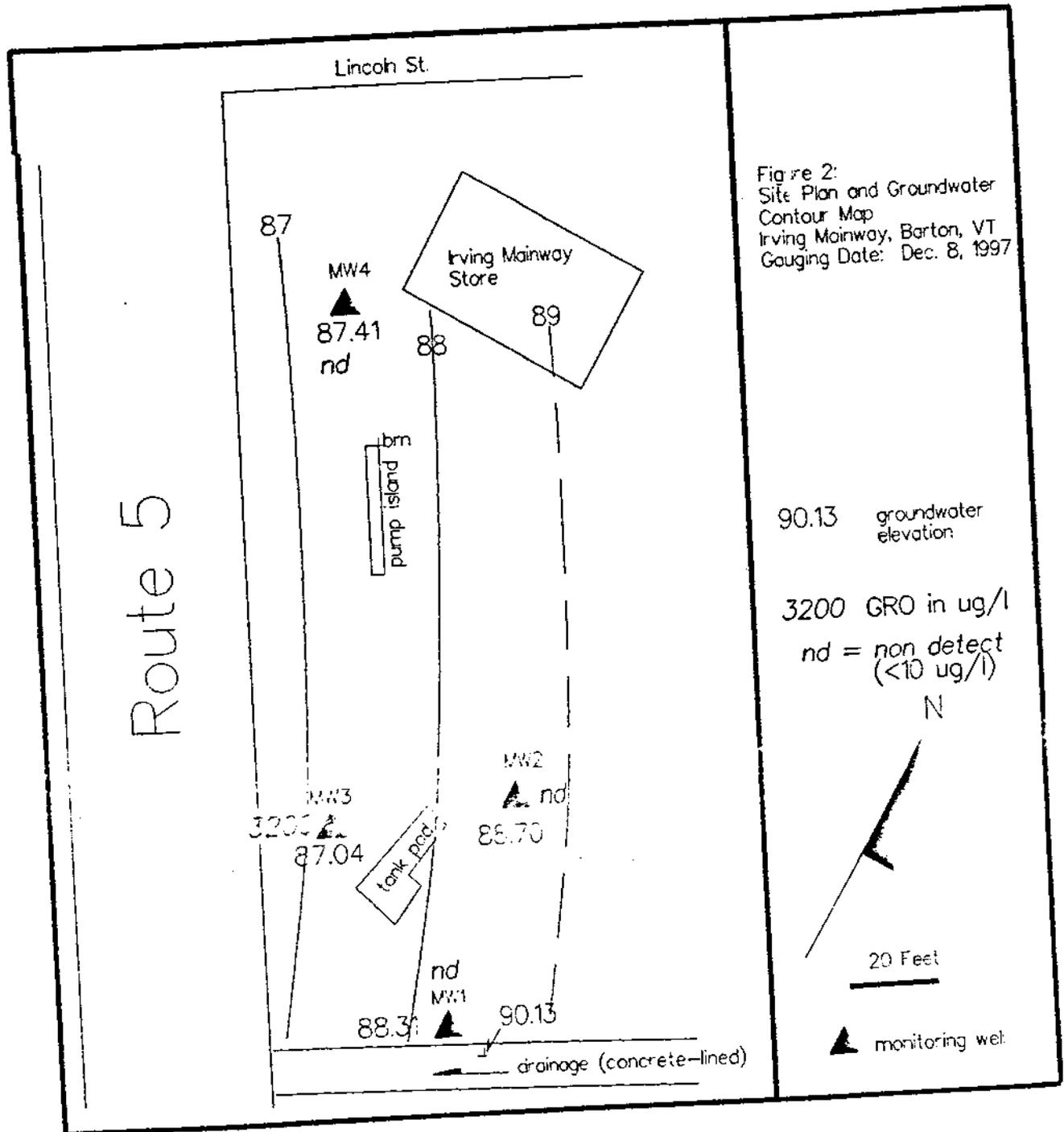
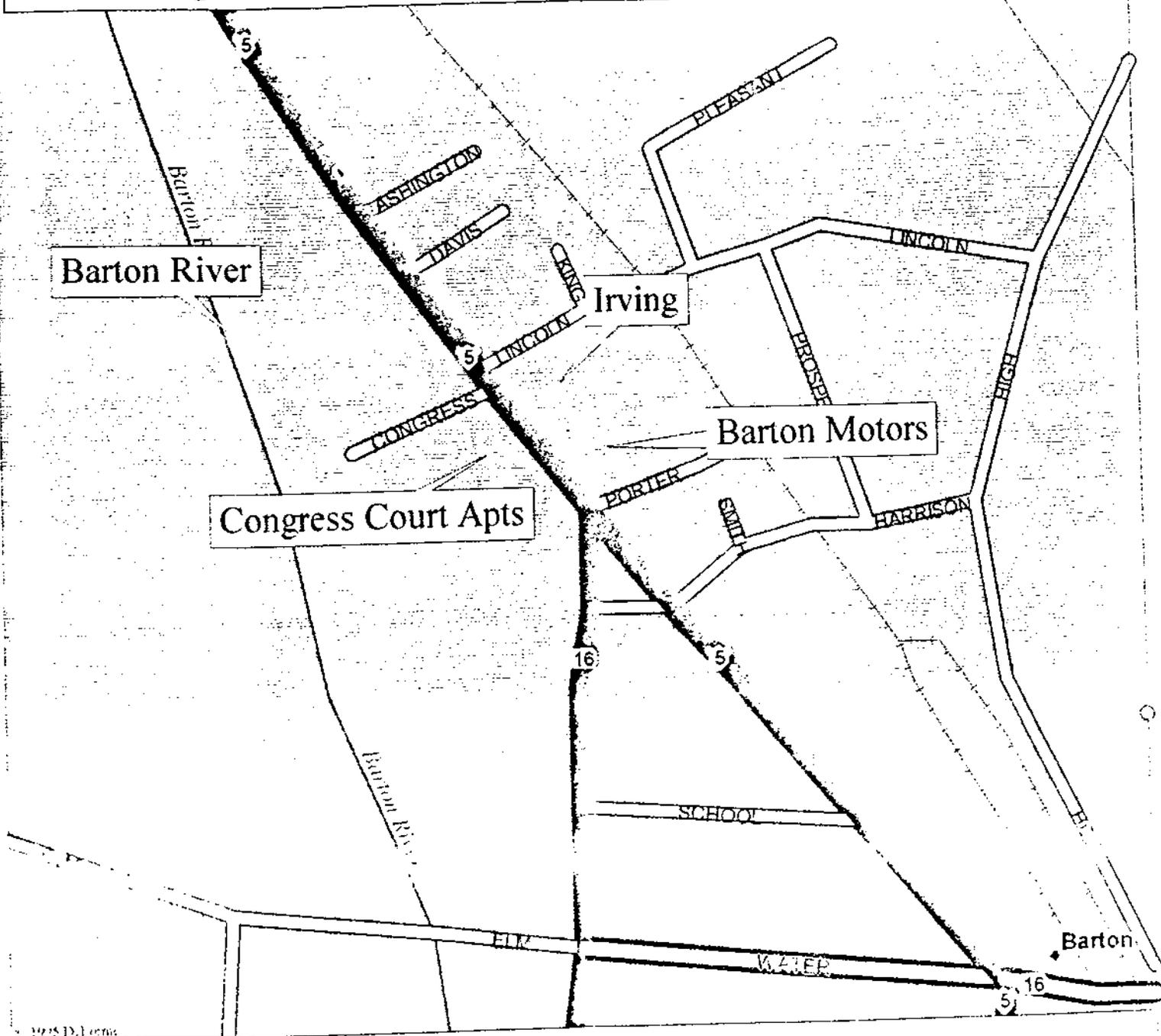


Figure 3: Vicinity Map, Barton, VT



Mag 16 00
 Wed Jan 14 12 15 1998
 Scale 1:3,900 (at center)
 200 Feet
 100 Meters

- | | |
|----------------------------------|-------------------|
| — Secondary SP. Road, Hwy Rampl. | Population Center |
| — State Route | Woodland |
| — Interstate Limited Access | Contour |
| — US Highway | — River |
| — Primary State Route | |
| — Railroad | |
| ◆ Town, Small City | |

Acadia Environmental Technology

Well Number MW1
 Project Number 5325

Project: Irving / Barton
 Date Drilled: Nov. 13, 1997 T.D. 20 ft Diameter 6 in.
 T.O.C. _____ Water Depth, Initial 6.91 ft.
 Screen: Diam. 2 in. Length 17 ft Slot 0.010 in.
 Casing: Diam. 2 in. Length 3 ft Type pvc
 Drilling Co. Capital Drilling Method: HSA
 Driller: Joy Log by: Scott Burritt
 Sampling Method: cont. splt spoon

Depth (feet)	Well Construction	PID (ppm)	Flows	Sample Interval Recovery	Description/Soil Classification (Color, Texture, Structures)
0					Asphalt surface
1		18	16.33	SS1 14 in	Brown, dry, fine to coarse SAND, trace gravel.
2			27		
3			34	SS2 12 in	SAME
4		7	Note for		Some silty
5		6	5.33	SS3 1 in	Auger'd down through cobbles and gravel. Enter had difficulty advancing spoon, so we skipped this interval.
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Acadia Environmental Technology

Well Number MW2
Project Number 5325

Project: Irving / Barton
Date Drilled: Nov. 13, 1997 T.D. 20 ft Diameter 6 in.
T.O.C. _____ Water Depth, Initial 8.45 ft.
Screen: Diam. 2 in. Length 17 ft Slot 0.010 in
Casing: Diam. 2 in Length 3 ft Type pvc
Drilling Co. Capital Drilling Method: HSA
Driver: Jay Log by: Scott Burriil
Sampling Method: split spoon

Depth (feet)	Well Construction	P.I.D. (ppm)	Blows	Sample Interval Recovery	Description/Soil Classification (Color, Texture, Structures)
0					Asphalt Surface
0.5			SS1	85	Brown, dry, fine to coarse sand, trace gravel.
1.0			SS2	85	SAME, moist to comp.
1.5			SS3	85	SAME
2.0			SS4	85	SAME

Acadia Environmental Technology

Well Number MW3
 Project Number 5325

Project: Irving / Barton
 Date Drilled: Nov. 13, 1997 T.D. 20 ft Diameter 6 in.
 T.O.C. _____ Water Depth, Initial 9.9 ft.
 Screen: Diam. 2 in. Length 17 ft Slot 0.010 in.
 Casing: Diam. 2 in. Length 3 ft Type pvc
 Drilling Co. Capital Drilling Method: HSA
 Driller: Jay Log by: Scott Burri
 Sampling Method: split spoon

Depth (feet)	Well Construction	P.I.D. (ppm)	Blows	Sample Interval Recovery	Description/Soil Classification (Color, Texture, Structures)
0					Asphalt Surface
11			50 for 1 ft	SS1 1 ft	Brown, dry, fine to coarse SAND.
27			100 for 1 ft	SS2 1 ft	Brown, wet SLT. Petroleum odor.
31			100 for 1 ft	SS3 1 ft	Brown, wet SLT. Petroleum odor.
34			100 for 1 ft	SS4 1 ft	SAND

Acadia Environmental Technology

Well Number MW4
Project Number 5325

Project: Irving / Barton
Date Drilled: Nov. 13, 1997 T.D. 20 ft Diameter 6 in.
T.O.C. _____ Water Depth, Initial 12.35 ft.
Screen: Diam. 2 in. Length 17 ft Slot 0.010 in.
Casing: Diam. 2 in. Length 3 ft Type pvc
Drilling Co. Capital Drilling Method: HSA
Driller: Jay Log by: Scott Burrill
Sampling Method: split spoon

Depth (feet)	Well Construction	P.L.D. (ppm)	Blows	Sample Interval Recovery	Description/Soil Classification (Color, Texture, Structures)
0	Asphalt Surface				
0 - 17	Screen	0	0-17	SS-1 17 in	Brown, dry, fine to coarse sand and gravel, some silt.
14		14	14	SS-2	Brown, damp, fine sand, grading to wet silt.
17					
17 - 18				SS-4	SAME
18 - 19				SS-5	SAME
19 - 20					

Page 1 of 1

**Initial Site Investigation
Irving Mainway
Barton, VT
Site No. 97-2167**

Appendix B:
Well Logs

Prepared for:

Irving Oil Corporation
700 Maine Avenue
PO Box 401
Bangor, ME 04402-0401

Prepared by:

Acadia Environmental Technology
4 Milk St.
Portland, ME 04101

January 20, 1998

**Initial Site Investigation
Irving Mainway
Barton, VT
Site No. 97-2167**

Appendix C:
Laboratory Reports

Prepared for:

Irving Oil Corporation
700 Maine Avenue
PO Box 401
Bangor, ME 04402-0401

Prepared by:

Acadia Environmental Technology
4 Milk St.
Portland, ME 04101

January 20, 1998



December 24, 1997

Ms. Alison Jones
Acadia Environmental Technology
4 Milk Street
Portland, ME 04101

RE: Katahdin Lab Number: WN3434
Project ID: Barton Mainway
Project Manager: Ms. Kelly Perkins
Sample Receipt Date: December 10, 1997

Dear Ms. Jones:

Please find enclosed the following information:

- * Report of Analysis
- * Chromatograms
- * Confirmation
- * Chain of Custody

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Hanna Couch
Authorized Signature

12/24/97
Date



CLIENT: Thomas Schwarm
 Acadia Environmental Technology
 4 Milk Street
 Portland, ME 04101

Lab Number : WN-3434-1
 Report Date: 12/24/97
 PO No. : 5325
 Project : BARTON MAINWAY

REPORT OF ANALYTICAL RESULTS

Page 1 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY		SAMPLED DATE RECEIVED				
MN-1	Aqueous	S.BURRILL		12/08/97	12/10/97			
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Gasoline Range Organics	<10	µg/L	1.0	10	8015M-GRO	12/18/97	TL	
Gasoline Range Organics	97.	%	1.0		8015M-GRO	12/18/97	TL	
4-Bromofluorobenzene								
Purgeable Aromatics+MIBB								
Benzene	<0.50	µg/L	1.0	0.50	SW8020	12/19/97	MD	
Toluene	<1.0	µg/L	1.0	1.0	SW8020	12/19/97	MD	
Ethylbenzene	<1.0	µg/L	1.0	1.0	SW8020	12/19/97	MD	
Xylenes	<1.5	µg/L	1.0	1.5	SW8020	12/19/97	MD	
Methyltertbutyl ether	<0.50	µg/L	1.0	0.50	SW8020	12/19/97	MD	
a,a,a-Trifluorotoluene (% Recovery)	101.	%	1.0	101.	SW8020	12/19/97	MD	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/24/97

LJO/jcbkp(dw)/mld



CLIENT: Thomas Schwarm
 Acadia Environmental Technology
 4 Milk Street
 Portland, ME 04101

Lab Number : WN-3434-2
 Report Date: 12/24/97
 PO No. : 5325
 Project : BARTON MAINWAY

REPORT OF ANALYTICAL RESULTS

Page 2 of 4

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED					
			12/08/97	12/10/97				
MW-2	Aqueous	S.BURRILL						
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Gasoline Range Organics	<10	µg/L	1.0	10	8015M-GRO	12/18/97		TL
Gasoline Range Organics					8015M-GRO	12/18/97		TL
4-Bromofluorobenzene	90.	%	1.0					
Purgeable Aromatics+MIBB				0.50	SW8020	12/16/97		MD
Benzene	<0.50	µg/L	1.0	1.0	SW8020	12/16/97		MD
Toluene	<1.0	µg/L	1.0	1.0	SW8020	12/16/97		MD
Ethylbenzene	<1.0	µg/L	1.0	1.5	SW8020	12/16/97		MD
Xylenes	<1.5	µg/L	1.0	0.50	SW8020	12/16/97		MD
Methyltertbutyl ether	0.6	µg/L	1.0		SW8020	12/16/97		MD
a,a,a-Trifluorotoluene (% Recovery)	97.	%	1.0					

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/24/97

LJO/jcbkp(dw)/mld



CLIENT: Thomas Schwarm
 Acadia Environmental Technology
 4 Milk Street
 Portland, ME 04101

Lab Number : WN-3434-3
 Report Date: 12/24/97
 PO No. : 5325
 Project : BARTON MAINWAY

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED		
MW-3	Aqueous		S.BURRILL		12/08/97	12/10/97	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED BY	NOTES
Gasoline Range Organics							1
Gasoline Range Organics	3200.	µg/L	5	10	8015M-GRO	12/18/97 TL	
4-Bromofluorobenzene	120.	%	5		8015M-GRO	12/18/97 TL	
Purgeable Aromatics+MTBE							
Benzene	0.79	µg/L	1.0	0.50	SW8020	12/17/97 MD	
Toluene	9.0	µg/L	1.0	1.0	SW8020	12/17/97 MD	
Ethylbenzene	8.8	µg/L	1.0	1.0	SW8020	12/17/97 MD	
Xylenes	59.	µg/L	1.0	1.5	SW8020	12/17/97 MD	
Methyltertbutyl ether	1.3	µg/L	1.0	0.50	SW8020	12/17/97 MD	
a,a,a-Trifluorotoluene (% Recovery)	110.	%	1.0		SW8020	12/17/97 MD	

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
 (1) Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

12/24/97

LJO/jcbkpdw)/mld



CLIENT: Thomas Schwarm
 Acadia Environmental Technology
 4 Milk Street
 Portland, ME 04101

Lab Number : WN-3434-4
 Report Date: 12/24/97
 PO No. : 5325
 Project : BARTON MAINWAY

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX		SAMPLED BY		SAMPLED DATE RECEIVED			
	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
MW-4	Aqueous			S.BURRILL		12/08/97	12/10/97	
Gasoline Range Organics	<10	µg/L	1.0	10	8015M-GRO	12/18/97		TL
Gasoline Range Organics	84.	%	1.0		8015M-GRO	12/18/97		TL
4-Bromofluorobenzene								
Purgeable Aromatics+MTBE				0.50	SWF020	12/16/97		MD
Benzene	<0.50	µg/L	1.0		1.0 SW8020	12/16/97		MD
Toluene	<1.0	µg/L	1.0		1.0 SW8020	12/16/97		MD
Ethylbenzene	<1.0	µg/L	1.0		1.5 SW8020	12/16/97		MD
Xylenes	<1.5	µg/L	1.0		0.50 SW8020	12/16/97		MD
Methyltertbutyl ether	<0.50	µg/L	1.0		SW8020	12/16/97		MD
a,a,a-Trifluorotoluene (% Recovery)	97.	%	1.0					

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

12/24/97

LJO/jcbkp (dw) /mld

