

APR 29 1992

Please note change of address:  
P.O. Box 1760  
205 Main Street  
Battleboro, VT 05302  
~~217 Main Street  
Battleboro, VT 05301~~



(802) 254-3677 (24 hrs.)  
(802) 254-7630 (FAX)

April 28, 1992

Ms. Cindy Woods  
Hazardous Materials Management Division  
Department of Environmental Conservation  
103 South Main Street  
Waterbury, VT 05671-0404

Re: Rockingham Bus Depot, Rockingham (Site #91-1122)

Dear Ms. Woods:

Enclosed please find a summary report for the subsurface investigation performed at the above-referenced site.

If you have any questions or require further information, please call me at 254-3677.

Sincerely,  
*Paul D.G. Miller*  
Paul D.G. Miller  
Hydrogeologist

:PDGM/mfc

Enclosure

cc: E. Fontaine

\\220\woods.jet

Branch Office:  
25 Pinney Street, Ellington, CT 06029 (203)875-2110 (24 hrs.)  
Fax: (203)875-8587 (24 hrs.)

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(802) 254-3677 (24 hrs.)  
(802) 254-7630 (FAX)

## Summary Report

### Rockingham Bus Depot Subsurface Investigation

*for*

Rockingham School District  
8 1/2 Atkinson Street  
Bellows Falls, Vermont 05101

April 28, 1992

Branch Office:  
25 Pinney Street, Ellington, CT 06029 (203) 875-2110 (24 hrs.)  
Fax: (203) 875-8587 (24 hrs.)

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## **MONITORING WELL INSTALLATION**

Monitoring well installation at the Rockingham Bus Depot site occurred on February 19, 1992. A total of three wells was installed. One well was located in the area of the UST excavation, one was located downgradient of the excavation, and the last located between the excavation and the neighboring Haynam residence. Ultimate placement of the wells was dictated by the thick woods and steep bank located just to the northeast of the excavation area. The placement of these wells is shown in Figure 1 ("Groundwater Potentiometric Map").

Using a hollow-stem auger drill rig, soil borings for groundwater monitoring wells were advanced until five feet of groundwater were encountered. Soils encountered during drilling are described in Appendix A ("Soil Boring/Monitoring Well Construction Logs").

During the soil boring activity, an organic vapor meter (OVM) was used for the dual purpose of detecting any volatile organic compound (VOC) concentrations in the soil and for monitoring VOCs in the ambient air of the drilling area. No VOC concentrations were noted in any of the soils from any of the soil borings. Also, VOC concentrations were low enough in the ambient air that it was not necessary to don respiratory protection as per TRI-S Environmental Consulting's Health and Safety Plan.

Monitoring wells installed consisted of 2" diameter, schedule 40 PVC pipe. Screens for each well consisted of 10 slot (0.010") PVC. Grade 1 silica sand was used as a sand pack around the screened portion of the well. Bentonite was used in each well to seal off any surface water drainage which might travel down the outside of the well casing. Seven inch diameter, cast iron well caps were cemented in at ground level over each well. Additionally, expansion caps were placed over the ends of the PVC wells. Well construction details for each monitoring well are shown in Appendix A.

## **HYDROGEOLOGIC INFORMATION**

Groundwater elevations from the three monitoring wells were gauged on February 26, 1992. Using these groundwater elevations, a groundwater potentiometric map was constructed (see Figure 1). As shown on this map, groundwater flow is toward the north/northeast direction. The groundwater gradient in the mapped area is approximately 3.6%, or a change of approximately 1 foot in elevation for each 27.5 feet in distance.

The Haynam residence and particularly the Haynam water supply is located approximately 212 feet to the southeast of the UST excavation area (see Figure 2, "Topographic Map"). Please note

that the buildings marked on the topographic map are not in the same location as that determined in the field. For example, the topographic map shows a distance of roughly 50 feet between the Bus Depot and Haynam buildings whereas the distance determined on the ground is approximately 108 feet. With groundwater at the site flowing to the north/northeast (determined through one set of gauging data), this places the Haynam residence and their water supply upgradient of the excavation area. It appears that any subsurface contamination at the Bus Depot site, if present, would have flowed preferentially toward the unnamed brook flowing north along the west side of Golden Hill Road.

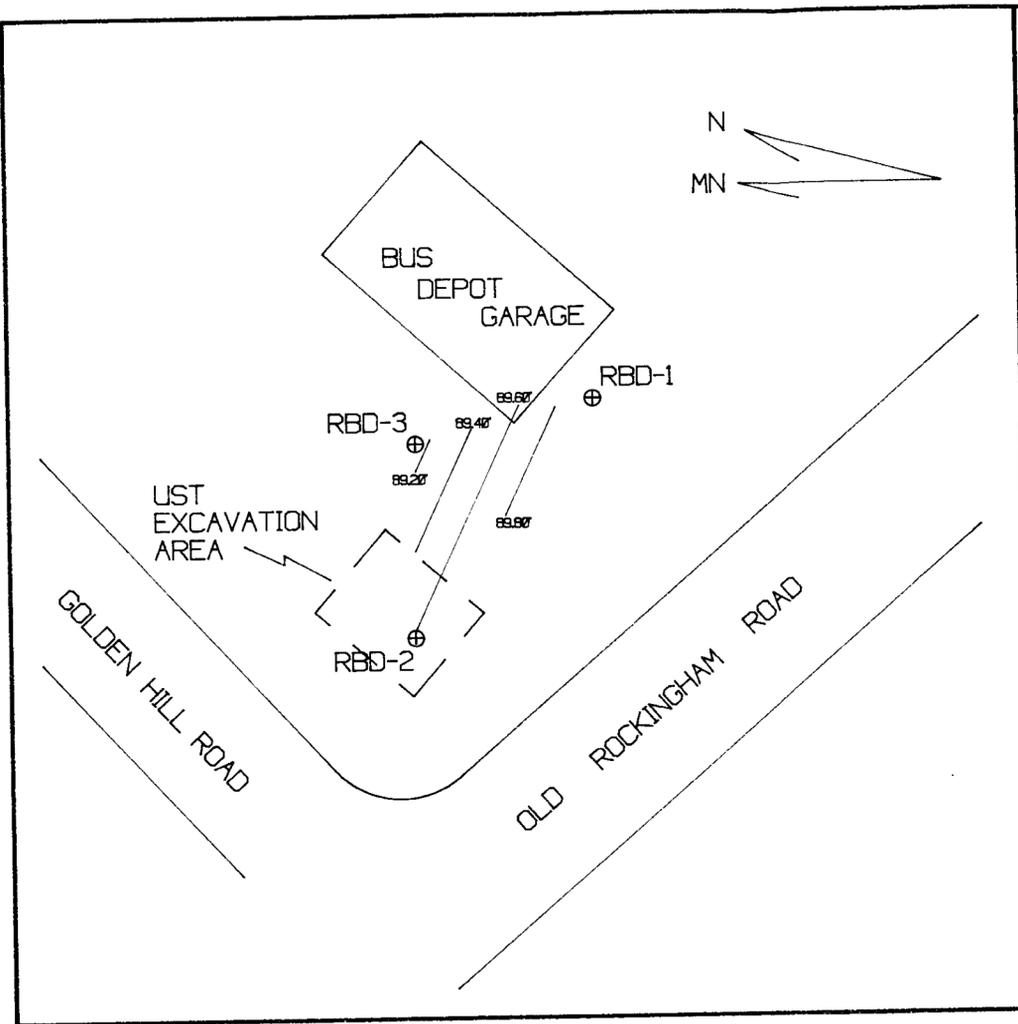
#### **GROUNDWATER QUALITY**

Monitoring wells RBD-1, RBD-2, and RBD-3 were sampled on February 26, 1992. Before sampling, five bore-volumes of water were removed from each of the three wells. Between sampling of wells, the bailer used for sample extraction was rinsed with distilled water, washed with a detergent trade-named Liquinox, and then rinsed again with distilled water. QA/QC samples, including a trip blank, field blank and duplicate, were taken as well. All samples were placed in clean VOA vials and stored with ice in a cooler for subsequent shipment to Matrix Analytical Laboratory. The samples were sent out for laboratory analysis by EPA Method 8020 on February 28, 1992. Laboratory results were received March 10, 1992 and are shown in Appendix B.

Water analyses from all three wells showed non-detectable levels for all parameters analyzed under EPA Method 8020. Due to these non-detectable contaminant concentrations, an isoconcentration map was not constructed.

**FIGURE 1**

**GROUNDWATER POTENTIOMETRIC MAP**



GROUNDWATER POTENTIOMETRIC  
MAP FOR 2/26/92

ROCKINGHAM BUS DEPOT  
OLD ROCKINGHAM ROAD  
ROCKINGHAM, VERMONT

LEGEND

⊕ RBD-1 MONITORING WELL RBD-1

— GROUNDWATER CONTOUR  
AT 89.80 FEET  
( CONTOUR INTERVAL OF 0.20 FEET )

MONITORING WELL GROUNDWATER ELEVATIONS ( IN FEET )	
RBD-1	89.98
RBD-2	89.62
RBD-3	89.13

SCALE 1 : 240

0 20 40 60 FEET

PREPARED BY:  
TRI-S ENVIRONMENTAL CONSULTING, INC.  
P.O. BOX 1760, 205 MAIN STREET  
BRATTLEBORO, VT 05302

**FIGURE 2**

**TOPOGRAPHIC MAP**



**APPENDIX A**

**SOIL BORING/MONITORING WELL CONSTRUCTION LOGS**

**TRI-S ENVIRONMENTAL CONSULTING**  
SOIL BORING / MONITORING WELL LOG

WELL NUMBER RBS-1

SHEET No. 2 of 2

CLIENT ROCKINGHAM SCHOOL DISTRICT DATE DRILLED 2/19/92 DRILLING METHOD HSA  
 PROJECT NAME ROCKINGHAM BUS DEPOT WELL TOP ELEV. 99.765' TOTAL DEPTH OF WELL 15.0'  
 PROJECT # 220 PVC ELEV. 99.45' SCREEN DIA. 2" LENGTH 10.0'  
 WELL LOCATION SEE ENCLOSED MAP GROUND ELEV. 99.765' RISER DIA. 2" LENGTH 5.0'  
 DRILLING CO. FK DRILLING DRILLER KEVIN KENNEDY SLOT SIZE 10  
 LOG BY PAUL A.G. MILLER

DEPTH FEET	SAMPLE			FIELD CLASSIFICATION AND REMARKS	FIELD TESTING	EQUIPMENT INSTALLED
	No.	REV. REC.	DEPTH FT.			
				TAN FINE SAND	ND	RISER 1.0' ROADBOX NATIVE BACKFILL 3.0' BENT 4.0'
5				BROWN FINE TO COARSE SAND, SOME FINE GRAVEL	ND	
10				BROWN-GRAY FINE SAND AND SILT	ND	SCREEN GRADE 1 SILICA SAND
				BROWN-GRAY SILT, SOME FINE GRAVEL, LITTLE FINE SAND	ND	
15				GRAY CLAY AND SILT, LITTLE FINE GRAVEL	ND	
				END OF BORING		15.0'
20						
25						
30						
35						
40						

**NOTES:**

1. FIELD TESTING PERFORMED USING A THERMO ENVIRONMENTAL INSTRUMENTS INC. ORGANIC VAPOR METER (OVM), MODEL 5828. METER RESPONSE IN PPM.
2. ND INDICATES NON-DETECTABLE CONTAMINANT CONCENTRATIONS ON OVM.
3. SAMPLES COLLECTED USING A SPLIT SPOON SAMPLER UNLESS OTHERWISE INDICATED.
4. SPLIT SPOON SAMPLER HAS A 2" DIAMETER AND IS DRIVEN USING A 140 LB. HAMMER FALLING 30 INCHES.
5. HSA = HOLLOW STEM AUGER  
AR = AIR ROTARY

TRI-S ENVIRONMENTAL CONSULTING  
SOIL BORING / MONITORING WELL LOG

WELL NUMBER RBD-2

SHEET No. 1 of 1

CLIENT ROCKINGHAM SCHOOL DISTRICT DATE DRILLED 2/19/92 DRILLING METHOD HSA  
 PROJECT NAME ROCKINGHAM BUS DEPOT WELL TOP ELEV. 100.00' TOTAL DEPTH OF WELL 15.0'  
 PROJECT # 220 PVC ELEV. 99.785' SCREEN DIA. 2" LENGTH 10.0'  
 WELL LOCATION SEE ENCLOSED MAP GROUND ELEV. 100.00' RISER DIA. 2" LENGTH 5.0'  
 DRILLING CO. T-K DRILLING DRILLER KEVIN KENNEY SLOT SIZE 10  
 LOG BY PAUL D.G. MILLER

DEPTH	SAMPLE			FIELD CLASSIFICATION AND REMARKS	FIELD TESTING	EQUIPMENT INSTALLED	
	No.	PEN/REC	DEPTH (FT)			BLOWS/6"	
0							
5				BROWN FINE TO COARSE SAND, SOME FINE TO COARSE GRAVEL (FILL)	ND	RISER	1.0' ROADBOX NATIVE 3.0' BACKFILL 4.0' BENT.
10				BROWN FINE SAND AND SILT, SOME FINE GRAVEL	ND	SCREEN	GRADE 1 SILICA SAND
15				GRAY CLAY AND SILT, LITTLE FINE GRAVEL END OF BORING	ND		15.0'
20							
25							
30							
35							
40							

NOTES:

1. FIELD TESTING PERFORMED USING A THERMO ENVIRONMENTAL INSTRUMENTS INC. ORGANIC VAPOR METER (OVM), MODEL 5802B. METER RESPONSE IN PPM.
2. ND INDICATES NON-DETECTABLE CONTAMINANT CONCENTRATIONS ON OVM.
3. SAMPLES COLLECTED USING A SPLIT SPOON SAMPLER UNLESS OTHERWISE INDICATED.
4. SPLIT SPOON SAMPLER HAS A 2" DIAMETER AND IS DRIVEN USING A 140 LB. HAMMER FALLING 30 INCHES.
5. HSA = HOLLOW STEM AUGER  
AR = AIR ROTARY

**TRI-S ENVIRONMENTAL CONSULTING**  
SOIL BORING / MONITORING WELL LOG

WELL NUMBER R86-3

SHEET No. 1 of 1

CLIENT <u>ROCKINGHAM SCHOOL DISTRICT</u>	DATE DRILLED <u>2/19/92</u>	DRILLING METHOD <u>HSA</u>
PROJECT NAME <u>ROCKINGHAM BUS DEPOT</u>	WELL TOP ELEV. <u>99.29'</u>	TOTAL DEPTH OF WELL <u>15.0'</u>
PROJECT # <u>220</u>	PVC ELEV. <u>98.97'</u>	SCREEN DIA. <u>2"</u> LENGTH <u>10.0'</u>
WELL LOCATION <u>SEE ENCLOSED MAP</u>	GROUND ELEV. <u>99.29'</u>	RISER DIA. <u>2"</u> LENGTH <u>5.0'</u>
DRILLING CO. <u>T-K DRILLING</u>	DRILLER <u>KEVIN KENNEDY</u>	SLOT SIZE <u>10</u>
LOG BY <u>PAUL D.G. MILLER</u>		

DEPTH	SAMPLE				FIELD CLASSIFICATION AND REMARKS	FIELD TESTING	EQUIPMENT INSTALLED
	No.	PEN/REC.	DEPTH (FT)	BLOWS/5'			
0					BROWN FINE TO COARSE SAND AND FINE GRAVEL	ND	RISER 1.0' ROADBOX NATIVE 3.0' BACKFILL 4.0' BENT.
5							
10							
15					BROWN FINE SAND AND SILT, LITTLE FINE GRAVEL	ND	SCREEN GRADE 1 SILICA SAND
20					BROWN FINE TO COARSE SAND AND FINE TO MEDIUM GRAVEL	ND	
25					GRAY CLAY AND SILT, LITTLE FINE GRAVEL	ND	
30					END OF BORING		15.0'
35							
40							

**NOTES:**

1. FIELD TESTING PERFORMED USING A THERMO ENVIRONMENTAL INSTRUMENTS INC. ORGANIC VAPOR METER, IOVMI MODEL 5802L METER RESPONSE IN PPM.
2. ND INDICATES NON-DETECTABLE CONTAMINANT CONCENTRATIONS ON OVM.
3. SAMPLES COLLECTED USING A SPLIT SPOON SAMPLER UNLESS OTHERWISE INDICATED.
4. SPLIT SPOON SAMPLER HAS A 2" DIAMETER AND IS DRIVEN USING A 140 LB. HAMMER FALLING 30 INCHES.
5. HSA = HOLLOW STEM AUGER  
AR = AIR ROTARY

**APPENDIX B**

**LABORATORY RESULTS**



Matrix Analytical, Inc.  
 106 South Street  
 Hopkinton, MA 01748  
 1 800 3-MATRIX

**F I N A L   R E P O R T**

**Client Information**

Account: TRI-S Environmental Consulting  
 Address: 214 Main Street  
 Brattleboro, VT 05301

Project Name: Rockingham, Vt (220) (2-28-92)  
 Project Number: 220  
 Project Manager:  
 Sampler Name: Tri-S Environmental

**Sample Information**

Lab ID: 20591160-001  
 Client Id: RBD-1  
 Matrix: Water

Date Sampled: 02/26/92 13:00  
 Date Received: 02/28/92 : 0  
 Date Reported: 03/05/92

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
<b><u>VOLATILE ORGANICS</u></b>						
Benzene	ND	ug/l	1	8020	tf	03/04/92
Chlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,2-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,3-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,4-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
Ethylbenzene	ND	ug/l	1	8020	tf	03/04/92
MTBE	ND	ug/l	5	8020	tf	03/04/92
Toluene	ND	ug/l	1	8020	tf	03/04/92
Xylene	ND	ug/l	1	8020	tf	03/04/92
<b><u>SURROGATE STUDIES - VOLATILES</u></b>						
Bromofluorobenzene	87	Percent			tf	03/04/92

RBD-1



Matrix Analytical, Inc.  
 106 South Street  
 Hopkinton, MA 01748  
 1 800 3-MATRIX

**F I N A L   R E P O R T**

**Client Information**

Account: TRI-S Environmental Consulting  
 Address: 214 Main Street  
 Brattleboro, VT 05301

Project Name: Rockingham, Vt (220) (2-28-92)  
 Project Number: 220  
 Project Manager:  
 Sampler Name: Tri-S Environmental

**Sample Information**

Lab ID: 20591160-002  
 Client Id: RBD-2  
 Matrix: Water

Date Sampled: 02/26/92 13:05  
 Date Received: 02/28/92 : 0  
 Date Reported: 03/05/92

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
<b><u>VOLATILE ORGANICS</u></b>						
Benzene	ND	ug/l	1	8020	tf	03/04/92
Chlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,2-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,3-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,4-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
Ethylbenzene	ND	ug/l	1	8020	tf	03/04/92
MTBE	ND	ug/l	5	8020	tf	03/04/92
Toluene	ND	ug/l	1	8020	tf	03/04/92
Xylene	ND	ug/l	1	8020	tf	03/04/92
<b><u>SURROGATE STUDIES - VOLATILES</u></b>						
Bromofluorobenzene	89	Percent			tf	03/04/92

RBD-2



Matrix Analytical, Inc.  
 106 South Street  
 Hopkinton, MA 01748  
 1 800 3-MATRIX

**F I N A L   R E P O R T**

**Client Information**

Account: TRI-S Environmental Consulting  
 Address: 214 Main Street  
 Brattleboro, VT 05301

Project Name: Rockingham, Vt (220) (2-28-92)  
 Project Number: 220  
 Project Manager:  
 Sampler Name: Tri-S Environmental

**Sample Information**

Lab ID: 20591160-003  
 Client Id: RBD-3  
 Matrix: Water

Date Sampled: 02/26/92 13:10  
 Date Received: 02/28/92 :0  
 Date Reported: 03/05/92

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
<b><u>VOLATILE ORGANICS</u></b>						
Benzene	ND	ug/l	1	8020	tf	03/04/92
Chlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,2-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,3-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,4-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
Ethylbenzene	ND	ug/l	1	8020	tf	03/04/92
MTBE	ND	ug/l	5	8020	tf	03/04/92
Toluene	ND	ug/l	1	8020	tf	03/04/92
Xylene	ND	ug/l	1	8020	tf	03/04/92
<b><u>SURROGATE STUDIES - VOLATILES</u></b>						
Bromofluorobenzene	83	Percent			tf	03/04/92

RBD-3



Matrix Analytical, Inc.  
 106 South Street  
 Hopkinton, MA 01748  
 1 800 3-MATRIX

**F I N A L   R E P O R T**

**Client Information**

Account: TRI-S Environmental Consulting  
 Address: 214 Main Street  
 Brattleboro, VT 05301

Project Name: Rockingham, Vt (220) (2-28-92)  
 Project Number: 220  
 Project Manager:  
 Sampler Name: Tri-S Environmental

**Sample Information**

Lab ID: 20591160-004  
 Client Id: Dup  
 Matrix: Water

Date Sampled: 02/26/92 13:11  
 Date Received: 02/28/92 : 0  
 Date Reported: 03/05/92

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
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VOLATILE ORGANICS

Benzene	ND	ug/l	1	8020	tf	03/04/92
Chlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,2-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,3-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,4-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
Ethylbenzene	ND	ug/l	1	8020	tf	03/04/92
MTBE	ND	ug/l	5	8020	tf	03/04/92
Toluene	ND	ug/l	1	8020	tf	03/04/92
Xylene	ND	ug/l	1	8020	tf	03/04/92

SURROGATE STUDIES - VOLATILES

Bromofluorobenzene	92	Percent			tf	03/04/92
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RBA-3  
 DUPLICATE



Matrix Analytical, Inc.  
 106 South Street  
 Hopkinton, MA 01748  
 1 800 3-MATRIX

**F I N A L   R E P O R T**

**Client Information**

Account: TRI-S Environmental Consulting  
 Address: 214 Main Street  
 Brattleboro, VT 05301

Project Name: Rockingham, Vt (220) (2-28-92)  
 Project Number: 220  
 Project Manager:  
 Sampler Name: Tri-S Environmental

**Sample Information**

Lab ID: 20591160-005  
 Client Id: TB  
 Matrix: Water

Date Sampled: 02/26/92 09:05  
 Date Received: 02/28/92 :0  
 Date Reported: 03/05/92

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
<b><u>VOLATILE ORGANICS</u></b>						
Benzene	ND	ug/l	1	8020	tf	03/04/92
Chlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,2-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,3-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,4-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
Ethylbenzene	ND	ug/l	1	8020	tf	03/04/92
MTBE	ND	ug/l	5	8020	tf	03/04/92
Toluene	ND	ug/l	1	8020	tf	03/04/92
Xylene	ND	ug/l	1	8020	tf	03/04/92
<b><u>SURROGATE STUDIES - VOLATILES</u></b>						
Bromofluorobenzene	92	Percent			tf	03/04/92

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Matrix Analytical, Inc.  
 106 South Street  
 Hopkinton, MA 01748  
 1 800 3-MATRIX

**F I N A L R E P O R T**

**Client Information**

Account: TRI-S Environmental Consulting  
 Address: 214 Main Street  
 Brattleboro, VT 05301

Project Name: Rockingham, Vt (220) (2-28-92)  
 Project Number: 220  
 Project Manager:  
 Sampler Name: Tri-S Environmental

**Sample Information**

Lab ID: 20591160-006  
 Client Id: FB  
 Matrix: Water

Date Sampled: 02/26/92 13:18  
 Date Received: 02/28/92 : 0  
 Date Reported: 03/05/92

Analytical Parameter	Result	Unit	Detection Limit	Method No.	Analyst	Date Analyzed
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**VOLATILE ORGANICS**

Benzene	ND	ug/l	1	8020	tf	03/04/92
Chlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,2-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,3-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
1,4-Dichlorobenzene	ND	ug/l	1	8020	tf	03/04/92
Ethylbenzene	ND	ug/l	1	8020	tf	03/04/92
MTBE	ND	ug/l	5	8020	tf	03/04/92
Toluene	ND	ug/l	1	8020	tf	03/04/92
Xylene	ND	ug/l	1	8020	tf	03/04/92

**SURROGATE STUDIES - VOLATILES**

Bromofluorobenzene	86	Percent			tf	03/04/92
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FIELD  
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