

Initial Site Investigation

June 1997

**Maple Street Site
East Haven, Vermont
DEC Site #96-2008**

20 11 59 AM '97

Prepared For:

**VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Waste Management Division
Sites Management Section
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THE JOHNSON COMPANY, INC.

Environmental Sciences and Engineering

June 19, 1997

Mr. Michael Young
Waste Management Division
Department of Environmental Conservation
103 South Main Street, West Building
Waterbury, Vermont 05671-0404

Re: Initial Site Investigation at Maple Street Site; East Haven, Vermont.
DEC Site #96-2008. JCO 1-2267-9(042).

Dear Mike:

We have completed our initial site investigation at the referenced Site in the Hartwellville neighborhood in East Haven, Vermont. The work involved a preliminary characterization of the hydrogeology and fuel-oil release conditions at the Site, followed by an intrusive site investigation to characterize petroleum contamination in the soil and groundwater. The investigation confirmed that there has been a release(s) of fuel oil to the subsurface. This condition is aggravated during high groundwater conditions that commonly occur subsequent to snowmelt and precipitation infiltration events in Spring. This is manifested by the flow of petroleum-contaminated water in some areas of the storm sewer system and in an open drainage ditch leading to a tributary of the East Branch of the Passumpsic River.

This report details the site investigation activities and presents recommendations for further actions at the Site. If you have any questions, please do not hesitate to call.

Respectfully Submitted,

THE JOHNSON COMPANY, INC.

By:



Eric R. Hanson, CGWP
Project Scientist

Reviewed By: arl
I:\PROJECTS\1-2267-9\INVSTGN.RPT June 18, 1997 erh

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EXECUTIVE SUMMARY

The Johnson Company performed an initial site investigation at the Maple Street Site in East Haven, Vermont (DEC Site #96-2008). This work was performed at the request of the Vermont Department of Environmental Conservation's Waste Management Division. The primary purpose of the investigation was to determine the source of soil and groundwater contamination by fuel oil that was first noted during the installation of a replacement storm sewer culvert under Maple Street in July 1996. The release of fuel oil has caused odor problems in the vicinity of the new culvert and also has resulted in soil and surface water contamination in the drainage ditch into which the storm sewer discharges. The drainage ditch, in turn, discharges to a tributary of the East Branch of the Passumpsic River. Petroleum sheens have been noted in this tributary where the drainage ditch enters.

The surrounding neighborhood is comprised of 27 homes that were built as military housing in the late 1950s associated with a nearby radar station. All the homes were originally equipped with 500 gallon underground storage tanks (UST) for the storage of fuel oil for the heating systems. In the mid-1960s, the housing development was sold by the U.S. Government and the homes became privately owned. Since that time, some residents have stopped using their USTs, switching to above ground storage tanks or propane gas. However, the majority of USTs, both used and unused, remain in the ground.

The investigation consisted of site walkovers, resident interviews, installation of temporary monitoring wells, groundwater sampling and analysis, and soil and sediment screening for volatile organic compound (VOC) vapors.

The site walkovers and resident interviews revealed that the noted contamination appears to be concentrated around the newly installed culvert and downstream in the drainage ditch, primarily during periods of high groundwater (i.e., Spring). The depth to groundwater is shallow beneath the neighborhood, which was reportedly built atop a filled former wetland.

Six temporary monitoring wells were installed in suspect areas of the site, and the soils at each of these locations were screened for the presence of VOC vapors. Groundwater samples were collected from the five monitoring wells that contained sufficient groundwater for sampling, and water level measurements and a level survey were performed to develop a groundwater contour map. The groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds and total petroleum hydrocarbons (TPH) at The Johnson Company analytical laboratory. Sediment samples collected from various locations within the storm sewer system were screened for the presence of VOC vapors.

The groundwater analytical results, and soil and sediment screening indicate that the groundwater in the vicinity of the USTs located at #12 and #14 Maple Street has been contaminated by a release of petroleum product. There is little to no contamination of the soil and groundwater evident upgradient of this location. Anecdotal information from the culvert installation contractor who indicated that the petroleum product was entering the excavation from the north and northeast sides, and the groundwater analytical results suggest that it may be more likely that the release is from the UST system located at #12 Maple Street.

In an attempt to stop the apparent current release of fuel oil, the UST at #12 Maple Street should be immediately closed. The contaminated soil in the vicinity of the UST should be removed so it does not continue to act as a source of groundwater contamination. Additionally, we recommend that all remaining USTs in the neighborhood be closed and replaced with alternative fuel storage systems to avoid likely future releases from these aging UST systems. To make this possible, The Johnson Company and Waste Management Division will need to explore possible funding mechanisms as it is unlikely that all private homeowners will assume the associated expenses.

1.0 INTRODUCTION

During the installation of a storm sewer culvert under Maple Street in East Haven, Vermont on July 11, 1996, petroleum contaminated groundwater (i.e., petroleum sheen) was noted by the contractor performing the installation. The contractor noted that the petroleum product and water had entered the excavation from the north/northeast side of the excavation. After discovery of the petroleum contamination, the release was reported to the Vermont Department of Environmental Conservation's Waste Management Division (WMD). In a May 19, 1997 letter, the WMD's Sites Management Section (SMS) approved a work plan submitted by The Johnson Company on July 22, 1996 for a site investigation at the Maple Street Site (Figure 1).

The culvert was installed within a neighborhood comprised of 27 homes that were built as military housing in the late 1950s associated with a nearby radar station. All the homes are constructed on concrete slabs with no basements. Operation of the radar station ceased in the early 1960s. In 1965, the 27 homes were sold to a private concern that sold the houses individually to private homeowners. In 1966, the three roads serving the development (Maple Street, Cross Street, and Haven Street) became town roads (i.e., the upkeep and maintenance of the roads became the Town of East Haven's responsibility).

The 27 former Air Force residences within the neighborhood, Hartwellville (within the Town of East Haven), are served by community water and sewer services. Each of these homes was originally equipped with a 500 gallon underground storage tank (UST) for the storage of home heating oil (#2 fuel oil) when built by the U.S. Government. Over the years, some of the private homeowners have equipped their homes with above ground storage tanks for the storage of heating oil or have switched to propane gas heat and have stopped using the USTs. Some of the unused USTs have been removed. However, some unused USTs, in addition to all the USTs still in service, remain in-place around the neighborhood. The most likely source of the noted petroleum contamination is one or more of the remaining USTs.

2.0 SITE INVESTIGATION

The Johnson Company performed an initial site investigation on May 22 and June 9, 1997. This work consisted of:

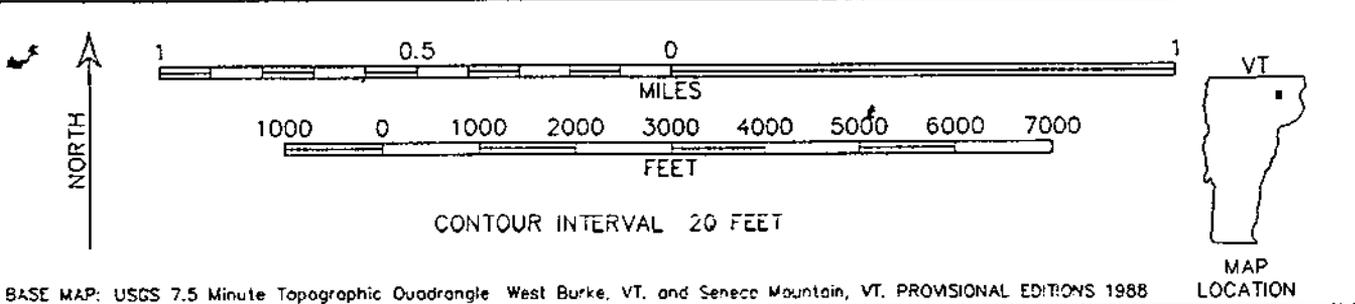
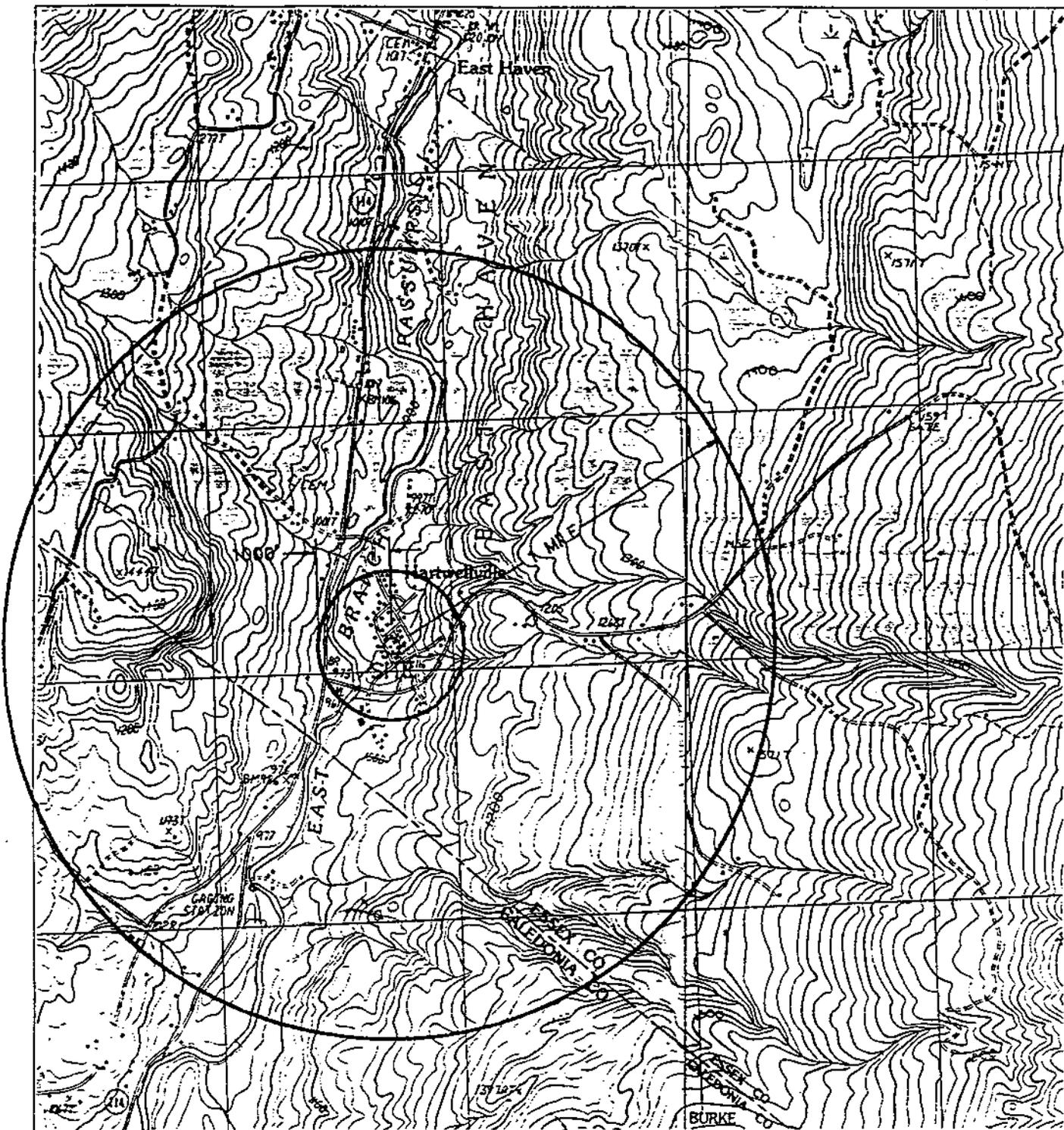


FIGURE 1 : Site Location Map
 Maple Street Site
 East Haven, Vermont

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- site walkovers to assess the current status of fuel oil contamination and underground utilities on the Site,
- interviews with neighborhood residents screening of volatile organic compound (VOC) vapors in sediment samples collected from the Site's storm sewer system,
- the installation of six temporary groundwater wells,
- screening of VOC vapors in soils at the monitoring well locations, and
- the collection of groundwater samples for analysis for benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds and total petroleum hydrocarbons (TPH).

All work performed was done in accordance with a health and safety plan as required by the Occupational Safety and Health Administration regulations 29 CFR 1910.120.

2.1 SITE WALKOVERS

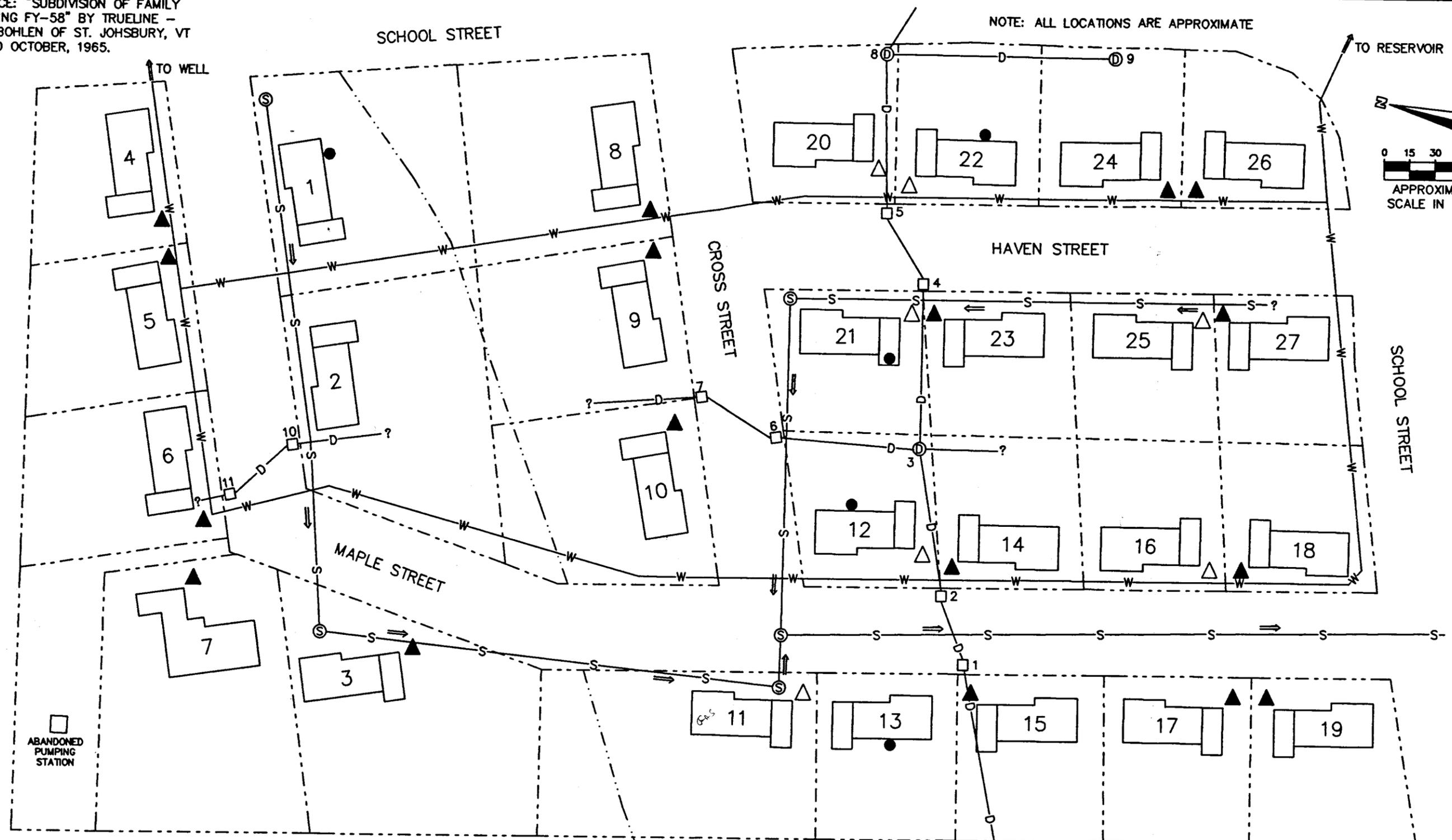
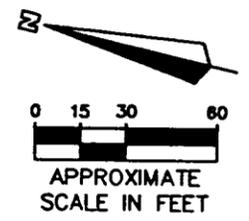
We performed two separate site walkovers on May 22 and June 9, 1997 to inspect the status of the fuel oil contamination on the Site. During the May 22, 1997 site visit, the groundwater level was elevated from Spring snowmelt and precipitation events. Water flow was occurring through the culvert installed in July 1996 (as noted in storm grates #1 and #2) and the downstream drainage ditch that empties into a tributary of the East Branch of the Passumpsic River (Figure 2). A petroleum-like sheen was noted on the water surface at these locations, and a fuel-oil odor was noted along the drainage ditch. When the soils in the drainage ditch were disturbed, additional sheen was released onto the surface of the water. Further upstream, at the storm sewer manhole located behind #12 Maple Street (manhole #3) and storm grates #4 and #5, there was no flow of water and no odors or sheens noted.

We mapped the storm sewer system to the degree possible by observing the locations of storm grates, manholes, and associated subsurface piping as shown on Figure 2. The invert elevation of all piping is approximately four feet below grade. Also, we acquired maps of the subsurface water supply and sanitary sewer piping with the locations also shown on Figure 2.

During the May 22, 1997 site walkover, we excavated a three-inch diameter core hole using a hand auger several feet to the southwest of the southwest corner of #12 Maple Street to check soil and groundwater conditions. The soil was noted to be sandy fill over medium sand to a depth of 6.8 feet with the groundwater surface at 3.8 feet. Based on the conditions noted at this location, we determined it may be possible to install temporary groundwater monitoring wells using a hand auger rather than motorized well drilling equipment during our subsequent intrusive investigation. This would result in less disturbance to the private yards where the intrusive investigation was to occur.

SOURCE: "SUBDIVISION OF FAMILY HOUSING FY-58" BY TRUJELINE - R.N. BOHLEN OF ST. JOHSBURY, VT DATED OCTOBER, 1965.

NOTE: ALL LOCATIONS ARE APPROXIMATE



ABANDONED PUMPING STATION

KEY

- | | | | |
|-----|------------------------|---|---------------------------------|
| —S— | SANITARY SEWER PIPING | △ | UNUSED UNDERGROUND STORAGE TANK |
| ⊙ | SANITARY SEWER MANHOLE | ▲ | IN-USE UNDERGROUND STORAGE TANK |
| —D— | STORM SEWER PIPING | ● | ABOVE GROUND STORAGE TANK |
| □ | STORM SEWER GRATE | | |
| ⊙ | STORM SEWER MANHOLE | | |
| —W— | 6" WATERLINE | | |

TRIBUTARY TO THE EAST BRANCH OF PASSUMPSIC RIVER

DRAINAGE DITCH TO TRIBUTARY OF THE EAST BRANCH

FIGURE 2: UNDERGROUND UTILITIES & STORAGE TANKS

SITE SKETCH MAP
FAMILY HOUSING DEVELOPMENT
EAST HAVEN, VERMONT

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Prior to beginning intrusive investigation activities performed on June 9, 1997, we performed a second site walkover. During this site walkover, we noted that the drainage ditch and all storm sewer pipes were no longer conveying flow. However, when the soils were disturbed near the end of the drainage ditch, where it enters the tributary to the East Branch, that a petroleum-like sheen was released onto the surface of the water flowing in the tributary. A slight odor of fuel oil was noted while walking in close proximity to the drainage ditch.

2.2 RESIDENT INTERVIEWS

Ms. Lillian Harrington, who lives at #15 Maple Street, indicated that during May 1997, there had been strong odors of petroleum in the vicinity of her house. This house is located immediately downgradient of the culvert that was replaced in July 1996. The storm sewer piping terminates at the drainage ditch that begins just behind the house. Therefore, vapors exiting storm grates #1 and #2 on Maple Street, and from the end of the storm sewer pipe and drainage ditch behind the house account in large part for the odors being noted. Elevated groundwater levels during May 1997 resulted in water flow through the storm sewer and drainage ditch in the vicinity of this house. The furnace in Ms. Harrington's house is still served by the UST on her property.

Mr. Robert Soulia of #12 Maple Street, just upgradient of the culvert installed in July 1996, indicated that he no longer uses the UST on his property and now uses an above ground storage tank for fuel oil located immediately behind the house. He indicated that approximately 100 gallons of fuel oil remain in the UST. Mr. Richard Harrington of #14 Maple Street, immediately to the south of Mr. Soulia's, indicated that he had the soils around his UST excavated last summer to perform some piping reconfiguration. He reported that he noted no indications of any leaks occurring from the UST or associated piping. Mr. Harrington's furnace is still served by the UST on his property. Both Mr. Soulia and Mr. Harrington indicated that the housing development had occurred atop a filled wetland area.

Of the other homes located along the storm sewer system upgradient of the replaced culvert location, the homes at #20, #21 and #22 Cross Street now use above ground tanks, although the USTs are still in the ground. The furnace at #23 Cross Street is still connected to the UST system. The status of all USTs within the 27 home neighborhood is shown on Figure 2.

2.3 INTRUSIVE SITE INVESTIGATION

We performed the installation of the temporary monitoring wells, groundwater sample collection, and soil and sediment VOC vapor screening activities on June 9, 1997.

2.3.1 *Temporary Monitoring Wells*

2.3.1.1 *Installation*

Based on the soil profile and shallow depth to groundwater noted during the May 22, 1997 site walkover, we installed six temporary monitoring wells using hand-operated soil augers at the locations shown on Figure 3. To do so, we used the hand augers to excavated three-inch diameter coreholes into the water table. The hand augers were thoroughly decontaminated using soapy water with a deionized water rinse between each of the coring locations. After the completion of each corehole, we installed temporary monitoring wells constructed of two-inch diameter PVC machine slotted screen (0.010-inch slots) and two-inch diameter PVC solid riser. Because of the sandy texture of the native soils, no additional sandpack was installed around the screens. Additionally, because the wells were installed, sampled, and removed on the same day, no bentonite seal was placed around the well casings.

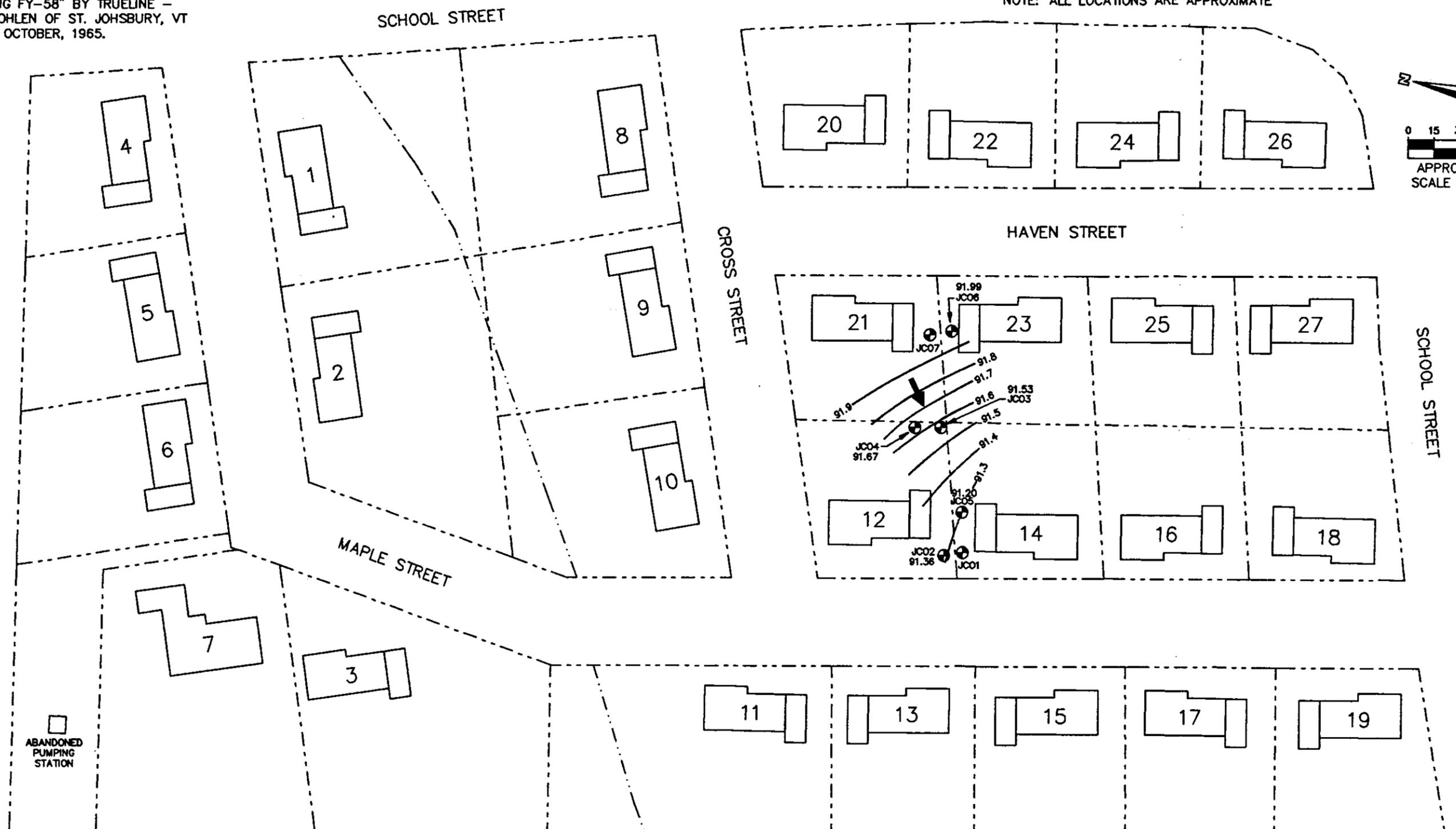
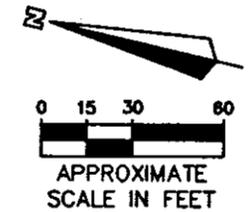
Difficult (i.e., stony) augering conditions at depth at each of the monitoring well locations prohibited us from augering into the water table more than approximately one foot. In one instance, at monitoring well JCO-6, it prevented the well from encountering groundwater, although saturated soils were noted at the bottom of the corehole. Also, we attempted to install a seventh monitoring well (JCO-7) at the location identified on Figure 3, but this was prevented due to difficult augering conditions.

2.3.1.2 *Soil Screening*

During the advancement of each of the coreholes, soil stratigraphy was characterized and soil samples were collected for screening for the presence of VOC vapors via headspace analyses using a photoionization detector (PID). To do so, soil samples were placed into resealable plastic bags, sealed, and allowed to sit in the sun for a minimum of five minutes (the weather during the site investigation was sunny and 80°F) at which time the tip of the PID was inserted into the bag and the highest reading observed was recorded. The PID used during the site investigation was a Thermo-Environmental Model 580B OVM calibrated on-site to 100 parts per million (ppm) isobutylene gas.

SOURCE: "SUBDIVISION OF FAMILY HOUSING FY-58" BY TRUELINE - R.N. BOHLEN OF ST. JOHSBURY, VT DATED OCTOBER, 1965.

NOTE: ALL LOCATIONS ARE APPROXIMATE



ABANDONED PUMPING STATION

KEY

JC02

 91.36
 TEMPORARY MONITORING WELL LOCATION W/STATIC GROUNDWATER ELEVATION ON JUNE 9, 1997

91.6 ———
 0.1' GROUNDWATER CONTOUR - 6/9/97

➔
 GENERAL DIRECTION OF HORIZONTAL GROUNDWATER FLOW

TRIBUTARY TO THE EAST BRANCH OF PASSUMPSIC RIVER

DRAINAGE DITCH TO TRIBUTARY OF THE EAST BRANCH

FIGURE 3: TEMPORARY MONITORING WELLS & GROUNDWATER CONTOURS

SITE SKETCH MAP
 FAMILY HOUSING DEVELOPMENT
 EAST HAVEN, VERMONT

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2.3.1.3 Level Survey and Groundwater Sampling

After all of the groundwater monitoring wells were installed, groundwater levels were measured using an electronic water level indicator, groundwater samples were collected for laboratory analysis, and a level survey of the tops-of-casing and ground surface was performed at each of the monitoring well locations. Groundwater samples were collected by using a peristaltic pump with polyethylene tubing inserted into the well to act as the suction line, and by using disposable HDPE bailers in order to obtain sufficient volume of groundwater from each monitoring well. All groundwater samples were collected in 40-milliliter (mL) VOA vials preserved with hydrochloric acid (HCl) and were placed immediately into a chilled sample cooler upon collection until their delivery to The Johnson Company laboratory for analysis for BTEX and TPH. Details of each of the monitoring wells are presented in Table 1.

MW ID	Soil Stratigraphy	PID Headspace Reading (ppm)	TOC Elevation (ft)	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft)
JCO-1	0-0.7': brown sandy loam. 0.7-6.3': light brown, humid-sat., silty med. sand. 6.3-6.5': grayish brown, sat., silty medium sand.	Background 391	100.00 (arbitrary datum)	9.84	90.16
JCO-2	0-1.4': brown med. sand w/little gravel. 1.4-1.8': dk. brown fine sand. 1.8-2.6': brown coarse sand and gravel. 2.6-3.5': tan, silty fine sand w/little coarse sand. 3.5-6.7': gray fine sand w/brown staining, sat. at ~5.2'.	73 in hole 113 below water table	100.36	9.00	91.36
JCO-3	0-1.5': brown sandy loam. 1.5-4.8': lt. brown & grayish brown, humid-sat. med. silty sand becoming coarser at 2.5'. Refusal on stones.	4	96.37	4.84	91.53
JCO-4	0-2': brown med. sand w/little gravel. 2-3.1': medium-coarse sand w/gravel. 3.2-3.9': fine-med. sand. 3.9-4.3': coarse sand and gravel. 4.3-4.5'; gray, sat. fine-med. sand.	6	100.57	8.90	91.67

Table 1: Monitoring Well Details

MW ID	Soil Stratigraphy	PID Headspace Reading (ppm)	TOC Elevation (ft)	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft)
JCO-5	0-1.4': brown sandy loam. 1.4-1.9': gray medium sand. 1.9-2.7': lt. reddish brown silty med. sand. 2.7-6': grayish brown med. to coarse silty sand.	47 below water table	101.36	10.16	91.20
JCO-6	0-0.7': brown fine sandy loam. 0.7-2.5': stony sand fill. 2.5-4.5': brown med. silty sand. 4.5-6.7': brown med. sand, coarser w/stones at 6.7'.	3 at water table (~6.7')	102.53	Dry to 10.23	~91.99 (based on saturated soils noted at bottom of corehole)
JCO-7	0-2.8': brown and tan med.-coarse sand, very stony. Refusal at 2.8'.	3	No well	No well	No well

Note: ft btoc = feet below top of casing

The groundwater contours developed from the data presented in Table 1 are shown on Figure 3. Because the groundwater surface elevation at temporary monitoring well JCO-1 appears to be anomalously low, possibly because the water level had not yet stabilized at the time of measurement, this data point was not used in the development of the groundwater contour map. As can be noted on Figure 3, the groundwater flow direction is towards the southwest at a very low gradient as would be expected given the hydrogeologic setting of the Site.

2.3.2 Storm Sewer Sediment Screening

We collected samples of sediment for screening for the presence of VOC vapors via headspace analyses using the PID. To do so, we used the same methodology as used for the soil screening performed during the installation of the temporary monitoring wells. The sediment samples were collected using a decontaminated hand auger. We collected five sediment samples for screening from four access points along the storm sewer system as follows:

- 1) Sediment Sample 1 (SS1): From storm grate #2 at the upstream end of the culvert installed in July 1996.
- 2) SS2: From the storm sewer pipe heading towards the south from manhole #3.
- 3) SS3: From the storm sewer pipe heading towards the west from manhole #3.

- 4) SS4: From storm grate # 4 at the downstream end of the culvert passing beneath Haven Street.
- 5) SS5: From storm grate #6 at the south end of the culvert passing beneath Cross Street.

The results of the headspace analyses of the sediment samples are presented in Table 2.

Sample ID	PID Reading (ppm)
SS1	166
SS2	3 (background)*
SS3	2 (background)
SS4	1 (background)
SS5	2 (background)

*Background PID readings in open air fluctuated between 1 and 3 ppm

As can be noted, the only sediment sample containing significantly elevated concentrations of VOC vapors is SS1, collected from the culvert where the fuel oil contamination was first noted.

3.0 RESULTS

The results of the soil and sediment headspace analyses are presented in Tables 1 and 2. The analytical results of the groundwater sampling are summarized in Table 3. The complete analytical report is included in Appendix A.

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	TPH
JCO-1	68	130	70	440	130,000
JCO-2	230	1,000	270	3,300	270,000
JCO-3	<1	<1	<1	2	130
JCO-4	<1	<1	<1	<1	<100
JCO-5	16	170	83	810	39,000
Groundwater Standard	1.0 ¹ 5.0 ^{2,3,4}	1000 ^{2,4} 2420 ³	700 ^{2,4} 680 ³	10,000 ^{2,4} 400 ³	No Standard

¹ Vermont Health Advisory (HA).
² Federal Maximum Contaminant Level (MCL).
³ Present Groundwater Enforcement Standard.
⁴ Proposed Groundwater Enforcement Standard.

Elevated BTEX and TPH concentrations are present in the groundwater samples collected from temporary monitoring wells JCO-1, JCO-2, and JCO-5. These three monitoring wells are located in the vicinity of two fuel oil USTs: the one that formerly served the heating system for #12 Maple Street, and the one that currently serves the heating system for #14 Maple Street. A slightly elevated concentration of xylenes and TPH is noted in the groundwater sample collected from temporary monitoring well JCO-3.

4.0 DISCUSSION

Based on the work performed during the initial site investigation, petroleum-contaminated soil and groundwater is present in the vicinity of the fuel oil USTs present at #12 and #14 Maple Street. Further upgradient along the storm sewer, little or no petroleum contamination is noted in the soil and groundwater. This pattern is mimicked by the results of the storm sewer sediment screening, where the only elevated headspace PID readings were noted in the sediment that has collected in the culvert installed last summer. Therefore, it appears that there has been a release from one or both of the UST systems at #12 and #14 Maple Street. Anecdotal information from the culvert installation contractor who indicated that the petroleum product was entering the excavation from the north and northeast sides, groundwater flow direction from the northeast towards the southwest, and the groundwater analytical results that indicate higher BTEX and TPH concentrations in the groundwater sample collected from temporary monitoring well JCO-2, suggest that it may be more likely that the release is from the UST system at #12 Maple Street.

Petroleum-contaminated groundwater from this apparent source zone has likely affected groundwater quality downgradient of this area; however, the sampling performed during this initial site investigation did not include additional downgradient sampling locations. It appears likely that, during periods of high groundwater (primarily in the Spring), petroleum-contaminated groundwater enters the storm sewer system in the vicinity of the culvert that was installed last summer and flows through the storm sewer to the open drainage ditch that begins behind #15 Maple Street. Soils within the drainage ditch have been contaminated with the fuel oil. The drainage ditch is on the property of Mr. Frank Higgins, East Haven Town Clerk. Anecdotal information from Ms. Harrington concerning petroleum odors in the area confirm the vapors are strongest in the Spring during periods of high groundwater.

5.0 RECOMMENDATIONS

In an attempt to stop the apparent current release of fuel oil, the UST at #12 Maple Street should be immediately removed (closed). Based on the information during this investigation, this is the more suspect UST. This UST is unused and there is no reason for it to remain in the ground. The contaminated soil in the vicinity of the UST should be removed so it does not continue to act as a source of groundwater contamination. Ideally, this work should occur during a period of low groundwater in the late summer/early fall. If it is determined during the closure that leakage was not occurring from this UST, the UST at #14 Maple Street should be closed. If this closure occurs, arrangements will need to be worked out with Mr. Harrington for the replacement of his fuel oil storage system.

It may be prudent to remove soils that have become contaminated that are present in the drainage ditch on Mr. Higgins' property. Contaminated soils in this ditch may be acting as a source of surface water contamination in the tributary of the East Branch of the Passumpsic River into which the ditch empties. The Johnson Company would like to determine with the SMS whether the UST closure/soil treatment work is eligible for reimbursement by the Petroleum Cleanup Fund (PCF). Costs associated with the UST closure work and PCF deductible may be too expensive for the homeowners to afford.

The USTs that remain in the ground in the neighborhood are all approximately 37 years old or more. Deterioration of the USTs and associated piping over time will undoubtedly result in more fuel oil releases if these UST systems remain in place. Because of the relatively high density of homes on small lots in the neighborhood and the density of underground utilities, intrusive remedial techniques (e.g., soil removal, soil vapor extraction systems) that may need to be employed to address fuel oil releases to the subsurface would be highly disruptive to residents' homes and land. Therefore, we recommend that the USTs be closed before additional soil and groundwater contamination occur that may be caused by future releases. To minimize disruption of the residential properties, we recommend that the SMS consider closure-in-place of the USTs.

Given the expense of having the USTs removed, it is likely that as homeowners switch to alternative fuel storage systems over time, many abandoned USTs will remain in the ground. Thus, the potential for additional releases of fuel oil to the subsurface may remain for several years to come. Therefore, on a broader scale, The Johnson Company would like to explore possible funding options with the SMS for the closure of the USTs within the neighborhood. We believe that the closure of the USTs is the only way that additional releases of fuel oil to the subsurface in the neighborhood will be avoided given the advanced age of the UST systems.

Appendix A
Laboratory Analytical Results

The Johnson Company
GC Laboratory Results Sheet

All water analyses reported as ug/L.
All soil analyses reported as ug/Kg.

Sample Name	Lab ID	DF	Benzene	Q	Toluene	Q	Ethylbenzene	Q	Total Xylenes	Q	SS%	*TPH
Sample date = 6/9/97		Analysis Date = 6/13/97										
VT, DEC SITE # 96-2008 E. HAVEN VT - JCO #1-2267-9												
JCO-1	VT001	24	68		130		70		440		93	130000
JCO-2	VT002	48	230		1000		270		3300		**	270000
JCO-3	VT003	1	1	U	1	U	1	U	2		103	130
JCO-4	VT004	1	1	U	1	U	1	U	1	U	105	<100
JCO-5	VT005	48	16		170		83		810		103	39000

* TPH values based a one point calibration curve with diesel fuel as the standard.

** Surrogate interference was observed in this sample.

U = Undetected, value given is reporting limit.

J = Estimated value.

Z = Value given is marginally above calibration range.