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# Summary Report

*for the project entitled:*

**Oil Tank Removal - Site Management  
for the Washington Apartments**

*commissioned by:*

The Barre Housing Authority  
455 North Main Street  
Barre, Vermont 05641  
(802) 476-3185

22 December, 1993

KDAI Project No. 9375-002

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**K-D Associates, Inc.** Environmental Consulting & Laboratory Services  
1350 Shelburne Road, Suite 209, South Burlington, Vermont 05403 (802) 862-7490

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## Background

The Washington Street Apartments, located at 14 Washington Street in Barre, Vermont, is a 60 unit public housing building owned and operated by the Barre Housing Authority. Located in the center of the city, the structure is a four story brick building approximately 100 years old which was originally constructed as the City Hotel. A livery stable and carriage shop operated by the Cutler Brothers was located in the rear. In January of 1914, the hotel building was nearly destroyed by fire. Shortly thereafter, it was rebuilt as the Barre Hotel and shared the property with an auto garage, hotel auto storage building and livery stable. As automobiles replaced horse-drawn vehicles, the livery building, as well as the buildings on adjacent properties were converted to use as automobile sales, service and storage (see Sanborn maps located in the Appendix). Around 1925, as many as seven underground gasoline storage tanks (identified as G.T. on maps) can be identified within 150 feet of the subject property, including one tank in the approximate area of the tank removed for this project. Records of underground storage tanks and their removals were not filed with the State until 1985, and no other information or documentation could be located, thus the fate of all of these tanks is unknown.

Today, the hotel building is attached to the former garage building and used strictly as apartment units. The storage and livery buildings, which still appear on 1963 aerial photographs, have since been demolished. On 7 August, 1992, the Barre Housing Authority conducted a tank tightness test of the 26 year old 8,000 gallon No. 2 oil tank located on the east side of the building. The results by the Horner EZY-Check method indicated a leak rate of 0.4748 gallons/hour. The tank and its piping were kept in service until 2 July, 1993 when the tank was pumped to within six inches of product.

In July of 1993, Con-Test, Inc. conducted a preliminary subsurface investigation involving eight soil borings (identified as B1-B8) to a depth of 20 feet below grade, screening soil samples for volatile compounds at five foot intervals. The results of this work confirmed the presence of contamination and concluded by recommending additional work to determine the extent of contamination and its potential impact on adjacent receptors.

On 27 September, 1993, K-D Associates, Inc. was awarded a contract to perform the following investigation and assessment work specifically identified by Barre Housing Authority:

1. Perform a preliminary site assessment including contact with state and local officials, a determination of potential receptors and to conduct a thorough site inspection.

2. Prepare a sampling and safety and health plan to be used during site activities.
3. Drill ten soil borings, screening each for volatile organic compounds at two foot intervals.
4. Convert four of the borings to monitoring wells.
5. Analyze thirty soil samples from the drilling sites for total petroleum hydrocarbons.
6. Collect and analyze groundwater samples from each of the monitoring wells for total petroleum hydrocarbons and volatile organic compounds.
7. Determine the approximate groundwater elevation and flow direction.
8. Collect and analyze water samples from the nearby Potash Brook at the upstream entrance to the tunnel, at the midstream surface drain grating and at the outfall into the Stevens Branch River.
9. Collect and analyze soil samples for waste characterization for anticipated disposal by asphalt batching.
10. Provide a written report of the findings.
11. Collect and analyze eight air samples within the adjacent buildings for the presence of ambient levels of volatile organic compounds in accordance with the Vermont Department of Health protocols.
12. Provide specifications for the removal of the existing underground storage tank.
13. Oversee the tank pull activities.
14. Collect soil samples from the tank bed area after removal of the tank carcass and analyze each by field screening and laboratory analysis for total petroleum hydrocarbons.
15. Complete and submit the required documentation for underground storage tank closure.
16. Provide a summary report of the activities, findings and conclusions.

## Summary of Work

On 15 and 18 October, 1993, K-D Associates, Inc. and its drilling and boring subcontractor, Cushing & Sons, drilled 10 borings (identified as B9-B18) in the area of the tank using a hollow stem auger and collecting undisturbed soil samples at two foot intervals with a split spoon sampler. Samples were screened for volatile compounds using headspace analysis techniques and a photoionization detector (PID). Twenty eight soil samples from significant soil types or sample depths were also laboratory analyzed for total petroleum hydrocarbons (EPA Method 418.1). The placement of the borings attempted to define the outer limits of contamination, however significant levels were detected in each of the borings at varying depths, which was not the case with the initial data. Four of these ten borings were authorized as an addition to the contract by change order authorized by Keith Gauthier of the Barre Housing Authority. Laboratory analysis confirms significant levels of contamination that was detected in the field. (Laboratory documentation is located in the Appendix.) The varied soil types encountered during drilling suggests that the spread of contamination has been irregular, possibly due to the historical development of the site and the past use of inconsistent backfill materials. The potential size of the affected area was determined to be too large to effectively or economically remove the contaminated soil for asphalt batching as was originally planned. The removal of this amount of soil would have jeopardized the structural integrity of both the apartment building and the adjacent church and is generally considered a viable option only when all of the contamination can be isolated and removed without impacting the groundwater. Therefore, the collection and analysis of soil samples for waste characterization was deducted from the contract work.

On 18 and 27 October, K-D Associates, Inc. also collected eight indoor air samples within the apartment building and adjacent church for the presence of indoor levels of volatile organic compounds (identified as 291-01 thru -05 and 300-06 thru -09). The sampling method and analytical work specified in the Vermont Department of Health protocol for residential air quality monitoring was carefully followed, including a blank and outdoor background sample. This method is specific for detecting and determining the maximum indoor concentration of benzene. All samples indicated no detectable levels of benzene or any other of 28 organic compounds included in the analysis. (Laboratory documentation is located in the Appendix.)

Also on 27 October, 1993, the water samples from the Potash Brook locations were collected. Laboratory analysis for petroleum hydrocarbons and organic volatiles indicated concentration below detectable levels for EPA Methods 418.1 and 8010/8020. (Laboratory documentation is located in the Appendix.)

K-D Associates, Inc. was on site on 27 October, 1993 to monitor the excavation for an 8,000 gallon replacement oil tank. During excavation, soil samples were screened with a PID to segregate contaminated soils over 10 parts per million (ppm). While excavating near the building, the product lines for the existing tank were uncovered and were noted to be severely decayed. Stained soil, a noticeable petroleum odor and a peak PID reading of 111 ppm were recorded. Approximately 8 cubic yards of contaminated soil was temporarily stored on site on plastic sheeting.

The existing tank was removed on 01 November, 1993. K-D Associates, Inc. also screened and segregated soil samples during this phase of the project. The tank had been installed with clear sand backfill and was bolted to a concrete pad. Pollution Solutions of Vermont pumped the remaining six inches of sludge and residue prior to entering the tank for cleaning. The excavation area was limited to the ends and the east side of the tank due to its close proximity to the building foundation. PID readings between 0 ppm and 8 ppm were noted at depths from grade to eight feet below grade. When the tank carcass was removed, the soil from in the tank bed was observed to be primarily rust-stained, while PID readings between 6 ppm and 8 ppm were recorded. Core samples below the tank bed were limited to an additional six inches due to the concrete pad. Three core samples from below the tank bed (identified as 305-01 thru -03) were also lab analyzed for total petroleum hydrocarbons in which concentrations of 110 ppm, 98 ppm and 110 ppm were reported. Groundwater was not encountered, nor was free product or saturated soil. (Laboratory documentation is located in the Appendix.)

Further inspection of the tank carcass revealed minor surface oxidation and small pitted areas of the exterior, however no apparent holes or leaking seams were observed. The remainder of the product lines were also removed and were found to be in poor condition. All stockpiled contaminated soil was then backfilled in the former tank site and the area was brought to grade with clean fill.

On 12 November, 1993, the last four soil borings, which were converted to groundwater monitoring wells, were installed. Working within the limited property size, three wells (identified as MW-1, MW-2 and MW-4) were placed at the perimeter of the lot which also encircled the former tank site. The remaining well (MW-3) was placed in the area of the former product lines as a "worst case" indicator. Each well consists of 2" schedule 40 PVC piping with a minimum of ten feet of 0.01 slotted screen with at least five feet above and five feet below the measured groundwater level. Each was fully packed with filter sand and topped with a bentonite seal. Each well is capped with an expandable, locking plug and is covered by load-rated, flush-mount road boxes.

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place

Common  
lab  
contaminant

The static groundwater elevation in each well was measured and was used to determine the northeast to southwest general groundwater flow direction. A water sample from each well was collected for analysis for total petroleum hydrocarbons and volatile organic compounds. Results from MW-1 and MW-2 indicate the presence of 8  $\mu\text{g/L}$  and 1  $\mu\text{g/L}$  of chloromethane (methyl chloride) respectively as the only contaminant. The U.S. EPA has no Maximum Contaminant Level (MCL) for chloromethane, but lists it with other compounds having a lifetime health advisory in drinking water. The characteristic petroleum fuel constituents of benzene, toluene, ethylbenzene and xylenes were present in excess of the Vermont Primary Groundwater Drinking Standards in well MW-4, however no free product or sheen was observed on the water sample. A sample from MW-3 was not sent for lab analysis as 2.25 inches of product was found on the water surface.

## Conclusions

The results of the soil borings confirms the presence of soil and groundwater contamination, but also introduces unexpected and unexplained data. Normally, the release of No. 2 oil to the ground can be expected to move in a generally downward direction until it reaches the capillary fringe of groundwater. Several complicating factors of this site such as varied soil types (historic uses and backfill), physical obstacles (building foundations) and a surface water barrier (pavement) likely has influenced the "normal" dispersion of contamination. The foundation of the apartment building, which is approximately two feet above the groundwater, likely influences the hydraulic gradient of the groundwater flow by restricting the flow under the building and forces it to the south toward MW-4. The varied types, density and porosity of the underlying soil can also influence the ease and direction of contamination flow.

Therefore, if the product lines are assumed to be the source of the contamination based on observations of the site, the tank and its associated piping, the results showing contamination at shallow depths of the soil borings near the product lines would be consistent with normal "unrestricted" movement of contamination. Likewise, contamination at lower depths at any of the drilling sites would represent the downward movement of contamination similar in shape to an inverted cone. However, there are anomalies such as significant contamination detected as far as 28 feet away from the product lines (B13, B14, B15) at what would be just four feet below the depth of the assumed source (product lines). This type of lateral movement is highly unlikely and could potentially be the result of surface contamination seeping through cracks in the pavement or from a source unrelated to the underground storage tank.

In any event, the extent to which the soil sampling has been performed has eliminated soil removal for asphalt batching as a remediation option by documenting a larger area and depth of contamination. This would make soil removal economically impractical and also is not recommended when groundwater has been impacted.

The favorable results of the indoor air samples (identified as 291-01 thru 291-05 and 300-06 thru 300-09) confirms that vapors associated with the leaking tank system are not detectable within the apartment building or church. Likewise, the nearby Potash Brook does not appear to have been affected by the release.

Results of the water samples from the monitoring wells indicates that free product is present on the groundwater surface in the area of the former tank, and its movement has

extended to the south in the direction of MW-4, which already has detected constituents of No. 2 oil.

From this information, it is apparent that further action will be necessary to deal with the free floating product and restore the quality of the groundwater to within levels acceptable to the Vermont Agency of Natural Resources. A number of techniques are available to either contain a contaminant and/or treat the soil and groundwater. These can be divided into two categories: treatment in place (in situ) or physical removal for treatment (non-in situ). In situ treatment methods include volatilization, biodegradation, isolation and passive technologies. Non-in situ methods include thermal treatment, asphalt batching and excavation and treatment. Each method has preferred applications depending on many factors such as effectiveness to a particular contaminant(s), overall cost, and site specific criteria.

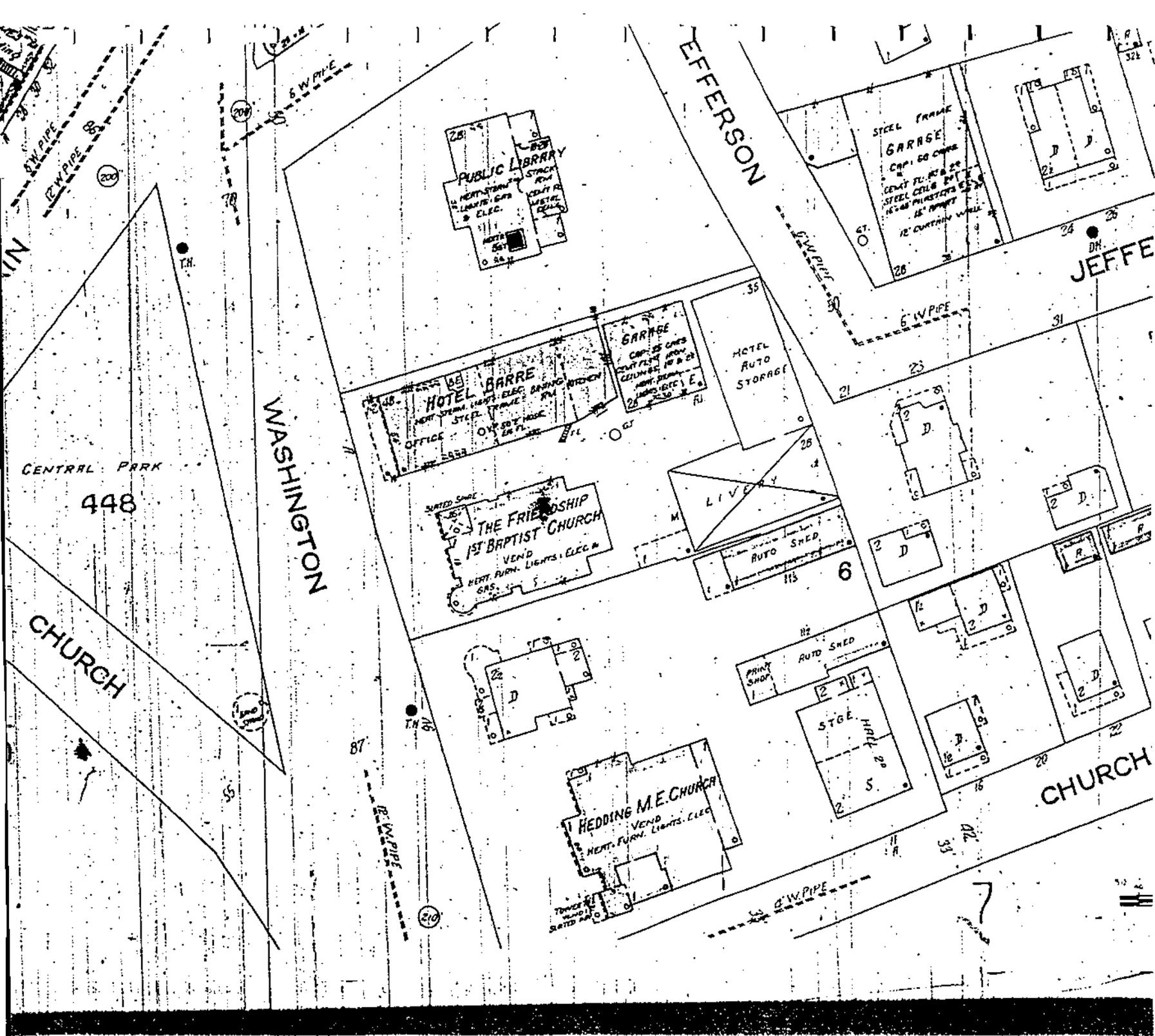
No. 2 oil is a mixture of many hydrocarbons, each with different physical and chemical characteristics that control the behavior of the product in soil or water. The more volatile components will tend to diffuse into both groundwater and air (soil vapor and/or surface environment) while other components will be more likely to rest on or be transported by the groundwater surface.

In the case of the Washington Street Apartments site, information gathered thus far would suggest that an in situ treatment method, which takes advantage of the site hydrogeology and known physical and chemical properties of No. 2 oil, might be the most effective remedial option when weighed against the relative costs for the various treatment technologies.

K-D Associates, Inc. is can provide an estimate for the design, installation and maintenance of a treatment system which would effectively remediate the impacted soil and groundwater. K-D Associates, Inc. is also confident that we can provide you with such a system in a cost-conscious manner. We look forward to discussing and negotiating the role K-D Associates, Inc. can serve in the next phase of this site.

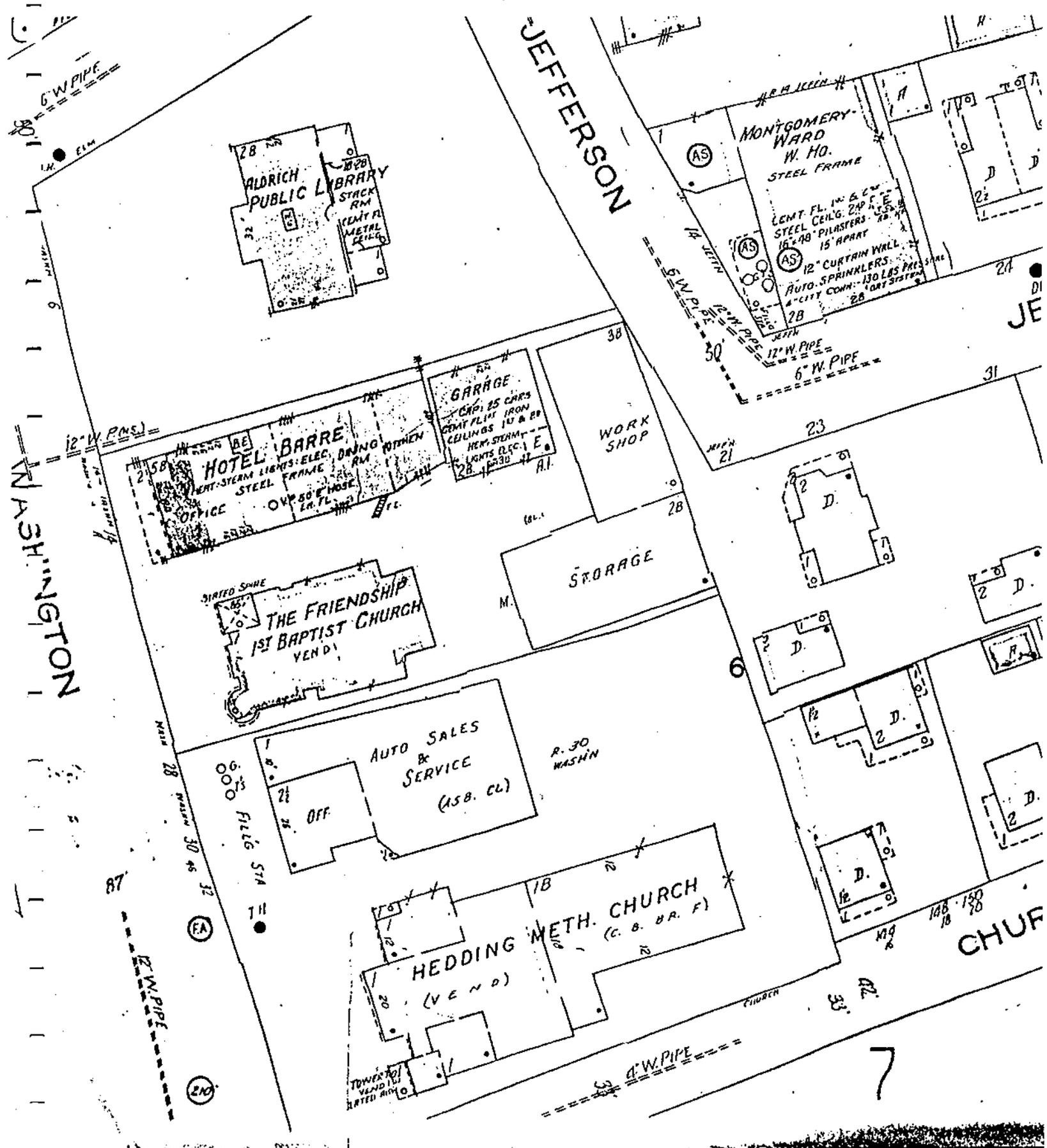
## Appendix





1920 Sanborn Fire Insurance Map of Barre, VT showing Hotel Barre and associated buildings which share the property. ("G.T." denotes a gasoline tank)

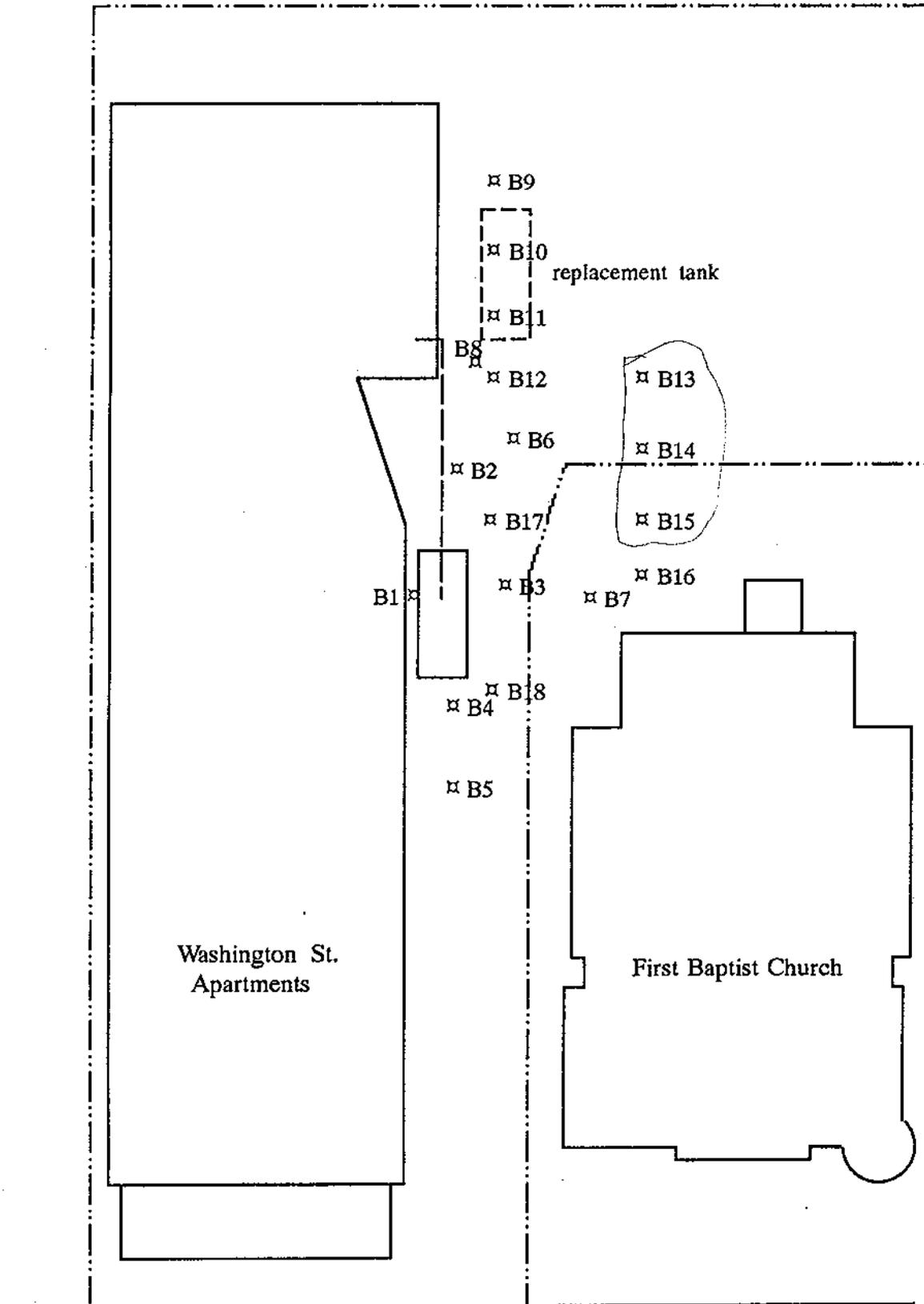
1925 Sanborn Fire Insurance Map of Barre, VT showing Hotel Barre and associated buildings which share the property. ("G.T." denotes a gasoline tank)



1963 aerial photograph of Barre, VT showing the subject property and existing outbuildings (highlighted).



# Soil Boring Locations - Washington Street Apartments



SCALE  
1" = 30'

WASHINGTON STREET

### Subsurface Investigation - 14 Washington Street, Barre, VT

Boring No.	<u>Contaminant Levels Detected in Parts Per Million (ppm)</u>						<u>Depth to groundwater from grade</u>
	<u>0-5'</u>	<u>6'-8'</u>	<u>8'-10'</u>	<u>10'-12'</u>	<u>12'-14'</u>	<u>15'-20'</u>	
B1	2	2	2	99	99	8	17'
B2	2	2	2	304	304	195	17'
B3	6	2	2	44	44	15	17'
B4	2	2	2	73	73	516	17'
B5	4	2	2	2	2	11	17'
B6	2	2	2	251	251	44	15'
B7	4	4	4	574	574	578	15'
B8	6	8	8	159	159	51	10'
B 9	2.3	2.3	13.1	21.0	8.8	--	13'
B10	0	0	0	0	0	--	12'
B11	0	0	37.0	31.1	--	--	12'
B12	0	16.7	50.1	50.0	--	--	11'
B13	24.5	88.8	88.8	14.1	50.1	--	12'3"
B14	9.7	8.9	16.9	103	--	--	----
B15	63.3	110	35.2	31.1	30.0	--	14'
B16	2.1	52.5	31.1	23.5	41.6	--	14'
B17	--	8.8	--	162	51.1	136	16'
B18	--	17.5	28.3	44.1	31.6	140	16'6"

Depth to groundwater was estimated using the point where saturated soil was encountered during drilling.  
 Soil borings #1 - 8 were screened using a Thermo Environmental Instruments OVM (10.0 eV detector).  
 Soil borings #9 - 18 were conducted by K-D Associates, Inc. using a Photovac PID (10.6 eV detector).

# Monitoring Well Locations - Washington Street Apartments

MW-2

(+12.75")

MW-1

(+20.375")

*TOC data*  
*D to GW data*

replacement tank

Groundwater  
Flow

MW-3

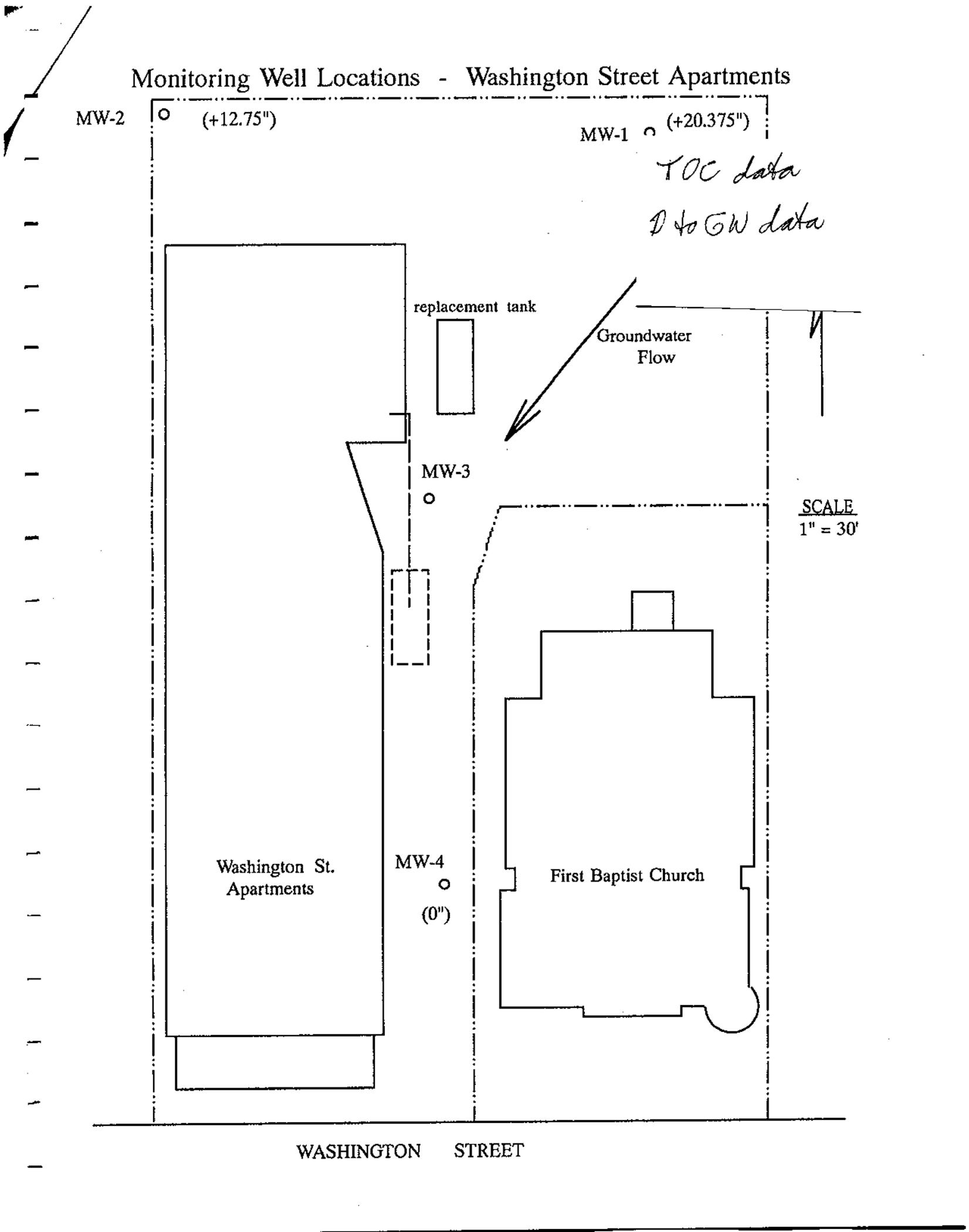
SCALE  
1" = 30'

Washington St.  
Apartments

MW-4  
(0")

First Baptist Church

WASHINGTON STREET



VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
 UNDERGROUND STORAGE TANK PROGRAM  
 103 SOUTH MAIN STREET  
 WATERBURY, VERMONT 05671-0404  
 (802) 244-8702

\*\*\*\*\*  
 Date of Removal: 01 Nov 93                      Date of Assessment: 02 Nov 93  
 Person & Company Doing Assessment: Bryan Schultz, K-D Associates, Inc.  
 Telephone Number: (802) 862-7490

Business Name Where Tank(s) Located: Washington St. Apartments  
 Number of Employees: 20 employees, 60 residents  
 Street Address & Town/City: 14 Washington St, Barre, VT

Owner of Tank(s): Barre Housing Authority  
 Address: 455 N. Main St.                      Contact Person: Keith Gauthier  
 Town/City: Barre, VT      05641                      Phone Number: 476-3185

UST Facility ID Number:

Tank #	Product	Size	Condition
1	No. 2 oil	8000 gallons	fair-surface rust,
2			minor pitting
3			
4			

Reason for Tank Removal (check one):  abandoned                       routine replacement  
 tank or piping leaking                       liability  
 Replacement Tank(s)?  yes     no    Number of Replacement Tanks: 1  
 DEC UST Permit(s) Obtained?     yes     no                      same  
 DEC-Permitted Tank(s) Still On-Site?     yes     no    Number of Tanks: \_\_\_\_\_  
 Out of Service Tank(s) On-Site?     yes     no    Number of Tanks: \_\_\_\_\_  
 Heating Oil Tank(s) On-Site?     yes     no    No. of Tanks: 1    Size(s): 8000

Any Waste Pumpage?  yes     no    Estimated Volume: <200 gal  
 Transported By: Pollution Solutions of VT

Size of Excavation (ft<sup>2</sup>): 400    Depth: 11    Soil Type: coarse sand  
 Concentrations Detected with PID:    Peak = 111    Average = 30  
 Type of PID: Photovac  
 Number of Readings (please put locations on attached drawing): 5  
 Calibration Info. (date, time, type of gas): 11/1/93, 1000, isobutylene 100 ppm

Free Phase Product Encountered?     yes     no    Approx. Amount: \_\_\_\_\_  
 Cont. Soils Stockpiled?     yes     no    Amount (yd<sup>3</sup>): \_\_\_\_\_  
 Cont. Soils Backfilled?     yes     no    Amount (yd<sup>3</sup>): 10

Groundwater Encountered?     yes     no    Depth to Groundwater: 14"  
 Monitoring Wells Installed?     yes     no    Number: 74    Screen Depth: scheduled for 11/10/93

On-Site Drinking Well?     yes     no    (if yes:  rock     gravel     spring)  
 Public Water Supply Well(s) Within 1/4 Mile?     yes     no  
 Distance to nearest: \_\_\_\_\_  
 Private Water Supply Well(s) Within 1/4 Mile?     yes     no    How Many? \_\_\_\_\_

Samples Collected for Laboratory Analysis?     yes     no    How Many? 3  
 (check all that apply:  soil     groundwater     drinking water)

Receptors Affected (check all that apply):  
 soil                       residential; # of houses/people: \_\_\_\_\_  
 groundwater     surface water; name/type of water body: \_\_\_\_\_  
 to be determined

Signature of Owner or Authorized Representative: Bryan Schultz  
 Date: 02 Nov 93  
 Signature of Person Performing Site Assessment: Bryan Schultz  
 Date: 02 NOV 93

\*\*\* ATTACH OBSERVATIONS, CONCLUSIONS, AND DRAWING ON A SEPARATE PAGE \*\*\*

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
UNDERGROUND STORAGE TANK PROGRAM  
TANK PULL FORM

TODAY'S DATE: 02 Nov 93

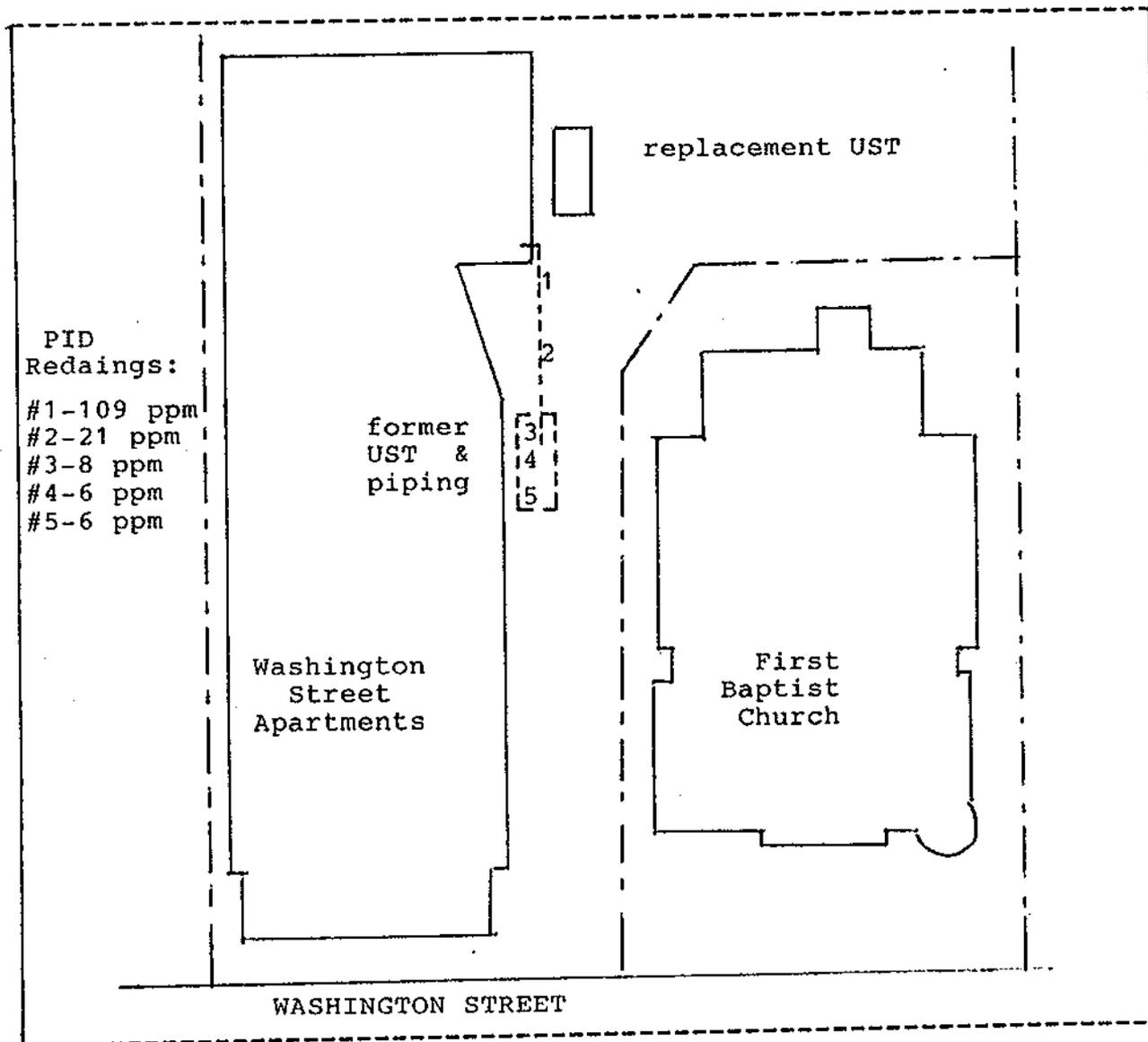
INSPECTOR: Bryan Schultz, KDAI

DATE OF REMOVAL: 01 Nov 93

BUSINESS NAME: Washington St. Apts.  
Barre, VT

SITE DIAGRAM

Show location of all tanks and distance to permanent structures, sample points, areas of contamination and any pertinent site information. Indicate North arrow and major street names or route number.



# KDAI

ENVIRONMENTAL ENGINEERING  
& LABORATORY SERVICES

02 November, 1993

Mr. Richard Spiese  
Hazardous Materials Management Division  
Dept. of Environmental Conservation  
103 South Main Street / West Bldg.  
Waterbury, Vermont 05671-0404

RE: Site Assessment for UST Closure  
Washington Street Apartments, Barre, VT

Dear Mr. Spiese:

On behalf of Barre Housing Authority, K-D Associates, Inc. submits the following information relative to the removal of an underground storage tank at the above mentioned site.

Prompted by an earlier tank tightness test which indicated a leak, preliminary investigative work for this site has included soil borings with field screening and lab analysis of ten of eighteen borings to date. Results of this preliminary work has indicated contamination ranging from 0 ppm to 578 ppm using a PID and OVM at depths of 0 to 17 feet. A summary of PID and OVM readings and respective locations is enclosed. Results of laboratory analysis will be forwarded when available.

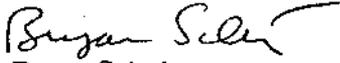
On 27 October, 1993, excavation for an 8,000 gallon replacement tank encountered contaminated soil primarily the area of the existing tank's product lines with a peak reading of 111 ppm. All soils disturbed during this project were screened by the bucket load and contaminated soil above 10 ppm was segregated and temporarily stored on, and covered with plastic. A total of approximately 8 cubic yards of soil was separated.

As scheduled, the existing 8,000 gallon UST was removed on 01 November, 1993. Installed in 1969, this tank had been used as storage for No. 2 oil for on site heating purposes. Approximately six inches of remaining product and sludge was pumped from the tank and the interior was cleaned by Pollution Solutions of Vermont. The soil type encountered during excavation was clear sand, which was also screened for contamination during removal. PID readings of soils from grade to 8 feet were between 0 ppm and 8 ppm. When the tank carcass was removed, the soil forming the tank bed was observed to be primarily rust-stained, while PID readings between 6 ppm and 8 ppm were recorded. Further excavation below the tank bed was limited to an additional six inches due to a concrete pad. Groundwater was not encountered, nor was free product or saturated soils.

Excavation of the product lines followed, which were observed to be heavily oxidized and brittle. Contaminated soil measuring a peak of 109 ppm was recorded in this area. This soil and the contaminated soil previously segregated was then backfilled and brought to grade with clean fill.

Further investigations including the installation of four monitoring wells, groundwater sampling and analysis is scheduled. Additional information on the potential impact on the surrounding area and the building residents is being gathered and will be forwarded to you when it is available. Should you have any questions or other concerns, please contact our office.

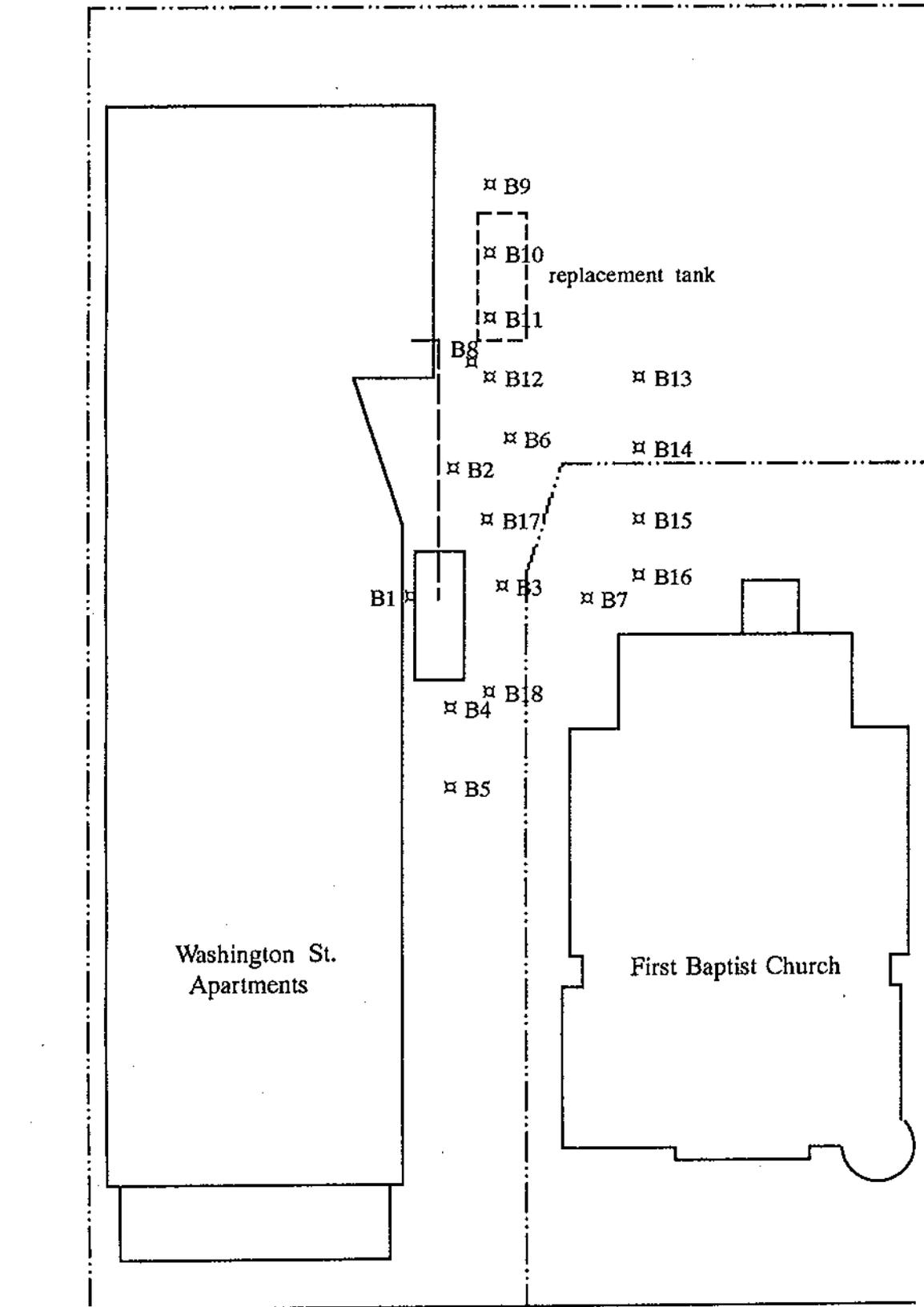
Sincerely,

  
Bryan Schultz

cc: Keith Gauthier, Barre Housing Authority  
file 9375-002

Enclosures

# Soil Boring Locations - Washington Street Apartments



WASHINGTON STREET

**Subsurface Investigation - 14 Washington Street, Barre, VT**

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B10	0	0	0	0	0	--	12'
B11	0	0	37.0	31.1	--	--	12'
B12	0	16.7	50.1	50.0	--	--	11'
B13	24.5	88.8	88.8	14.1	50.1	--	12'3"
B14	9.7	8.9	16.9	103	--	--	----
B15	63.3	110	35.2	31.1	30.0	--	14'
B16	2.1	52.5	31.1	23.5	41.6	--	14'
B17	--	8.8	--	162	51.1	136	16'
B18	--	17.5	28.3	44.1	31.6	140	16'6"

Depth to groundwater was estimated using the point where saturated soil was encountered during drilling.

Soil borings #1 - 8 were screened using a Thermo Environmental Instruments OVM (10.0 eV detector).

Soil borings #9 - 18 were conducted by K-D Associates, Inc. using a Photovac PID (10.6 eV detector).



**MicroAssays of Vermont, Inc.**  
*Specializing in Microbiological Analysis*

P.O. Box 189  
Montpelier, VT 05602  
(802) 223-1468 • Fax: 223-8688

**CHEMICAL ANALYSIS REPORT**  
MAV Control No. 7797

December 3, 1993

TO: K-D Associates, Inc.  
P.O. Box 4326  
Burlington, Vermont 05406

**EXAMINATION REQUESTED:**

Test - Total Petroleum Hydrocarbons in water.

**SPECIMENS:**

7797 Three(3) Bottles containing water samples.

**FINDINGS:**

Specimen # MW-1 was found to contain less than 5 milligrams Petroleum Hydrocarbons per liter.  
Specimen # MW-2 was found to contain less than 5 milligrams Petroleum Hydrocarbons per liter.  
Specimen # MW-4 was found to contain less than 5 milligrams Petroleum Hydrocarbons per liter.

Respectfully,

Kenneth Somerville  
Head Chemist, Chemical Services



## LABORATORY REPORT

### EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	K-D Associates	PROJECT CODE:	9375-002
PROJECT NAME:	not given	REF.#:	7,797
REPORT DATE:	November 30, 1993	STATION:	MW-1
DATE SAMPLED:	November 18, 1993	TIME SAMPLED:	not given
DATE RECEIVED:	November 18, 1993	SAMPLER:	Bryan Schultz
ANALYSIS DATE:	November 24, 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:	K-D Associates	PROJECT CODE:	9375-002
PROJECT NAME:	not given	REF.#:	7,797
REPORT DATE:	November 30, 1993	STATION:	MW-2
DATE SAMPLED:	November 18, 1993	TIME SAMPLED:	not given
DATE RECEIVED:	November 18, 1993	SAMPLER:	Bryan Schultz
ANALYSIS DATE:	November 24, 1993	SAMPLE TYPE:	Water

PARAMETER	PQL ( $\mu\text{g/L}$ )	Concentration ( $\mu\text{g/L}$ )
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: 100%

BPQL = Below Practical Quantitation Limit (PQL).



## LABORATORY REPORT

### EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	K-D Associates	PROJECT CODE:	9375-002
PROJECT NAME:	not given	REF.#:	7,797
REPORT DATE:	November 30, 1993	STATION:	MW-4
DATE SAMPLED:	November 18, 1993	TIME SAMPLED:	not given
DATE RECEIVED:	November 18, 1993	SAMPLER:	Bryan Schultz
ANALYSIS DATE:	November 27, 1993	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Concentration (µg/L)
Benzene	100	6,430
Toluene	100	6,780
Ethylbenzene	100	3,170
m+p-Xylene	200	8,140
o-Xylene	100	3,650
Chlorobenzene	100	BPQL
1,2-Dichlorobenzene	100	BPQL
1,3-Dichlorobenzene	100	BPQL
1,4-Dichlorobenzene	100	BPQL
MTBE	100	BPQL

Surrogate % Recovery: 100%

BPQL = Below Practical Quantitation Limit (PQL).



## LABORATORY REPORT

### EPA METHOD 8010 ANALYTES with GC/MS Confirmation

CLIENT NAME:	K-D Associates	PROJECT CODE:	9375-002
PROJECT NAME:	not given	REF.#:	7,797
REPORT DATE:	November 30, 1993	STATION:	MW-1
DATE SAMPLED:	November 18, 1993	TIME SAMPLED:	not given
DATE RECEIVED:	November 18, 1993	SAMPLER:	Bryan Schultz
ANALYSIS DATE:	November 24, 1993	SAMPLE TYPE:	Water

Concentration units =  $\mu\text{g/L}$

PARAMETER	MW-1	PQL	PARAMETER	MW-1	PQL
Benzyl Chloride	BPQL	1	1,1-Dichloroethane	BPQL	1
Bromobenzene	BPQL	1	1,2-Dichloroethane	BPQL	1
Bromodichloromethane	BPQL	1	1,1_Dichloroethene	BPQL	1
Bromoform	BPQL	1	trans-1,2-Dichloroethene	BPQL	1
Bromomethane	BPQL	1	Dichloromethane	BPQL	1
Carbon tetrachloride	BPQL	1	1,2-Dichloropropane	BPQL	1
Chlorobenzene	BPQL	1	1,3-Dichloropropane	BPQL	1
Chloroethane	BPQL	1	1,1,2,2-Tetrachloroethane	BPQL	1
Chloroform	BPQL	1	1,1,1,2-Tetrachloroethane	BPQL	1
Chloromethane	8	1	Tetrachloroethene	BPQL	1
2-Chloro vinyl ether	BPQL	1	1,1,1-Trichloroethane	BPQL	1
Dibromochloromethane	BPQL	1	1,1,2-Trichloroethane	BPQL	1
Dibromomethane	BPQL	1	Trichloroethene	BPQL	1
1,2-Dichlorobenzene	BPQL	1	Trichlorofluoromethane	BPQL	1
1,3-Dichlorobenzene	BPQL	1	1,2,3-Trichloropropane	BPQL	1
1,4-Dichlorobenzene	BPQL	1	Vinyl Chloride	BPQL	1
Dichlorodifluoromethane	BPQL	1			

Surrogate % Recovery: 91%

BPQL = Below Practical Quantitation Limit (PQL).



## LABORATORY REPORT

### EPA METHOD 8010 ANALYTES with GC/MS Confirmation

CLIENT NAME:	K-D Associates	PROJECT CODE:	9375-002
PROJECT NAME:	not given	REF.#:	7,797
REPORT DATE:	November 30, 1993	STATION:	MW-2
DATE SAMPLED:	November 18, 1993	TIME SAMPLED:	not given
DATE RECEIVED:	November 18, 1993	SAMPLER:	Bryan Schultz
ANALYSIS DATE:	November 24, 1993	SAMPLE TYPE:	Water

Concentration units =  $\mu\text{g/L}$

PARAMETER	MW-2	PQL	PARAMETER	MW-2	PQL
Benzyl Chloride	BPQL	1	1,1-Dichloroethane	BPQL	1
Bromobenzene	BPQL	1	1,2-Dichloroethane	BPQL	1
Bromodichloromethane	BPQL	1	1,1_Dichloroethene	BPQL	1
Bromoform	BPQL	1	trans-1,2-Dichloroethene	BPQL	1
Bromomethane	BPQL	1	Dichloromethane	BPQL	1
Carbon tetrachloride	BPQL	1	1,2-Dichloropropane	BPQL	1
Chlorobenzene	BPQL	1	1,3-Dichloropropane	BPQL	1
Chloroethane	BPQL	1	1,1,2,2-Tetrachloroethane	BPQL	1
Chloroform	BPQL	1	1,1,1,2-Tetrachloroethane	BPQL	1
Chloromethane	1	1	Tetrachloroethene	BPQL	1
2-Chloro vinyl ether	BPQL	1	1,1,1-Trichloroethane	BPQL	1
Dibromochloromethane	BPQL	1	1,1,2-Trichloroethane	BPQL	1
Dibromomethane	BPQL	1	Trichloroethene	BPQL	1
1,2-Dichlorobenzene	BPQL	1	Trichlorofluoromethane	BPQL	1
1,3-Dichlorobenzene	BPQL	1	1,2,3-Trichloropropane	BPQL	1
1,4-Dichlorobenzene	BPQL	1	Vinyl Chloride	BPQL	1
Dichlorodifluoromethane	BPQL	1			

Surrogate % Recovery: 100%

BPQL = Below Practical Quantitation Limit (PQL).



## LABORATORY REPORT

### EPA METHOD 8010 ANALYTES with GC/MS Confirmation

CLIENT NAME:	K-D Associates	PROJECT CODE:	9375-002
PROJECT NAME:	not given	REF.#:	7,797
REPORT DATE:	November 30, 1993	STATION:	MW-4
DATE SAMPLED:	November 18, 1993	TIME SAMPLED:	not given
DATE RECEIVED:	November 18, 1993	SAMPLER:	Bryan Schultz
ANALYSIS DATE:	November 24, 1993	SAMPLE TYPE:	Water

Concentration units =  $\mu\text{g/L}$

PARAMETER	MW-4	PQL	PARAMETER	MW-4	PQL
Benzyl Chloride	BPQL	1	1,1-Dichloroethane	BPQL	1
Bromobenzene	BPQL	1	1,2-Dichloroethane	7	1
Bromodichloromethane	2	1	1,1_Dichloroethene	BPQL	1
Bromoform	BPQL	1	trans-1,2-Dichloroethene	BPQL	1
Bromomethane	BPQL	1	Dichloromethane	BPQL	1
Carbon tetrachloride	BPQL	1	1,2-Dichloropropane	BPQL	1
Chlorobenzene	BPQL	1	1,3-Dichloropropane	BPQL	1
Chloroethane	BPQL	1	1,1,2,2-Tetrachloroethane	BPQL	1
Chloroform	17	1	1,1,1,2-Tetrachloroethane	BPQL	1
Chloromethane	2	1	Tetrachloroethene	BPQL	1
2-Chloro vinyl ether	BPQL	1	1,1,1-Trichloroethane	BPQL	1
Dibromochloromethane	BPQL	1	1,1,2-Trichloroethane	BPQL	1
Dibromomethane	BPQL	1	Trichloroethene	BPQL	1
1,2-Dichlorobenzene	BPQL	1	Trichlorofluoromethane	BPQL	1
1,3-Dichlorobenzene	BPQL	1	1,2,3-Trichloropropane	BPQL	1
1,4-Dichlorobenzene	3	1	Vinyl Chloride	BPQL	1
Dichlorodifluoromethane	BPQL	1			

Surrogate % Recovery: 99%

BPQL = Below Practical Quantitation Limit (PQL).



Attention: Jerry Knickerbacher  
K-D Associates  
P.O. Box 4326  
Burlington, VT 05406-4326

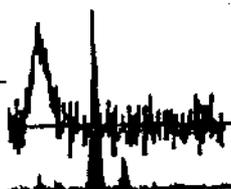
Project #: 9311065  
Date Received: 11/04/93 14:30

The following results are for Petroleum Hydrocarbons, Total (I.R)

Lab #	Conc.	Unit	Client Designation
93 0016658	110	mg/kg	305-01
93 0016659	98	mg/kg	305-02
93 0016660	110	mg/kg	305-03

The following results are for Solids, Total

Lab #	Conc.	Unit	Client Designation
93 0016658	84	%	305-01
93 0016659	82	%	305-02
93 0016660	84	%	305-03





METHODOLOGY

All analyses are adapted from one or more of the following reference methods:

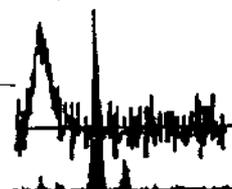
- . "Guidelines Establishing Test Procedures for the Analysis of Pollutants", Code of Federal Regulations Vol. 40, Part 136.
- . "Test Methods for Evaluating Solid Waste", SW846 Third Edition, September 1986, USEPA.
- . Code of Federal Regulations Vol. 40, Part 261, "Appendix II-Method 1311 Toxicity Characteristic Leaching Procedure (TCLP)".
- . "Standard Methods for the Examination of Water and Wastewater", 15th, 16th and 17th editions.
- . "Methods for the Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983, EMSL.
- . "Annual Book of Standards, Section 11-Water", American Society for Testing and Materials (ASTM).
- . "Methods for the Determination of Organic Compounds in Drinking Water", EPA 600/4-88/039, December 1988.

DEFINITIONS

- U: Not Detected
- B: Compound found in method blank
- E: Estimated Concentration
- J: Compound detected, however below report detection limit.
- NFL: No Free Liquid
- NR: Not Reactive
- NA: Not Applicable
- NS: Not Requested
- NI: Not Ignitable

COMMENTS

All soil samples are calculated on a dry weight basis except as noted.



Attention: Brian Schultz  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/15/93  
 Project Number: 9310623  
 Lab ID: 93-0016240  
 Date Collected: 10/27/93 00:00  
 Collected By: Client  
 Date Received: 10/29/93 13:00

Client Project: 9375-002

Client Designation: Entrance

	Conc.	Unit
	-----	-----
LIMITED		
Petroleum Hydrocarbons, Total (I.R)	<1	mg/l
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<5	ug/l
1,2-Dichlorobenzene	<5	ug/l
1,4-Dichlorobenzene	<5	ug/l
1,3-Dichlorobenzene	<5	ug/l
1,1-Dichloroethane	<5	ug/l
1,1,1-Trichloroethane	<5	ug/l
1,2-Dichloroethane	<5	ug/l
1,2-Dichloropropane	<5	ug/l
1,1,2-Trichloroethane	<5	ug/l
Benzene	<5	ug/l
Bromodichloromethane	<5	ug/l
Bromoform	<5	ug/l
Bromomethane	<10	ug/l
Carbon tetrachloride	<5	ug/l
cis-1,3-Dichloropropene	<5	ug/l
Chlorobenzene	<5	ug/l
Chlorodibromomethane	<5	ug/l
Chloroethane	<10	ug/l
2-Chloroethylvinyl ether	<50	ug/l
Chloromethane	<10	ug/l
Chloroform	<5	ug/l
1,1-Dichloroethene	<5	ug/l
Ethylbenzene	<5	ug/l
Methylene chloride	<5	ug/l
Tetrachloroethene	<5	ug/l
Trichloroethene	<5	ug/l
trans-1,2-Dichloroethene	<5	ug/l
trans-1,3-Dichloropropene	<5	ug/l
Toluene	<5	ug/l
Trichlorofluoromethane	<10	ug/l
Vinyl chloride	<10	ug/l
Xylenes (total)	<5	ug/l



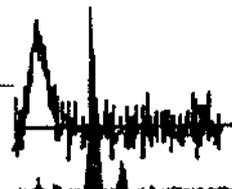
Attention: Brian Schultz  
K-D Associates  
P.O. Box 4326  
Burlington VT 05406-4326

Date of Report: 11/15/93  
Project Number: 9310623  
Lab ID: 93-0016241  
Date Collected: 10/27/93 00:00  
Collected By: Client  
Date Received: 10/29/93 13:00

Client Project: 9375-002

Client Designation: Mid Stream

	Conc.	Unit
	-----	-----
LIMITED		
Petroleum Hydrocarbons, Total (I.R)	<1	mg/l
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<5	ug/l
1,2-Dichlorobenzene	<5	ug/l
1,4-Dichlorobenzene	<5	ug/l
1,3-Dichlorobenzene	<5	ug/l
1,1-Dichloroethane	<5	ug/l
1,1,1-Trichloroethane	<5	ug/l
1,2-Dichloroethane	<5	ug/l
1,2-Dichloropropane	<5	ug/l
1,1,2-Trichloroethane	<5	ug/l
Benzene	<5	ug/l
Bromodichloromethane	<5	ug/l
Bromoform	<5	ug/l
Bromomethane	<10	ug/l
Carbon tetrachloride	<5	ug/l
cis-1,3-Dichloropropene	<5	ug/l
Chlorobenzene	<5	ug/l
Chlorodibromomethane	<5	ug/l
Chloroethane	<10	ug/l
2-Chloroethylvinyl ether	<50	ug/l
Chloromethane	<10	ug/l
Chloroform	<5	ug/l
1,1-Dichloroethene	<5	ug/l
Ethylbenzene	<5	ug/l
Methylene chloride	<5	ug/l
Tetrachloroethene	<5	ug/l
Trichloroethene	<5	ug/l
trans-1,2-Dichloroethene	<5	ug/l
trans-1,3-Dichloropropene	<5	ug/l
Toluene	<5	ug/l
Trichlorofluoromethane	<10	ug/l
Vinyl chloride	<10	ug/l
Xylenes (total)	<5	ug/l





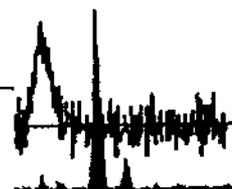
Attention: Brian Schultz  
K-D Associates  
P.O. Box 4326  
Burlington VT 05406-4326

Date of Report: 11/15/93  
Project Number: 9310623  
Lab ID: 93-0016242  
Date Collected: 10/27/93 00:00  
Collected By: Client  
Date Received: 10/29/93 13:00

Client Project: 9375-002

Client Designation: Out Fall

	Conc.	Unit
	-----	-----
LIMITED		
Petroleum Hydrocarbons, Total (I.R)	<1	mg/l
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<5	ug/l
1,2-Dichlorobenzene	<5	ug/l
1,4-Dichlorobenzene	<5	ug/l
1,3-Dichlorobenzene	<5	ug/l
1,1-Dichloroethane	<5	ug/l
1,1,1-Trichloroethane	<5	ug/l
1,2-Dichloroethane	<5	ug/l
1,2-Dichloropropane	<5	ug/l
1,1,2-Trichloroethane	<5	ug/l
Benzene	<5	ug/l
Bromodichloromethane	<5	ug/l
Bromoform	<5	ug/l
Bromomethane	<10	ug/l
Carbon tetrachloride	<5	ug/l
cis-1,3-Dichloropropene	<5	ug/l
Chlorobenzene	<5	ug/l
Chlorodibromomethane	<5	ug/l
Chloroethane	<10	ug/l
2-Chloroethylvinyl ether	<50	ug/l
Chloromethane	<10	ug/l
Chloroform	<5	ug/l
1,1-Dichloroethene	<5	ug/l
Ethylbenzene	<5	ug/l
Methylene chloride	<5	ug/l
Tetrachloroethene	<5	ug/l
Trichloroethene	<5	ug/l
trans-1,2-Dichloroethene	<5	ug/l
trans-1,3-Dichloropropene	<5	ug/l
Toluene	<5	ug/l
Trichlorofluoromethane	<10	ug/l
Vinyl chloride	<10	ug/l
Xylenes (total)	<5	ug/l





METHODOLOGY

All analyses are adapted from one or more of the following reference methods:

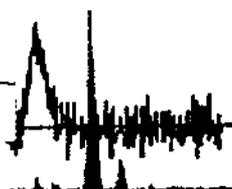
- . "Guidelines Establishing Test Procedures for the Analysis of Pollutants", Code of Federal Regulations Vol. 40, Part 136.
- . "Test Methods for Evaluating Solid Waste", SW846 Third Edition, September 1986, USEPA.
- . Code of Federal Regulations Vol. 40, Part 261, "Appendix II-Method 1311 Toxicity Characteristic Leaching Procedure (TCLP)".
- . "Standard Methods for the Examination of Water and Wastewater", 15th, 16th and 17th editions.
- . "Methods for the Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983, EMSL.
- . "Annual Book of Standards, Section 11-Water", American Society for Testing and Materials (ASTM).
- . "Methods for the Determination of Organic Compounds in Drinking Water", EPA 600/4-88/039, December 1988.

DEFINITIONS

- U: Not Detected
- B: Compound found in method blank
- E: Estimated Concentration
- J: Compound detected, however below report detection limit.
- NFL: No Free Liquid
- NR: Not Reactive
- NA: Not Applicable
- NS: Not Requested
- NI: Not Ignitable

COMMENTS

All soil samples are calculated on a dry weight basis except as noted.





*Need a description  
of test  
procedure,  
sampling  
results*

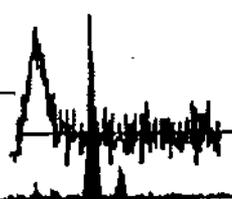
11/12/93  
9310622  
93-0016235  
Date Collected: 10/27/93 00:00  
Collected By: Client  
Date Received: 10/29/93 13:00

Attention: Brian Schultz  
K-D Associates  
P.O. Box 4326  
Burlington VT 05406-4326

Client Project: 9375-002

Client Designation: 300-06

	Conc.	Unit
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



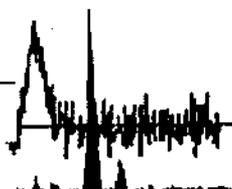
Attention: Brian Schultz  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/12/93  
 Project Number: 9310622  
 Lab ID: 93-0016236  
 Date Collected: 10/27/93 00:00  
 Collected By: Client  
 Date Received: 10/29/93 13:00

Client Project: 9375-002

Client Designation: 300-07

	Conc.	Unit
-----		
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



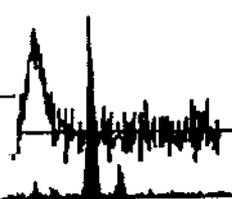
Attention: Brian Schultz  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/12/93  
 Project Number: 9310622  
 Lab ID: 93-0016237  
 Date Collected: 10/27/93 00:00  
 Collected By: Client  
 Date Received: 10/29/93 13:00

Client Project: 9375-002

Client Designation: 300-08

	Conc.	Unit
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



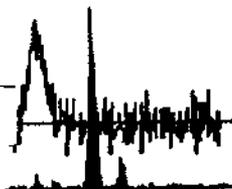
Attention: Brian Schultz  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/12/93  
 Project Number: 9310622  
 Lab ID: 93-0016238  
 Date Collected: 10/27/93 00:00  
 Collected By: Client  
 Date Received: 10/29/93 13:00

Client Project: 9375-002

Client Designation: 300-09

	Conc.	Unit
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



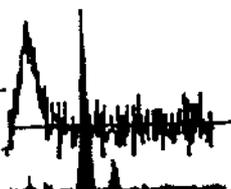
Attention: Brian Schultz  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/12/93  
 Project Number: 9310622  
 Lab ID: 93-0016239  
 Date Collected: 10/27/93 00:00  
 Collected By: Client  
 Date Received: 10/29/93 13:00

Client Project: 9375-002

Client Designation: Blank

	Conc.	Unit
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



METHODOLOGY

All analyses are adapted from one or more of the following reference methods:

- . "Guidelines Establishing Test Procedures for the Analysis of Pollutants", Code of Federal Regulations Vol. 40, Part 136.
- . "Test Methods for Evaluating Solid Waste", SW846 Third Edition, September 1986, USEPA.
- . Code of Federal Regulations Vol. 40, Part 261, "Appendix II-Method 1311 Toxicity Characteristic Leaching Procedure (TCLP)".
- . "Standard Methods for the Examination of Water and Wastewater", 15th, 16th and 17th editions.
- . "Methods for the Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983, EMSL.
- . "Annual Book of Standards, Section 11-Water", American Society for Testing and Materials (ASTM).
- . "Methods for the Determination of Organic Compounds in Drinking Water", EPA 600/4-88/039, December 1988.

DEFINITIONS

U: Not Detected  
B: Compound found in method blank  
E: Estimated Concentration  
J: Compound detected, however below report detection limit.  
NFL: No Free Liquid  
NR: Not Reactive  
NA: Not Applicable  
NS: Not Requested  
NI: Not Ignitable

COMMENTS

All soil samples are calculated on a dry weight basis except as noted.

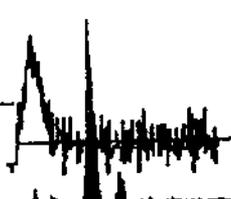
Attention: Brian Schultz  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/08/93  
 Project Number: 9310503  
 Lab ID: 93-0015391  
 Date Collected: 10/18/93 00:00  
 Collected By: Client  
 Date Received: 10/20/93 13:00

Client Project: 9375-002

Client Designation: 291-01/Church-Basmt

	Conc.	Unit
	-----	-----
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



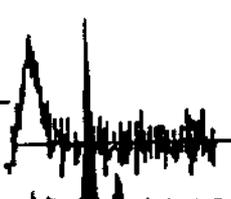
Attention: Jerry Knickerbacher  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/08/93  
 Project Number: 9310503  
 Lab ID: 93-0015392  
 Date Collected: 10/18/93 00:00  
 Collected By: Client  
 Date Received: 10/20/93 13:00

Client Project: 9375-002

Client Designation: 291-02/Church-Basmt

	Conc.	Unit
	-----	-----
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



Attention: Jerry Knickerbacher  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/08/93  
 Project Number: 9310503  
 Lab ID: 93-0015393  
 Date Collected: 10/18/93 00:00  
 Collected By: Client  
 Date Received: 10/20/93 13:00

Client Project: 9375-002

Client Designation: 291-03/Church-1st Fl

	Conc.	Unit
	-----	-----
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube

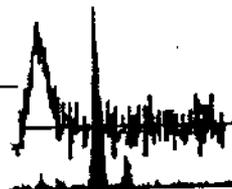
Attention: Jerry Knickerbacher  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/08/93  
 Project Number: 9310503  
 Lab ID: 93-0015394  
 Date Collected: 10/18/93 00:00  
 Collected By: Client  
 Date Received: 10/20/93 13:00

Client Project: 9375-002

Client Designation: 291-04/Church-1st Fl

	Conc.	Unit
	-----	-----
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube



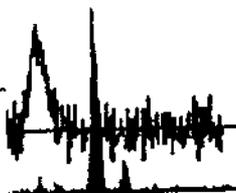
Attention: Jerry Knickerbacher  
 K-D Associates  
 P.O. Box 4326  
 Burlington VT 05406-4326

Date of Report: 11/08/93  
 Project Number: 9310503  
 Lab ID: 93-0015395  
 Date Collected: 10/18/93 00:00  
 Collected By: Client  
 Date Received: 10/20/93 13:00

Client Project: 9375-002

Client Designation: 291-05/14 Wash. St

	Conc.	Unit
	-----	-----
ORGANIC		
Volatiles		
1,1,2,2-Tetrachloroethane	<0.25	ug/tube
1,1-Dichloroethane	<0.25	ug/tube
1,1,1-Trichloroethane	<0.25	ug/tube
1,2-Dichloroethane	<0.25	ug/tube
1,2-Dichloropropane	<0.25	ug/tube
1,1,2-Trichloroethane	<0.25	ug/tube
Benzene	<0.25	ug/tube
Bromodichloromethane	<0.25	ug/tube
Bromoform	<0.25	ug/tube
Bromomethane	<0.5	ug/tube
Carbon tetrachloride	<0.25	ug/tube
cis-1,3-Dichloropropene	<0.25	ug/tube
Chlorobenzene	<0.25	ug/tube
Chlorodibromomethane	<0.25	ug/tube
Chloroethane	<0.5	ug/tube
Chloromethane	<0.5	ug/tube
Chloroform	<0.25	ug/tube
1,1-Dichloroethene	<0.25	ug/tube
Ethylbenzene	<0.25	ug/tube
Methylene chloride	<0.5	ug/tube
Tetrachloroethene	<0.25	ug/tube
Trichloroethene	<0.25	ug/tube
trans-1,2-Dichloroethene	<0.25	ug/tube
trans-1,3-Dichloropropene	<0.25	ug/tube
Toluene	<0.25	ug/tube
Trichlorofluoromethane	<0.5	ug/tube
Vinyl chloride	<0.5	ug/tube
Xylenes (total)	<0.25	ug/tube





METHODOLOGY

All analyses are adapted from one or more of the following reference methods:

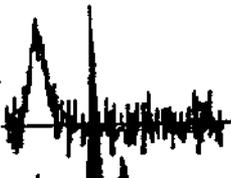
- . "Guidelines Establishing Test Procedures for the Analysis of Pollutants", Code of Federal Regulations Vol. 40, Part 136.
- . "Test Methods for Evaluating Solid Waste", SW846 Third Edition, September 1986, USEPA.
- . Code of Federal Regulations Vol. 40, Part 261, "Appendix II-Method 1311 Toxicity Characteristic Leaching Procedure (TCLP)".
- . "Standard Methods for the Examination of Water and Wastewater", 15th, 16th and 17th editions.
- . "Methods for the Chemical Analysis of Water and Wastes", EPA 600/4-79-020, March 1983, EMSL.
- . "Annual Book of Standards, Section 11-Water", American Society for Testing and Materials (ASTM).
- . "Methods for the Determination of Organic Compounds in Drinking Water", EPA 600/4-88/039, December 1988.

DEFINITIONS

- U: Not Detected
- B: Compound found in method blank
- E: Estimated Concentration
- J: Compound detected, however below report detection limit.
- NFL: No Free Liquid
- NR: Not Reactive
- NA: Not Applicable
- NS: Not Requested
- NI: Not Ignitable

COMMENTS

All soil samples are calculated on a dry weight basis except as noted.



Attention: Jerry Knickerbacher  
 K-D Associates  
 P.O. Box 4326  
 Burlington, VT 05406-4326

Project #: 9310505  
 Date Received: 10/20/93 13:00

The following results are for Petroleum Hydrocarbons, Total (I.R)

Lab #	Conc.	Unit	Client Designation
93 0015401	840	mg/kg	09-01 (5-10')
93 0015402	280	mg/kg	09-02 (10-13')
93 0015403	59	mg/kg	09-03 (13'6")
93 0015404	890	mg/kg	10-01 (6-8')
93 0015405	910	mg/kg	10-02 (12')
93 0015406	180	mg/kg	10-03 (14')
93 0015407	99	mg/kg	11-01 (8-10')
93 0015408	140	mg/kg	11-02 (11-12')
93 0015409	8400	mg/kg	12-01 (6-8')
93 0015410	17000	mg/kg	12-02 (8-11')
93 0015411	270	mg/kg	13-01 (5-10')
93 0015412	240	mg/kg	13-02 (10-11')
93 0015413	780	mg/kg	13-03 (11-13')
93 0015414	210	mg/kg	14-01 (4-6')
93 0015415	1100	mg/kg	14-02 (8-10')
93 0015416	500	mg/kg	14-03 (10-11'6")
93 0015417	140	mg/kg	15-01 (2-6')
93 0015418	210	mg/kg	15-02 (6-8')
93 0015419	200	mg/kg	15-03 (11-14')
93 0015420	200	mg/kg	16-01 (6-8')
93 0015421	270	mg/kg	16-02 (10-12')
93 0015422	190	mg/kg	16-03 (13-14')
93 0015423	230	mg/kg	17-01 (10-12')
93 0015424	140	mg/kg	17-02 (12-14')
93 0015425	550	mg/kg	17-03 (14-15'6")
93 0015426	110	mg/kg	18-01 (13-14')
93 0015427	210	mg/kg	18-02 (14-15')
93 0015428	290	mg/kg	18-03 (16-17')

The following results are for Solids, Total

Lab #	Conc.	Unit	Client Designation
93 0015401	89	%	09-01 (5-10')
93 0015402	86	%	09-02 (10-13')
93 0015403	78	%	09-03 (13'6")
93 0015404	88	%	10-01 (6-8')
93 0015405	96	%	10-02 (12')
93 0015406	76	%	10-03 (14')

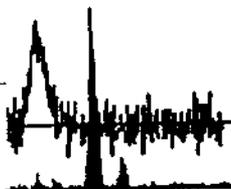


Attention: Jerry Knickerbacher  
K-D Associates  
P.O. Box 4326  
Burlington, VT 05406-4326

Project #: 9310505  
Date Received: 10/20/93 13:00

The following results are for Solids, Total

Lab #	Conc.	Unit	Client Designation
93 0015407	87	%	11-01 (8-10')
93 0015408	76	%	11-02 (11-12')
93 0015409	91	%	12-01 (6-8')
93 0015410	79	%	12-02 (8-11')
93 0015411	91	%	13-01 (5-10')
93 0015412	87	%	13-02 (10-11')
93 0015413	77	%	13-03 (11-13')
93 0015414	95	%	14-01 (4-6')
93 0015415	87	%	14-02 (8-10')
93 0015416	91	%	14-03 (10-11'6")
93 0015417	89	%	15-01 (2-6')
93 0015418	87	%	15-02 (6-8')
93 0015419	89	%	15-03 (11-14')
93 0015420	86	%	16-01 (6-8')
93 0015421	91	%	16-02 (10-12')
93 0015422	81	%	16-03 (13-14')
93 0015423	87	%	17-01 (10-12')
93 0015424	87	%	17-02 (12-14')
93 0015425	74	%	17-03 (14-15'6")
93 0015426	75	%	18-01 (13-14')
93 0015427	83	%	18-02 (14-15')
93 0015428	76	%	18-03 (16-17')



METHODOLOGY

All analyses are adapted from one or more of the following reference methods:

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- . "Test Methods for Evaluating Solid Waste", SW846 Third Edition, September 1986, USEPA.
- . Code of Federal Regulations Vol. 40, Part 261, "Appendix II-Method 1311 Toxicity Characteristic Leaching Procedure (TCLP)".
- . "Standard Methods for the Examination of Water and Wastewater", 15th, 16th and 17th editions.
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- . "Methods for the Determination of Organic Compounds in Drinking Water", EPA 600/4-88/039, December 1988.

DEFINITIONS

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B: Compound found in method blank  
E: Estimated Concentration  
J: Compound detected, however below report detection limit.  
NFL: No Free Liquid  
NR: Not Reactive  
NA: Not Applicable  
NS: Not Requested  
NI: Not Ignitable

COMMENTS

All soil samples are calculated on a dry weight basis except as noted.

# Sample Collection/Analytical Techniques

## Field Soil Screening

Soil samples collected by K-D Associates, Inc. from excavations by backhoe or samples from soil borings for investigative or monitoring well installation were screened in the field using a photoionization detector (PID). K-D Associates, Inc. uses a Photovac MicroTIP™ with a 10.6 eV lamp which is calibrated, depending on use, at least once each day of use to isobutylene (100 ppm in air). The technique for determining hydrocarbon content is known as the headspace technique. This procedure involves placing approximately 250 grams or no more than half of the volume in a sterile polyethylene bag avoiding vegetation or stones larger than 1/2" in diameter. The bag is then sealed, leaving sufficient air enclosed to later be withdrawn as a headspace sample. The sample may then be kneaded to homogenize the sample and, if necessary, warm the sample to approximately 70° F for 5 to 10 minutes. The instrument's probe is then carefully inserted into the bag making sure that the bag is not further agitated and that it is gathered around the probe to prevent dilution of the sample by outside make-up air. The highest reading that remains constant for 1-2 seconds is then recorded. Results are displayed in parts per million (ppm). Depending on the amount of soil available from a specific area/depth, a second or third sample is screened and the results averaged. Individual samples may not be re-used.

Investigative work completed on this project prior to K-D Associates, Inc.'s involvement reportedly utilized an organic vapor meter (OVM) with a 10.0 eV lamp. Properly calibrated to isobutylene, an OVM should produce results comparable to a PID if sample handling techniques are also comparable.

## Laboratory Soil Analysis

Samples showing the highest PID readings, or those collected from specific locations (e.g. tank bottom) are also submitted for laboratory analysis. Using sterile sample handling techniques, a sample is tightly sealed in a sample vial and refrigerated until received by the laboratory. Analysis by EPA Method 418.1 - Total Petroleum Hydrocarbons reports the total hydrocarbon concentration including those components with ionization potentials above and below the sensitivity of the PID and is reported in mg/kg (equivalent to ppm).

## **Air Sampling / Analysis**

Ambient indoor air sampling for the presence of VOC's (benzene in particular) utilized a calibrated, low-flow sampling pump and charcoal sorbent tube. Prior to sampling, the pump with a representative sorbent tube in place is calibrated with a rotometer to a flow rate between 0.01 and 0.2 Lpm depending on the compound of interest. The pump is then placed in an area avoiding interferences such as high humidity or air flows which might bias the result. Again, depending on the compound of interest, the pump is run for a period of time to collect a total volume recommended by the sorbent tube manufacturer and/or analytical methodology. After collection, the sorbent tubes are capped and sent to a laboratory for analysis for hydrocarbons by GC/MS as in NIOSH Methods 1003, 1500 and 1501.

The Vermont Department of Health specifies a background benzene level of no more than 2 ppb for residential air quality with a detection limit of 1ppb. A blank sample and background sample of the ambient outdoor environment is also collected to provide baseline information and quality control.

## **Water Sampling / Analysis**

For developed groundwater monitoring wells, the static water level in the well is measured to estimate the amount of water to be purged prior to sample collection. Typically, 3-5 well "volumes" of water are purged from the well to obtain water from the surrounding geologic materials avoiding disturbance of the regional flow system and stagnant water that has remained in the well casing for extended periods of time which would bias a representative sample.

Sample collection using a check-valve bailer is typically the most economical method of sample retrieval while still maintaining reliability and sensitivity for VOC's. Wells predicted to have the least potential for contamination should be sampled first to reduce cross-contamination and are expected to be representative of background quality. Care is taken to reduce splashing or otherwise disturbing the sample during collection or transfer to vials to avoid loss of volatile chemical constituents. Sample vials are slightly overfilled to avoid air bubbles when sealed. Sealed sample vials are then refrigerated until delivery to the lab.

Project Name Washington St. Apts.

Casing type N/A

Location 14 Washington St

Casing Diameter \_\_\_\_\_

Barrre, VT

Casing length \_\_\_\_\_

KDAI Proj. No. 9375-002

Screen type \_\_\_\_\_

Drilling Log No. B9

Screen length \_\_\_\_\_

Date 15 OCT 93

Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description
0		Soil Boring	
2		only	
4			ackly, fine sand w/ sm. cobbles
6			
8			
10			same plus bricks & debris
12		← 	fine silty sand
14		← terminated	↓
16			
18			
20			

Project Name Washington St. Apts

Casing type N/A

Location 14 Washington St.

Casing Diameter \_\_\_\_\_

Barrre, VT

Casing length \_\_\_\_\_

KDAI Proj. No. 9375-002

Screen type \_\_\_\_\_

Drilling Log No. B10

Screen length \_\_\_\_\_

Date 15 Oct 83

Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description
0			
2		coarse sand/w cobbles	
4			
6			
8			
10		hardpan, till	
12		← <u>terminated</u>	
14			
16			
18			
20			

Project Name Washington St. Apts

Casing type N/A

Location 14 Washington St

Casing Diameter \_\_\_\_\_

Ravine, VT

Casing length \_\_\_\_\_

KDAI Proj. No. 93 75-002-

Screen type \_\_\_\_\_

Drilling Log No. B11

Screen length \_\_\_\_\_

Date 15 OCT '93

Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description	
0				
2				
4			Sandy mixed fill	
6				
8			handpan, fill	
10				
12			← silty sand	
14			terminated	
16				
18				
20				

Project Name Washington St. Apts

Casing type N/A

Location 14 Washington St.  
Barre VT

Casing Diameter \_\_\_\_\_

Casing length \_\_\_\_\_

KDAI Proj. No. 9375-002

Screen type \_\_\_\_\_

Drilling Log No. B 12

Screen length \_\_\_\_\_

Date 15 OCT '93

Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description
0		<p>silty sand / w sm cobbles</p> <p>coarse sand, wet</p> <p>← <u>8</u></p>	
2			
4			
6			
8			
10			
12			
14			
16			
18			
20			
22			
24			

Project Name Washington St. Apts.

Casing type N/A

Location 14 Washington St.  
Barna, VT

Casing Diameter \_\_\_\_\_

Casing length \_\_\_\_\_

KDAI Proj. No. 9305-002

Screen type \_\_\_\_\_

Drilling Log No. B13

Screen length \_\_\_\_\_

Date 18 OCT 93

Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description
0			
2		gravel, rocky sand (black sand)	
4		coarse sand, gravel mix	
6			
8			
10		silty sand mix	
12		<u>▽</u>	
14			
16			
18			
20			



Project Name Washington St. Apts  
 Location 14 Washington St.  
Barre VT  
 KDAI Proj. No. 9375-002  
 Drilling Log No. B15  
 Date 18 OCT 93

Casing type N/A  
 Casing Diameter \_\_\_\_\_  
 Casing length \_\_\_\_\_  
 Screen type \_\_\_\_\_  
 Screen length \_\_\_\_\_  
 Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description	
0				
2				
4				
6				
8			hardpan / till	
10			coarse gray sand	
12				
14			← <u>▽</u>	
16				
18				
20				

Project Name Washington St. Apts  
 Location 14 Washington St  
Burrill VT  
 KDAI Proj. No. 9375-002  
 Drilling Log No. B16  
 Date 18 OCT

Casing type N/A  
 Casing Diameter \_\_\_\_\_  
 Casing length \_\_\_\_\_  
 Screen type \_\_\_\_\_  
 Screen length \_\_\_\_\_  
 Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description
0			
2		tan sandy gravel	
4			
6		compacted gravel/coarse sand	
8			
10		coarse gray sand	
12			
14		← <u>ST</u>	
16			
18			
20			

Project Name Washington St. Apts.  
 Location 14 Washington St.  
Barre, VT  
 KDAI Proj. No. 5375-002  
 Drilling Log No. B17  
 Date 18 Oct 93

Casing type N/A  
 Casing Diameter \_\_\_\_\_  
 Casing length \_\_\_\_\_  
 Screen type \_\_\_\_\_  
 Screen length \_\_\_\_\_  
 Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description
0			
2		gravel/sand, compacted	
4			
6		sand, coarse mixed w/ cobbles - grayed (stained)	
8			
10			
12		gray sticky sand, coarse	
14			
16		← <u>▽</u>	
18			
20			

Project Name Washington St. Apts

Casing type N/A

Location 14 Washington St  
Barre, VT

Casing Diameter \_\_\_\_\_

Casing length \_\_\_\_\_

KDAI Proj. No. 9325-002

Screen type \_\_\_\_\_

Drilling Log No. B18

Screen length \_\_\_\_\_

Date 19 OCT 93

Total length below ground \_\_\_\_\_

Depth (feet)	Well Construction	Notes	Description
0			
2		compacted gravel	
4		coarse sand w/cobbles	
6			
8		compacted coarse sand	
10			
12		sand/silty mix	
14			
16			
18			
20			

Project Name Washington St. Apts.

Casing type Sch 40 PVC

Location 14 Washington St.

Casing Diameter 2"

Barrre VT

Casing length 5' 9.5"

KDAI Proj. No. 4375-002

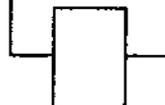
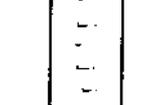
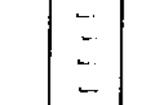
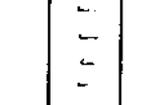
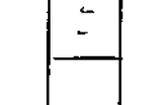
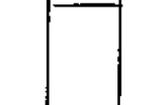
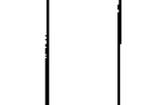
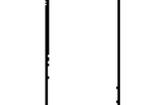
Screen type .01" PVC

Drilling Log No. MW-1

Screen length 15'

Date 12 Nov 93

Total length below ground 20' 9.5"

Depth (feet)	Well Construction	Notes	Description
0		<u>topsoil</u>	<u>[NE corner of lot]</u>
2		<u>coarse sand</u>	
4			
6			
8			
10		<u>11" 11"</u>	
12		<u>coarse sand/silty mix</u>	<u>[No contamination via PID]</u>
14			
16			
18			
20			
22			
24			

Project Name Washington St. Apts.

Casing type SC-140 PVC

Location 14 Washington St

Casing Diameter 2"

Barrre, VT

Casing length 6' 6"

KDAI Proj. No. 9275-002

Screen type .01 PVC

Drilling Log No. MW-7

Screen length 15'

Date 12- Nov 93

Total length below ground 21' 6"

Depth (feet)	Well Construction	Notes	Description
0		Sandy loam	NW corner out lot at curb
2		coarse sand w/ sm cobbles	
4			No contamination via PID
6		compacted, coarse	
8			
10			
12			← <del>11' 4.25"</del> 11' 4.25"
14			coarse sand/silt mix
16			
18			
20			
22			
24			

Project Name Washington St. Apts

Casing type Sch 40 PUC

Location 14 Washington St  
Barre, VT

Casing Diameter 2"

Casing length 8' 8"

KDAI Proj. No. 9375-02

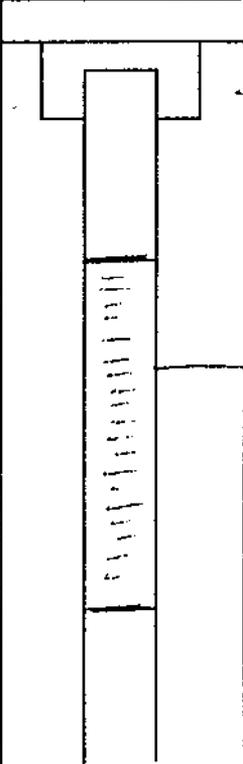
Screen type .01

Drilling Log No. MW-3

Screen length 15'

Date 12 NOV 93

Total length below ground 23' 8"

Depth (feet)	Well Construction	Notes	Description
0			
2		Gravel pack	[ Located in area at former tank piping ]
4			
6		Coarse sand	
8		gray, sticky	
10		fine slow	
12			
14		13' 4.75"	
16			
18			
20			
22			
24			
26			

Project Name Washington St. Apts. Casing type SCH 40 PVC  
 Location 14 Washington St Casing Diameter 2"  
Barre VT Casing length 12' 9"  
 KDAI Proj. No. 9375-002 Screen type .01  
 Drilling Log No. MW-4 Screen length 15'  
 Date 12 NOV 93 Total length below ground 27' 9"

Depth (feet)	Well Construction	Notes	Description
0		parked sand/gravel	located in alley/driveway between Apts & church
2		coarse sand/silty mix	
4			
6			
8			
10			
12		hardpack	
14		← 14' 1"	
16			
18		coarse sand	
20		gray - slight fuel odor	
22			
24			
26			
28			
30			