

NOV 05 1993



November 3, 1993

Mr. Chuck Schwer  
Sites Management Section  
Vermont Department of  
Environmental Conservation  
103 South Main Street  
Waterbury, VT 05671-0404

RE: Ground Water Monitoring Well Installation and Sampling Results -  
DeCelle's Market, Moscow, VT

Dear Chuck:

Lincoln Applied Geology, Inc. (LAG) has recently completed the installation and ground water sampling of monitoring well MW-1 at DeCelle's Market in Moscow (Stowe), Vermont. This work was done in accordance with the agreements reached relative to your original June 30, 1992 request for defining the extent and degree of any contamination. The locations of the market and potential receptors of any contamination are depicted on **Figure 1 and Figure 2**. During drilling the subsurface soils demonstrated no evidence of petroleum contamination, and a ground water sample collected from MW-1 contained no detectable levels of the gasoline constituents BTEX and MTBE.

A 1,000 gallon gasoline underground storage tank (UST) and another 500 gallon gasoline UST were excavated and removed from the site under the supervision of Griffin International, Inc. on June 17, 1992. During removal of the USTs a small quantity of gasoline from a service pipe break spilled approximately 3 gallons of gasoline onto subsurface soils. About one cubic yard of contaminated soil was excavated, and the excavation was backfilled with clean fill. No ground water was encountered at the maximum excavation depth of 6 feet.

In response to the discovery of contaminated soil during excavation of the USTs, on June 30, 1992 the Vermont Department of Environmental Conservation (VDEC) requested that Mr. DeCelle hire a qualified environmental consultant to install a minimum of one ground water monitoring well, analyze ground water for BTEX and MTBE, determine the extent of subsurface soil and ground water contamination, and perform a receptor risk assessment. After numerous discussions and negotiations, Mr. DeCelle hired LAG on October 9, 1993 to install one monitoring well, sample and analyze the ground water, and perform a limited receptor assessment.

Mr. Chuck Schwer  
Page 2  
November 3, 1993

Ground water monitoring well MW-1 was installed on October 28, 1993 by Tri State Drilling and Boring, Inc. (TSDB) five feet east of the pump island at the former location of the 1,000 gallon UST and contaminated soils. LAG supervised the well installation, logged the subsurface soils descriptively, and screened the soils for the presence of volatile organic compounds (VOCs) using a HNU photoionization detector (PID) with a 10.2 eV lamp. Subsurface soils consisted of dry sand and gravel backfill from the surface to a depth of 7.8 feet. Moist sand and silty clay native soils were present from 7.8 to 9 feet, below which was wet silty clay of low hydraulic conductivity to a depth of 13 feet. Beneath the silty clay was wet gravel and sand to the bottom of the boring at 15.5 feet. Using the PID and olfactory senses as screening tools, no petroleum contaminants were detected from the soils.

A 2-inch diameter PVC monitoring well (MW-1) was installed in the boring. The well is constructed of 10 feet of slotted well screen and 5 feet of solid riser pipe. A coarse sand pack fills the annular space between the well screen and the subsurface soils, and a bentonite seal prevents the downward migration of surface water into the well. The well is capped with an expansion plug and well box cemented flush with grade. The LAG and TSDB well logs, including well construction details, are included as **Attachment A**. The location of MW-1 is shown on **Figure 2**.

A sample of the ground water was collected following well installation and proper purging of the well. The sample was delivered along with a trip blank and proper chain-of-custody form to the MicroAssays of Vermont (MAV) laboratory in Middlesex for BTEX and MTBE analysis. Analytical results of the MW-1 sample indicate that levels of BTEX and MTBE were all below the analytical detection limits. The MAV analytical reports are included as **Attachment B**.

Drinking water for DeCelle's Market and other private homes to the east, north, and west is supplied by spring sources located on the hill to the north of DeCelle's, upgradient of the former UST area. The Little River is located about 300 feet south of the former USTs, and flows to the west into the Waterbury Reservoir. Only an open lot used for the storage of gravel, stone, and other construction materials lies between DeCelle's and the river. No drilled wells are present on the DeCelle property, and no drilled wells were observed in the immediate vicinity. A culvert that conveys surface water from the north to the south side of the road empties behind DeCelle's. No sheen, odors, or other evidence of gasoline contamination associated with the culvert or the Little River was evident.



Lincoln Applied Geology, Inc.  
Environmental Consultants

RD # 1 Box 710 • Bristol, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

Mr. Chuck Schwer  
Page 3  
November 3, 1993

The limited investigation conducted by LAG at the DeCelle's Market site indicates that no gasoline-related contamination of subsurface soils or ground water in the area of the former USTs, former pump island, or former spillage area was detected by visual and olfactory senses, the PID, or laboratory analysis. The receptor analysis indicates that the several homes in the area and DeCelle's Market obtain drinking water from spring sources located on the hill to the north of DeCelle's. No evidence of gasoline contamination associated with surface water draining the culvert behind DeCelle's or in the Little River was observed.

Based on these observations and findings, we recommend that no further action be taken at this site. No indicators of gasoline contamination of soils and ground water were found, and it is unlikely that additional investigations would detect gasoline-related contamination.

If you have any questions or comments regarding this investigation, please call me or John Amadon, LAG Project Manager at 453-4384. It has been a pleasure performing this investigation for Mr. DeCelle and the VDEC, and it was especially welcome to find no gasoline contamination.

Sincerely,



William D. Norland  
Hydrogeologist

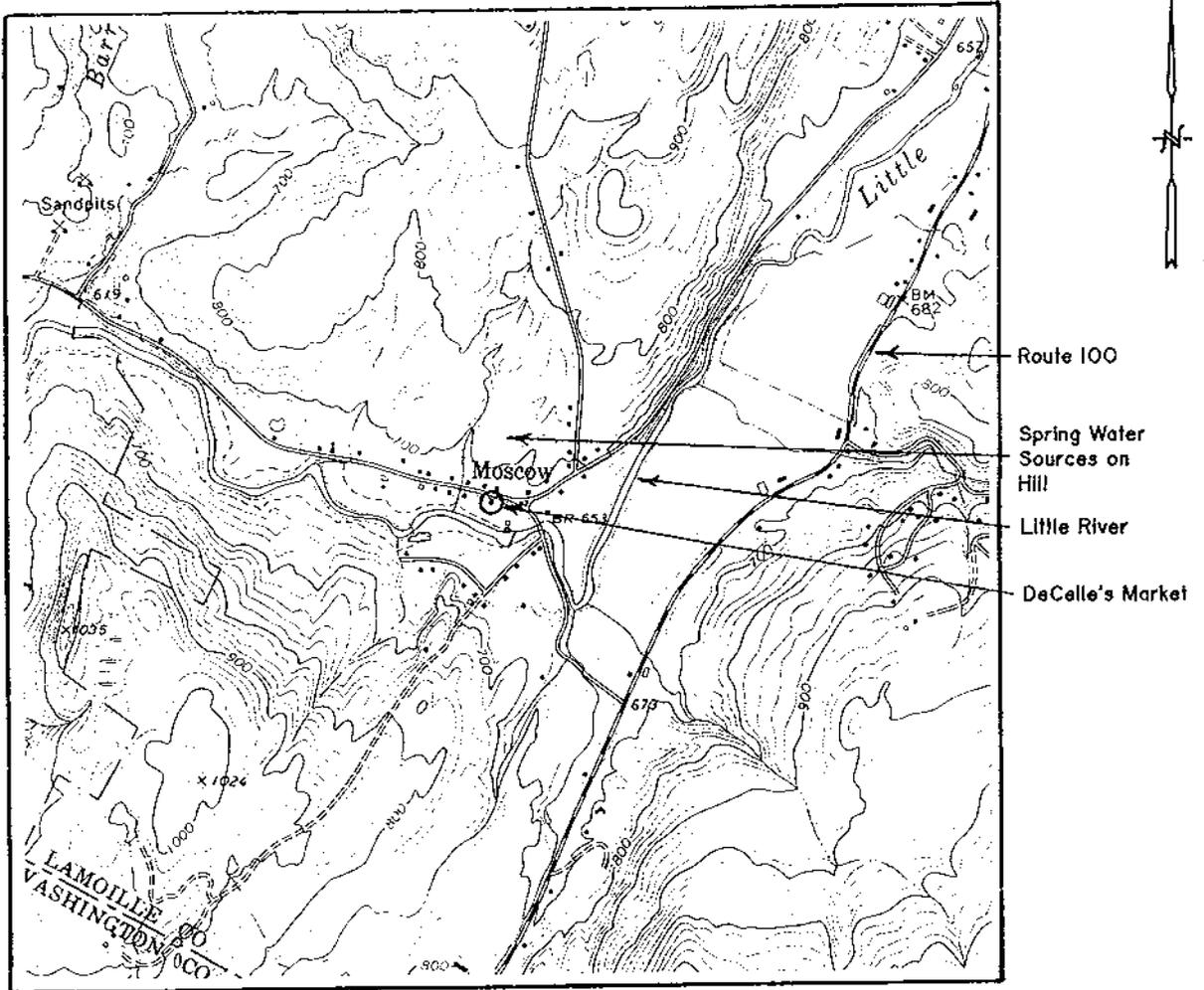
WDN/tasp  
Enclosures  
cc: Paul DeCelle



Lincoln Applied Geology, Inc.  
Environmental Consultants

RD # 1 Box 710 • Bristol, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

### DeCelle's Market GENERAL LOCATION MAP



Source: U.S.G.S. 7.5 min.  
Topo Series  
Stowe, Vt Quad

Scale: 1" = 2000'

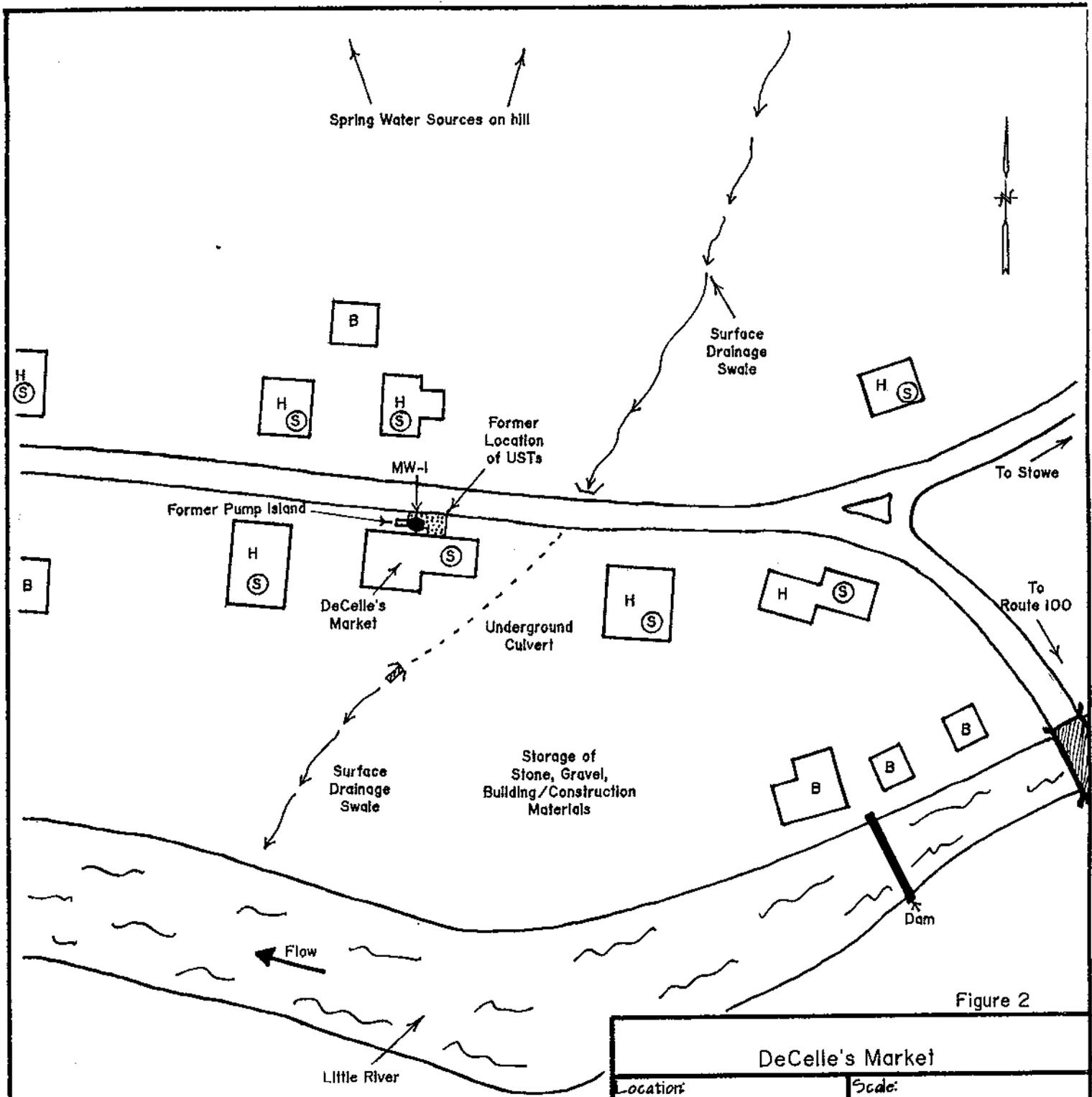


Figure 2

**LEGEND**

- H House
- B Barn
- Ⓢ Spring Water Source
- Monitor Well MW-1

<b>DeCelle's Market</b>	
Location: Moscow, Vermont	Scale: -1" = 100'
Location of MW-1, Former USTs and Pump Island, and Surrounding Residential Water Supply Sources	
Date: Oct 1993	Job Type: UST Pull Investigation

# ATTACHMENT A

Well Logs

## WELL LOG

WELL: MW-1

LOCATION: DeCelle's Market, P.O. Box 216, Moscow, VT. 5' east of former pump island.

DRILLER: Tri-State Drilling and Boring, Inc., West Burke, VT.

HYDROGEOLOGIST: William Norland

DATE: October 28, 1993

### Soils Description

Background = BG = 0.2 ppm

<u>Depth</u>	<u>Description</u>	<u>HNU (ppm)</u>
0-3'	Sand and gravel fill at former UST location.	
3-5'	Moist, brown, <u>Medium to coarse sand</u> ; some fine to medium gravel; trace fine sand.	0.2 (3-5')
5-5.9'	Dry, brown gray, <u>Medium to coarse sand</u> ; some fine to medium gravel; trace fine sand.	0.2 (5-7')
5.9-7'	Dry, rust brown, <u>Medium to coarse sand</u> ; some fine to coarse gravel; trace fine sand.	
7-7.8'	Dry, rust brown, <u>Fine to coarse gravel</u> ; some medium to coarse sand; trace fine sand.	0.2 (7-7.8')
7.8-8.2'	Moist, tan brown, <u>Fine to medium sand</u> ; little silt.	
8.2-8.4'	Moist, olive brown, <u>silty clay</u> .	BG (7.8-9')
8.4-9'	Moist, tan brown and brown, <u>Medium sand</u> ; little fine sand; trace silt.	
9-11'	Moist to wet, olive green, <u>silty clay</u> . (Becomes more silty toward base = clayey silt). Low hydraulic conductivity.	BG (9-11')

11-12.4'	Wet, olive green to olive grey, <u>silty clay</u> .	BG (11-13')
12.4-13'	Dry, dark grey and buff, <u>Mica Schist cobble</u> .	
13-13.5'	Wet, tan, <u>fine sand and silt</u> .	BG (13-15')
13.5-15'	Wet, tan and rust, <u>Fine to coarse gravel</u> ; some fine to coarse sand; trace silt.	
	Drill to 15.5' depth, install well.	

### Well Construction

Bottom of Boring: 15.5'

Well Screen: (10') 5.5'-15.5'; 0.020 slot, 2" PVC, sch.40

Solid Riser: (5') 0.5'-5.5'; 2" PVC, sch.40

Sand Pack: (11') 4.5'-15.5'

Bentonite Seal: (1') 3.5'-4.5'

Backfill: (3') 0.5'-3.5'

Well Box: One-cemented flush with grade.

SOIL PROBE LOG

Page 1 of 1  
 MW # 1  
 DeCelle's Market  
 Moscow, VT

TRI STATE  
 DRILLING & BORING, INC.  
 RFD #2, Box 113 West Burke, VT 05871  
 (802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	HSA	SS	Wet
SIZE	2"		Moist
HAMMER	140#		Damp
FALL	30"		Slightly Damp

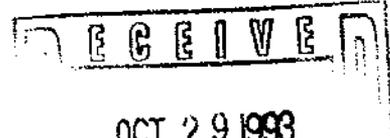
DATE STARTED: 10/28/93

DATE COMPLETED: 10/28/93

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS



6 12 18 24

3-3'	3	4	4	5	5"	Dry.	Brown sandy gravel fill.
5-7'	6	9	11	14	15"	Dry.	Same.
7-9'	12	4	4	3	15"	Moist.	Dark and light fine sands under 2" silt layer. Under sands and gravel.
9-11'	1	2	3	4	20"	Wet.	Olive brown clay, trace of silt.
11-13'	2	2	20	22	17"	Wet.	Olive brown clay over weathered rock.
13-15'	13	13	13	18	12"	Sat'd.	Brown fine sands and gravel.
							Screen 15' to 5' below GS.
							Riser to surface.
							Sandpack 15' to 4' below GS.
							Hole plug 4' to 3' below GS.
							Installed road box.

Client: DeCelle's Market  
 Job Location: Moscow, VT  
 Engineer: Lincoln Applied Geology  
 Bristol, VT  
 Inspector: Bill Norland

Driller: Ed Westover  
 Helper: Hank Dawson  
 Materials: 10' screen, 5' riser,  
 1 cap, 1 locking plug, 3.5 sand,  
 1/2 hole plug, 1 road box.

# ATTACHMENT B

## Analytical Results



## LABORATORY ANALYSIS

CLIENT NAME:	Lincoln Applied Geology	MAV CONTROL NO.:	7620
ADDRESS:	RD #1 Box 710 Bristol, VT 05443	PROJECT NO.:	Not Given
SAMPLE LOCATION:	DeCelle's Market	DATE OF SAMPLE:	10/28/93
SAMPLER:	Bill Norland	DATE OF RECEIPT:	10/28/93
		DATE OF ANALYSIS:	10/31/93
ATTENTION:	John Amadon	DATE OF REPORT:	10/31/93

Pertaining to the analyses of specimens submitted under the accompanying chain of custody form, please note the following:

- Samples were preserved with HCl.
- Specimens were processed and examined according to the procedures outlined in the specified method.
- Holding times were honored.
- Instruments were appropriately tuned and calibrations were checked with the frequencies required in the specified method.
- Blank contamination was not observed at levels interfering with the analytical results.
- Matrix spikes, matrix spike duplicates, and continuing calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were recorded and determined to be within method QA/QC acceptance limits.
- The inferred efficiency of analyte recovery for individual samples was monitored by the addition of surrogate analytes to all samples, standards, and blanks. Surrogate recoveries were found to be within laboratory QA/QC acceptance limits, unless noted otherwise.

Reviewed by:

Brendan McMahon, Ph.D.  
Director, Chemical Services



## LABORATORY REPORT

### GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	Not Given
PROJECT NAME:	DeCelle's Market	REF.#:	7620
REPORT DATE:	October 31, 1993	STATION:	MW-1
DATE SAMPLED:	October 28, 1993	TIME SAMPLED:	13:08
DATE RECEIVED:	October 28, 1993	SAMPLER:	Bill Norland
ANALYSIS DATE:	October 31, 1993		

PARAMETER	PQL ( $\mu\text{g/L}$ )	Concentration ( $\mu\text{g/L}$ )
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
Xylenes	3	BPQL
MTBE	1	BPQL

Surrogate % Recovery: 98%

BPQL = Below Practical Quantitation Limit (PQL).



## LABORATORY REPORT

### GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	Not Given
PROJECT NAME:	DeCelle's Market	REF.#:	7620
REPORT DATE:	October 31, 1993	STATION:	Trip Blank
DATE SAMPLED:	October 28, 1993	TIME SAMPLED:	07:45
DATE RECEIVED:	October 28, 1993	SAMPLER:	Bill Norland
ANALYSIS DATE:	October 31, 1993		

PARAMETER	PQL ( $\mu\text{g/L}$ )	Concentration ( $\mu\text{g/L}$ )
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
Xylenes	3	BPQL
MTBE	1	BPQL

Surrogate % Recovery: 100%

BPQL = Below Practical Quantitation Limit (PQL).

RUSH

CHAIN OF CUSTODY RECORD



MicroAssays of Vermont

RR#3 Box 5210 P.O. Box 189  
Montpelier, VT 05602  
Ph. (802)223-1468 Fax (802)223-8688

ANALYSIS REQUESTED

Page  
1 of 1

MAV #

7 2 0

REMARKS:

CLIENT NAME *Lincoln Applied Geology, Inc.*  
ADDRESS *RD 1 Box 710 Bristol, VT 05443*  
PROJECT NAME *DeCelle's Market*  
PROJECT NUMBER  
PROJECT MANAGER *Bill Norland*  
AMPLER *- same -*

✓ BTEX + MTBE

Sample Location	Date	Time	# of cont.	pres ervd	Sample Type																
<i>Trip Blank</i>	<i>10/28/93</i>	<i>0745</i>	<i>2</i>	<i>HCl</i>	<i>Water</i>																
<i>MW-1</i>	<i>10/28/93</i>	<i>1308</i>	<i>2</i>	<i>HCl</i>	<i>Water</i>																

7620 TRIP

7620-MW 1

Relinquished by: <i>William Norland</i>	Received by: <i>Kevin Danner</i>	Date/Time <i>10/28/93 2:43pm</i>	Relinquished by:	Received by:	Date/Time
--	-------------------------------------	-------------------------------------	------------------	--------------	-----------

8022231468

MICROASSAYS

P10