GROSSMAN'S PROPERTY SITE INVESTIGATION
SOUTH BURLINGTON, VERMONT

March 1994

Prepared for:

POMERLEAU REAL ESTATE
69 College Street
Burlington, Vermont 05401

Prepared by:

THE JOHNSON COMPANY, INC.
5 State Street
Montpelier, Vermont 05602
(802) 229-4600

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering

March 17, 1994

Mr. Richard Bushnell
Pomerleau Real Estate
69 College Street
Burlington, Vermont 05401

Re: Grossman's Property Site Investigation, South Burlington, Vermont
JCO # 1-1650-6 (042)

Dear Dick:

Enclosed is our report for the soil and groundwater investigation of the Grossman's property, conducted in December 1993 through February 1994. When you have had a chance to review the report, please give me a call if you have any questions. We will submit a copy of this report to the Sites Management Section of the Vermont Department of Environmental Conservation when you direct us to do so.

Sincerely,

THE JOHNSON COMPANY, INC.

BY: Bradley A. Wheeler
Bradley A. Wheeler, CPSS
Senior Scientist

Civil Environmental Engineering Hydrogeology Water Supply & Wastewater Design and Hazard & Waste Remediation Hydrology Contaminant Fate Analysis
5 State Street Montpelier, VT 05602 ■ (802) 229-4600 Fax: (802) 229-5876

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1.0 INTRODUCTION

On December 16, 1993, and January 6 and 8, 1994, a subsurface investigation was carried out at the Grossman's property on Bartlett Bay Road in South Burlington, Vermont. (See Figure 1) The purpose of this investigation was to better define the extent of the #2 fuel oil contamination which was discovered on October 28, 1993 during the removal of a 5,000 gallon underground #2 fuel oil storage tank (UST). The investigation included five soil borings for soil sampling and installation of two monitoring wells for groundwater sampling, and laboratory analysis of soil and groundwater samples from three of the borings. The drilling contractors for this investigation were Green Mountain Boring and Tri-State Drilling and Boring.

2.0 SOIL BORINGS AND GROUNDWATER MONITORING WELL INSTALLATION

The first soil boring (SB-1 on Figure 2) was completed on December 16, 1993. Due to an equipment breakdown, this was the only boring completed on this day. SB-1 is located approximately 40 feet from the excavation completed for the UST removal. It is east of the former UST location, which we assume is hydrologically upgradient (i.e. groundwater flow direction at this site is assumed to be west, toward Lake Champlain) of the excavation. The auger spoil, air space and split spoon soil samples (which were collected at 5 foot intervals) were screened for volatile organic compounds (VOCs) with a Thermo Environmental Model 580B OVM (PID) which was calibrated on site prior to drilling. The soil samples were screened using a plastic bag PID headspace analysis method. No VOCs were detected with the PID from any soil samples collected from this boring. The soils in this location are silty clay. The total depth drilled for SB-1 was 15 feet. Groundwater was encountered at a depth of approximately 13 feet. In accordance with the site work plan, because no VOCs were detected with the PID, a groundwater monitoring well was not installed in this boring. Instead, a sample of saturated soil was collected for laboratory analysis for aromatic hydrocarbons using EPA Method 8020 and for total petroleum hydrocarbons using EPA Method 418.1. The laboratory used for this analysis was Microassays of Vermont, Inc. of Middlesex, Vermont.

The second soil boring was completed approximately 42 feet from the excavation completed for the UST removal. A groundwater monitoring well was installed in this boring. It is shown on Figure 2 as MW-1. MW-1 is west of the former UST location, which we assume is hydrologically downgradient of the excavation. The PID headspace screening results from this boring were as follows: 0.6 parts per million (ppm) from 4.5 to 6.5 feet below ground surface (bgs), 6.6 ppm from 9.5 to 11.5 feet bgs, and 6.0 ppm from 14.5 to 16.5 feet bgs. Groundwater was encountered at approximately 11 feet bgs. The soil textures encountered in this boring were predominantly silty clay. As the work plan indicated, the decision to install a monitoring well in this boring was based on the fact that we obtained positive PID readings in the soil sample collected from this boring at the water table.

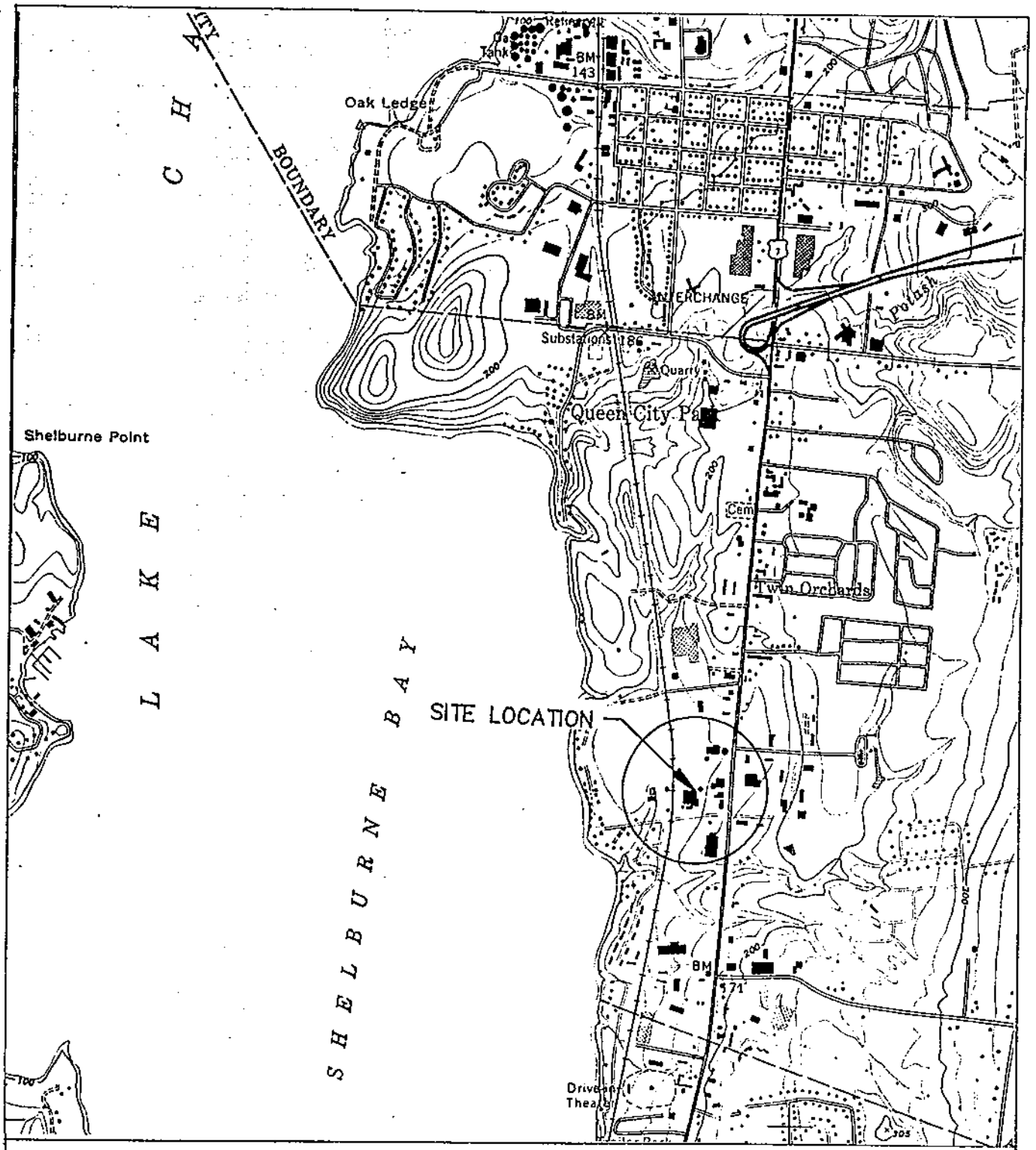
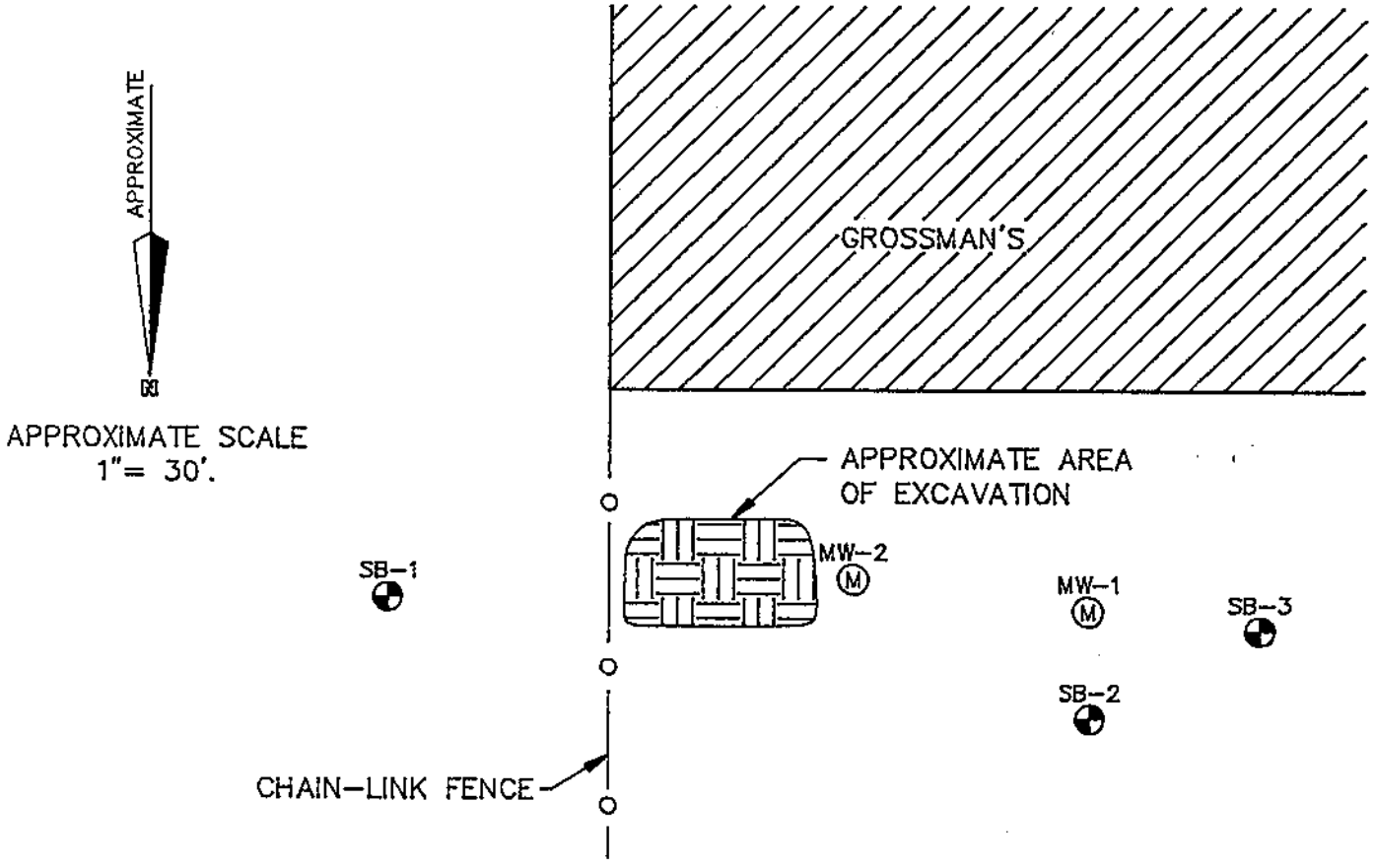


Figure 1

BASE MAP : USGS 7.5 Minute Topographic Quadrangle: Burlington, Vermont (1948, Photorevised 1987)

Site Location Map Grossman's Property South Burlington, Vermont	THE JOHNSON COMPANY Environmental Sciences and Engineering MONTPELIER, VERMONT



LEGEND

SB-1 SOIL BORING LOCATION

MW-2 (M) MONITORING WELL LOCATION

Figure 2

NOTES

ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE.
NOT TO SCALE.

SITE SKETCH GROSSMAN'S PROPERTY SOUTH BURLINGTON, VERMONT	THE JOHNSON COMPANY, INC. Environmental Sciences and Engineering MONTPELIER, VERMONT

1-1650-6\SKETCH

The bottom of MW-1 was set at 14 feet bgs. Five feet of screened section with a 0.01 inch slot was used. The well was sand packed from 14 feet to 7.5 feet bgs. A two foot thick bentonite plug was installed above the sand pack. Fill was placed around the remaining well riser, to within one foot of the ground surface. An above-grade steel well guard was cemented into place to complete the well installation.

The third boring, labeled MW-2 on Figure 2 , was completed approximately five feet west of the excavation area of the former UST. The soils sampled from 4.5-6.5 feet bgs produced plastic bag headspace PID readings of 18 ppm. A reading of 14.6 ppm was obtained from the soil sample from 9.5-11.5 feet bgs. At 14.5-16.5 feet bgs, the PID headspace reading was 8.2 ppm. The soils were saturated at a depth of approximately 14 feet bgs.

A groundwater monitoring well was installed in this boring. The bottom of the well was placed at approximately 19 feet bgs. A ten foot section of well screen with a 0.01 inch slot was used. The well was packed with sand to a depth of 7.5 feet bgs. A two foot thick plug of bentonite chips was installed above the sand pack. An above-grade steel well guard was cemented into place to complete the well installation.

Two additional borings, SB-2 and SB-3, were completed on January 8, 1994. As shown on Figure 2, these borings were located approximately 45 feet northwest (SB-2) and 70 feet west (SB-3) of the former location of the UST. The purpose of these borings was to further define the extent of the fuel oil contamination on the site. Monitoring wells were not installed in these borings, as per the preapproved site work plan.

Boring SB-2 was drilled to a depth of 11.5 feet bgs. Soil samples were collected with a split spoon sampler at 4.5-6.5 feet bgs and from 9.5-11.5 feet bgs. PID headspace analysis of these samples provided readings of 0.0 ppm. The lower soil sample was saturated, indicating the presence of the groundwater table.

Boring SB-3 was also drilled to a depth of 11.5 feet bgs. Soil samples were collected with a split spoon sampler at 4.5-6.5 feet bgs and from 9.5-11.5 feet bgs. PID headspace analysis of these samples provided readings of 0.0 ppm for the upper sample and 2.0 for the lower sample. The lower soil sample was saturated, indicating the presence of the groundwater table.

3.0 SAMPLING AND LABORATORY ANALYTICAL RESULTS

3.1 SOIL SAMPLE

The saturated soil sample from SB-1 was analyzed at Microassays for aromatic hydrocarbons using EPA Method 8020 and for total petroleum hydrocarbons using EPA Method 418.1. The results of the 8020 analysis were: 51 parts per billion (ppb) toluene, 11 ppb total xylenes and 7 parts per billion methyl tertiary butyl ether (MTBE). The Vermont Groundwater Protection Rule and Strategy Enforcement Standards for these compounds are 2,420 ppb for toluene and 400 ppb for xylenes. There is no enforcement standard for MTBE. The State of Vermont Drinking Water Health Advisories, dated February 1, 1994, list a health advisory of 40 ppb for MTBE. There are no standards for contaminants in soil, but the "rule of thumb" guideline used by the Vermont Department of Environmental Conservation for soils is 20 times the groundwater enforcement standard. Therefore, the soil rule of thumb guideline enforcement standard would be 48,400 ppb for toluene and 8,000 ppb for xylenes, and if the Drinking Water Health Advisory for MTBE was used for this, the soil standard for MTBE would be 800 ppb.

The results of the 418.1 analysis were below the method detection limit of 5 ppm, in other words, no petroleum hydrocarbon compounds were detected by this analysis.

3.2 GROUNDWATER SAMPLES

The groundwater was sampled from MW-1 and MW-2 on January 12, 1994. The groundwater was analyzed by Microassays for aromatic hydrocarbons using EPA Method 8020 and for total petroleum hydrocarbons using EPA Method 418.1. The 8020 analysis did not detect any of its listed analytes in either sample. The laboratory routinely conducts a mass spectrometer verification for their own quality control/quality assurance, and this was done on this sample. This procedure detected the presence of dichlorodifluoromethane (Freon-12) in both of the groundwater samples (from MW-1 and MW-2) at concentrations of approximately 1,000 ppb.

The reported results of the EPA Method 418.1 analysis for both samples were below the practical quantitation limit of 1 ppm.

Based on the unexpected detection of the Freon-12 in the groundwater samples from MW-1 and MW-2, the groundwater was resampled on February 4, 1994. The samples were analyzed at Scitest Laboratory for volatile organic compounds using EPA Method 8240. Freon-12 was detected in both of the samples; at concentrations of 1,250 ppb in MW-1 and 1,840 in MW-2. Additionally, a laboratory library search of an unknown peak in MW-1 yielded a 50% probability match with cyclopropane.

Table 1 provides a summary of the laboratory analytical data for the soil and groundwater samples collected from this site.

TABLE 1: SUMMARY OF SOIL AND GROUNDWATER ANALYTICAL DATA
(units are parts per billion)

COMPOUND	SB-1[1]	MW-1 1/12/94	MW-1 2/4/94	MW-2 1/12/94	MW-2 2/4/94	STANDARD[2]
Benzene	BPQL[3]	BPQL	BPQL	BPQL	BPQL	5
Toluene	51	BPQL	BPQL	BPQL	BPQL	2,420
Ethyl-benzene	BPQL	BPQL	BPQL	BPQL	BPQL	680
Xylenes	11	BPQL	BPQL	BPQL	BPQL	400
MTBE[4]	7	BPQL	BPQL	BPQL	BPQL	N/A[5]
TPH[6]	BPQL	N/A	N/A	N/A	N/A	N/A
Freon-12[7]	N/A	1,000[8]	1,250	1,000[8]	1,840	N/A

1 Soil sample; MW-1 and MW-2 are groundwater samples
2 Vermont Groundwater Protection Rule and Strategy Enforcement Standards
3 BPQL - Below Practical Quantitation Limit
4 MTBE - methyl tertiary butyl ether
5 N/A - Not Applicable
6 TPH - Total Petroleum Hydrocarbons
7 Freon-12 - Dichlorodifluoromethane
8 This is an approximate value.

4.0 DISCUSSION

The data obtained from this investigation provided some unexpected results which warrant further discussion and evaluation. The key issues for discussion are:

1. What is the origination of the MTBE detected in the soil sample from SB-1?

2. What is the explanation for the absence of any of the petroleum related compounds that were expected to be present in the groundwater samples?

3. What is the origination of the Freon-12 detected in the groundwater samples collected from both MW-1 and MW-2?

MTBE is a gasoline additive that was not in use in the northeast until approximately 1986. The closest known gasoline UST in this area (which was located approximately 350 feet east of the location of SB-1) was removed from the Jiffy-Lube property in July 1993. This property also belongs to Pomerleau Real Estate, and the UST removal assessment and subsequent site investigation was performed by The Johnson Company. This 4,000 gallon UST had been out of use for over 10 years, so gasoline that had been stored in it would not have contained MTBE. After the UST had been removed, a soil sample was collected from the saturated zone of a boring approximately 90 feet downgradient of the former location of the UST. This boring was located directly between this gasoline UST and the area where SB-1 was conducted on the Grossman's property. No MTBE was detected in this sample, which was analyzed using EPA Method 8020. Low concentrations of toluene, ethylbenzene and xylenes were detected in this soil sample. This information essentially rules out the Jiffy-Lube property as the source for the MTBE contamination reported in the soil sample from SB-1. The source of this contamination is unknown. It is not likely that the source of the toluene and xylenes is from the Grossman's UST because SB-1 is located in an upgradient position relative to the former UST location.

During the soil boring and monitoring well installation process for MW-1 and MW-2, the groundwater was identified at 11 feet bgs and approximately 14 feet bgs respectively. MW-1 was constructed with a five foot screened section that was placed from 9 to 14 feet bgs. MW-2 was constructed with a ten foot screened section that was placed from 9 to 19 feet bgs. This longer screened section was used in MW-2 because of the discrepancy in groundwater depth between these two borings, which are only approximately 37 feet apart. The ten foot screened section was used as a precaution from screening the well below the upper portion of the water table, just in case it was actually closer to the 11 foot depth seen in MW-1.

However, when the groundwater was sampled from these wells on January 12, the groundwater was only 5.05 feet bgs in MW-1 and 4.20 feet bgs in MW-2. Similarly, during the February 4 sampling, the groundwater was at 4.42 feet bgs in MW-1 and 3.68 feet bgs in MW-2.

We suspect that an artesian effect is being seen here. The rationale for this is:

1. The water table levels (inferred from observations of soil moisture content) documented during drilling were 11 and 14 feet bgs in the two well borings, and at similar levels in the other three borings conducted on the site.

2. Soil sample PID headspace results for the boring for MW-1 were higher at the 9.5 to 11.5 feet depth (6.6 ppm) than at the 4.5 to 6.5 feet depth (0.6 ppm). Since fuel oil constituents are expected to be at highest concentrations at the surface of the water table, as opposed to below the water table, these PID headspace results support a water table depth of 11 feet bgs, as opposed to the 4 to 5 foot range seen during sampling.

3. A slightly sandier layer was documented in the boring for MW-2 at approximately 16 feet bgs. The soil particle size distribution was still dominated by silt and clay, but a small percentage of medium sand was apparent. This slightly coarser soil layer may represent a more permeable layer where groundwater is at a higher pressure.

If the groundwater entering MW-1 and MW-2 is artesian, it is likely flowing into the wells from the lower, more permeable soil layer at a faster rate than it does from the upper saturated soil layer, which is less permeable than the lower layer. Since petroleum constituents will be concentrated near the upper surface of the water table, if the groundwater samples obtained from these wells is actually originating from a lower soil layer, then the most highly contaminated groundwater zone may not be adequately represented in the samples. This may be a reason why the groundwater samples collected from MW-1 and MW-2 have not been found to contain any petroleum related compounds.

The source of the Freon-12 in the groundwater sampled from these wells is currently unknown. Freon-12 is a refrigerant which is used in air conditioners. The only known link to this sort of source is that the site was formerly occupied by a facility that stored and repaired, among other things, household appliances. This may have included air conditioners and refrigerators. Specific or actual use, storage or disposal of this compound on this property is not known.

5.0 CONCLUSIONS

Based on the PID headspace data obtained during this investigation, it does not appear that the fuel oil contamination on this site has spread extensively in a horizontal or vertical direction. The highest reading obtained during this investigation was from the boring for MW-2, which is approximately 5 feet downgradient of the excavation for the fuel oil UST. This reading was 18.1 ppm from the sample collected from 4.5 to 6.5 feet bgs. The sample from this same boring collected from 14.5 to 16.5 feet bgs produced a reading of 8.2 ppm. Additionally, the highest reading obtained from the boring for MW-1, which is approximately 37 feet downgradient of MW-2, was only 6.6 ppm. SB-2, which was located 17 feet north of MW-1, produced headspace readings of 0.0 ppm for both soil samples collected. SB-3, located 27 feet west of MW-1, produced headspace readings of 0.0 ppm at 4.5 to 6.5 feet bgs and 2.0 ppm at 9.5 to 11.5 feet bgs. These data suggest that fuel oil contamination is not widespread at high concentrations on this site.

In addition to the PID headspace data, no petroleum related compounds were detected in the groundwater samples collected from MW-1 or MW-2. Analysis of the groundwater included EPA Methods 418.1, 8020 and 8240. Although the validity of these samples is called into question in this report, these data do suggest that since none were detected, it is not likely that very high concentrations of petroleum related compounds are present in the groundwater.

The source of the MTBE, toluene and xylenes in the upgradient soil sample from SB-1 is unknown, but the concentrations of these compounds detected are below the Vermont Groundwater Protection Rule and Strategy Enforcement Standards.

The groundwater on the site is contaminated with dichlorodifluoromethane (Freon-12). Freon-12 was reported in the groundwater sample from MW-1 at a concentration of 1,250 ppb and from MW-2 at a concentration of 1,840 ppb. There is no Vermont Groundwater Protection Rule and Strategy Enforcement Standard for Freon-12, but the State of New Hampshire has a Groundwater Protection Rule Enforcement Standard of 1,000 ppb for Freon-12. The State of Vermont Drinking Water Health Advisories, dated February 1, 1994, list a health advisory of 1,000 ppb for Freon-12. Since there are only two data points relative to this Freon-12 contamination, it is not possible to draw any conclusions regarding the extent of this compound on the site.

6.0 RECOMMENDATIONS

Dichlorodifluoromethane (Freon-12) was detected in groundwater samples from two locations at levels in excess of the Vermont Drinking Water Health Advisory. We recommend that further sampling be undertaken to better define the nature and extent of this contamination.

Freon-12 is more dense than water, which means that in its pure form it may sink below the water table. Compounds such as Freon-12 are referred to as Dense Non-Aqueous Phase Liquids (DNAPL). DNAPLs pose significant and difficult subsurface contamination problems for the following reasons: 1) DNAPLs typically have relatively low solubilities in water but non-the-less dissolve in water at levels far in excess of health based or regulatory criteria. The DNAPL therefore dissolves very slowly over long periods of time (often hundreds of years) contaminating groundwater to unsafe levels and; 2) DNAPL is often distributed in highly complex patterns in the subsurface. Adequately characterizing the contamination is more difficult, time consuming and expensive than is the case with other types of contaminants, such as petroleum products. Cleaning up the contamination is also much more difficult and may be impossible if adequate data are not available concerning the location of the DNAPL sources in the aquifer.

With a release of a petroleum product, the contamination is normally confined to a thin zone in the aquifer immediately below the water table. The source of the dissolved contamination is either perched on the water table (or capillary fringe) or is present in the soil above the water table. Defining the extent of this type of contamination simply involves screening wells across the water table in a number of locations to determine the horizontal extent of contamination. With a DNAPL, the vertical location of the contamination is unknown. Thus, one must define the extent of contamination in three dimensions rather than two.

One scenario that strikes us as likely is that the dissolved Freon-12 is traveling in the layer of slightly coarser material below the silty clay described in Section 4.0. We have, quite accidentally, located two areas where the Freon-12 is present. We propose installing multi-level sampling devices in these locations to better determine the vertical distribution of the contaminant. While we are installing these devices, we will also install a nest of the devices at one other location to provide more horizontal coverage of the area. We propose one day of field work to install the devices at a cost of $2,300. This cost would included all materials needed for the multi-level sampling devices, as well as the costs of all personnel involved in the installations. We propose to install ten sampling points. The driller's estimated cost for this work is $1,500 for time and materials. The Johnson Company's estimated cost for this installation work is $700 for time and materials. This cost assumes that the work can be completed in one 10-hour day. Groundwater samples will be collected approximately one week after the sampling points are installed.

7.0 COST ESTIMATE FOR RECOMMENDED INVESTIGATION

We estimate the following costs for the completion of this investigation:

Drilling contractor	$1,500
Laboratory Analysis	$ 600 ($60 per sample for Freon-12)
Johnson Company	
Field Investigation	$ 800
Groundwater Sampling	$ 400
Report Preparation	$1,500
Total	$4,800

This investigative effort should provide us with data that will help us to better understand the nature of the contamination at the site. It should be noted that an investigation of this type is typically conducted in a step-wise fashion. Data developed during each step are used to guide any subsequent steps that may be necessary.

Reviewed by: SEP

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APPENDIX A

Soil Sample Laboratory Data Sheet

LABORATORY ANALYSIS

CLIENT NAME:	The Johnson Company	REF #:	7982
ADDRESS:	5 State Street	PROJECT NO.:	1-1650-6
	Montpelier, VT 05602		
SAMPLE LOCATION:	Pomerleau Real Estate	DATE OF SAMPLE:	12/16/93
SAMPLER:	Brad Wheeler	DATE OF RECEIPT:	12/16/93
		DATE OF ANALYSIS:	12/22/93
ATTENTION:	Brad Wheeler	DATE OF REPORT:	12/28/93

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

- Water samples submitted for VOC's were preserved with HCl. Soil Samples were not preserved.
- 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.
- Continuing calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were 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

EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	The Johnson Company	PROJECT CODE:	1-1650-6
PROJECT NAME:	Pomerleau Real Estate	REF.#:	7,982
REPORT DATE:	December 28, 1993	STATION:	SB-1
DATE SAMPLED:	December 16, 1993	TIME SAMPLED:	11:00
DATE RECEIVED:	December 16, 1993	SAMPLER:	Brad Wheeler
ANALYSIS DATE:	December 22, 1993	SAMPLE TYPE:	Soil

PARAMETER	PQL (µg/Kg)	Concentration (µg/Kg)
Benzene	5	BPQL
Toluene	5	51
Ethylbenzene	5	BPQL
m+p-Xylene	10	11
o-Xylene	5	BPQL
Chlorobenzene	5	BPQL
1,2-Dichlorobenzene	5	BPQL
1,3-Dichlorobenzene	5	BPQL
1,4-Dichlorobenzene	5	BPQL
MTBE	5	7

Surrogate % Recovery: 92%

BPQL = Below Practical Quantitation Limit (PQL).

MicroAssays of Vermont, Inc. P.O. Box 189 Middlesex, Vermont 05602 (802) 223-1468 FAX 223-8688

LABORATORY ANALYSIS

CLIENT NAME:	The Johnson Company	REF #:	7982
ADDRESS:	5 State Street	PROJECT NO.:	1-1650-6
	Montpelier, VT 05602		
SAMPLE LOCATION:	Pomerleau Real Estate	DATE OF SAMPLE:	12/16/93
SAMPLER:	Brad Wheeler	DATE OF RECEIPT:	12/16/93
		DATE OF ANALYSIS:	12/22/93
ATTENTION:	Brad Wheeler	DATE OF REPORT:	12/28/93

TOTAL PETROLEUM HYDROCARBONS

RESULTS:

The SB-1 soil sample was found to contain less than 5 milligrams per liter (PPM) TPH.

Reviewed by:

Brendan McMahon, Ph.D.
Director, Chemical Services

APPENDIX B

Groundwater Sample Laboratory Data Sheets - Microassays Laboratory

MICROASSAYS OF VERMONT INCORPORATED

LABORATORY ANALYSIS

CLIENT NAME:	The Johnson Company, Inc.	REF #:	8113
ADDRESS:	5 State Street	PROJECT NO.:	1-1650-6
	Montpelier, VT 05602		
SAMPLE LOCATION:	Grossman's (Pomerleau)	DATE OF SAMPLE:	1/11,1/12/94
SAMPLER:	Brad Wheeler	DATE OF RECEIPT:	1/12/94
		DATE OF ANALYSIS:	1/18/94
ATTENTION:	Brad Wheeler	DATE OF REPORT:	1/20/94

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

- Samples submitted for VOC analysis 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.
- Continuing calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were 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

EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	The Johnson Company, Inc.	PROJECT CODE:	1-1650-6
PROJECT NAME:	Pomerleau - Grossman's	REF.#:	8,113
REPORT DATE:	January 20, 1994	STATION:	MW-2
DATE SAMPLED:	January 12 1994	TIME SAMPLED:	14:10
DATE RECEIVED:	January 12, 1994	SAMPLER:	Brad Wheeler
ANALYSIS DATE:	January 18, 1993	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Concentration (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	BPQL
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	BPQL
MTBE	1	BPQL

Surrogate % Recovery: 91%

BPQL = Below Practical Quantitation Limit (PQL).

LABORATORY REPORT

EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	The Johnson Company, Inc.	PROJECT CODE:	1-1650-6
PROJECT NAME:	Pomerleau - Grossman's	REF.#:	8,113
REPORT DATE:	January 20, 1994	STATION:	MW-1
DATE SAMPLED:	January 12 1994	TIME SAMPLED:	13:25
DATE RECEIVED:	January 12, 1994	SAMPLER:	Brad Wheeler
ANALYSIS DATE:	January 18, 1993	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Concentration (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	BPQL
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	BPQL
MTBE	1	BPQL

Surrogate % Recovery: 99%

BPQL = Below Practical Quantitation Limit (PQL).

MicroAssays of Vermont, Inc. P.O. Box 189 Middlesex, Vermont 05602 (802) 223-1468 FAX 223-8688

LABORATORY REPORT

EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	The Johnson Company, Inc.	PROJECT CODE:	1-1650-6
PROJECT NAME:	Pomerleau - Grossman's	REF.#:	8,113
REPORT DATE:	January 20, 1994	STATION:	Trip Blank
DATE SAMPLED:	January 11, 1994	TIME SAMPLED:	16:11
DATE RECEIVED:	January 12, 1994	SAMPLER:	Brad Wheeler
ANALYSIS DATE:	January 18, 1993	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Concentration (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	BPQL
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	BPQL
MTBE	1	BPQL

Surrogate % Recovery: 98%

BPQL = Below Practical Quantitation Limit (PQL).

MicroAssays of Vermont, Inc. P.O. Box 189 Middlesex, Vermont 05602 (802) 223-1468 FAX 223-8688

CLIENT NAME:	The Johnson Company, Inc.	PROJECT CODE:	1-1650-6
PROJECT NAME:	Pomerleau - Grossman's	REF.#:	8,113
REPORT DATE:	January 20, 1994	STATION:	MW-1 & MW-2
DATE SAMPLED:	January 12, 1994	TIME SAMPLED:	13:25 & 14:10
DATE RECEIVED:	January 12, 1994	SAMPLER:	Brad Wheeler
ANALYSIS DATE:	January 18, 1994	SAMPLE TYPE:	Water

Note: The presence of significant concentrations of a non-8020 analyte compound was observed. Samples MW-1 and MW-2 were both also found to contain approximately 1000 µg/L Dichlorodifluoromethane (Freon-12).

LABORATORY ANALYSIS

CLIENT NAME:	The Johnson Company, Inc.	MAV CONTROL #:	8113
ADDRESS:	5 State Street	DATE OF SAMPLE:	1/12/93
	Montpelier, VT 05602	DATE OF REPORT:	2/2/94
SAMPLE LOCATION:	Grossman's (Pomerleau)	SAMPLER:	Brad Wheeler
PROJECT NUMBER:	1-1650-6		

EXAMINATION REQUESTED:

Test - Total Petroleum Hydrocarbons. EPA 418.1

SPECIMENS:

(4) Liter glass jars containing water samples Labled MW-1, and MW-2.

FINDINGS:

	MW-1	MW-2	Units	PQL
TPH	BPQL	BPQL	mg / L	1

Reviewed by:

Kenneth Somerville
Head Chemist,Chemical Services

APPENDIX C

Groundwater Sample Laboratory Data Sheets - Scitest Laboratory

LABORATORY REPORT

CLIENT: Johnson Company
ADDRESS: 5 State Street
Montpelier, VT 05602

SITE: Grossman's: South Burlington
ATTN: Brad Wheeler

LABORATORY NO: 4-0189
PROJECT NO: 70252
DATE OF SAMPLE: 2/4/94
DATE OF RECEIPT: 2/8/94
DATE OF REPORT: 2/9/94

Groundwater results in micrograms per liter (ppb)

Parameter	MW-1	MW-2	Field Blank	QC/QA MS	DATA MSD	Practical Quantitation Limit
Chloromethane	BPQL	BPQL	BPQL			10
Bromomethane	BPQL	BPQL	BPQL			10
Vinyl Chloride	BPQL	BPQL	BPQL			10
Chloroethane	BPQL	BPQL	BPQL			10
Methylene Chloride	BPQL	BPQL	BPQL			10
Acetone	BPQL	BPQL	BPQL			20
Trichlorofluoromethane	BPQL	BPQL	BPQL			10
Carbon Disulfide	BPQL	BPQL	BPQL			10
1,1-Dichloroethene	BPQL	BPQL	BPQL	100%	101%	5
1,1-Dichloroethane	BPQL	BPQL	BPQL			5
1,2-Dichloroethene (Total)	BPQL	BPQL	BPQL			5
Chloroform	BPQL	BPQL	BPQL			5
1,2-Dichloroethane	BPQL	BPQL	BPQL			5
2-Butanone (MEK)	BPQL	BPQL	BPQL			20
1,1,1-Trichloroethane	BPQL	BPQL	BPQL			5
Carbon Tetrachloride	BPQL	BPQL	BPQL			5
Bromodichloromethane	BPQL	BPQL	BPQL			5
1,2-Dichloropropane	BPQL	BPQL	BPQL			5
c-1,3-Dichloropropene	BPQL	BPQL	BPQL			5
Trichloroethene	BPQL	BPQL	BPQL	109%	109%	5
Dibromochloromethane	BPQL	BPQL	BPQL			5
1,1,2-Trichloroethane	BPQL	BPQL	BPQL			5
Benzene	BPQL	BPQL	BPQL	96.6%	94.7%	5
t-1,3-Dichloropropene	BPQL	BPQL	BPQL			5
Bromoform	BPQL	BPQL	BPQL			5
4-Methyl-2-Pentanone(MIBK)	BPQL	BPQL	BPQL			20
2-Hexanone	BPQL	BPQL	BPQL			20
Tetrachloroethene	BPQL	BPQL	BPQL			5
1,1,2,2-Tetrachloroethane	BPQL	BPQL	BPQL			5
Toluene	BPQL	BPQL	BPQL	95.0%	90.2%	5
Chlorobenzene	BPQL	BPQL	BPQL	97.7%	96.6%	5
Ethylbenzene	BPQL	BPQL	BPQL			5
Styrene	BPQL	BPQL	BPQL			10
m-Xylene	BPQL	BPQL	BPQL			10
o,p-Xylene	BPQL	BPQL	BPQL			10
1,3-Dichlorobenzene	BPQL	BPQL	BPQL			10
1,2-Dichlorobenzene	BPQL	BPQL	BPQL			10
1,4-Dichlorobenzene	BPQL	BPQL	BPQL			10
Dichlorodifluoromethane	1250	1840	BPQL			10

EPA Method 8240, SW 846, 3rd Ed., Nov. 1986
BPQL=Below Practical Quantitation Limits
Matrix spike values in % recovery.

Note: A library search of an unknown peak in MW-1 at 8.4 min. yielded a 50% probability match with Cyclopropane.

Respectfully submitted,
SCITEST, INC.

Roderick J. Lamothe
Laboratory Director

SCITEST
LABORATORY SERVICES