



TWIN STATE ENVIRONMENTAL CORP.

P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477

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802-654-8663

January 22, 1999

Mr. Jim Driver
R.L. Vallee, Inc.
280 South Main Street
P.O. Box 192
St. Albans, Vermont 05478

**RE: Initial Site Investigation
P.J.'s Market - Route 100 - Morrisville, Vermont
TSEC Project #98-047, SMS Site #88-0235**

Dear Mr. Driver

Twin State Environmental Corporation (TSEC) has prepared the enclosed SITE investigation report to detail the findings of recent subsurface activities at P.J.'s Market in Morrisville, Vermont (SITE). The activities, completed following a request by the State of Vermont Sites Management Section, were intended to determine the degree and extent of petroleum contamination to the subsurface following the closure of diesel product piping and a pump island.

A total of five (5) soil borings were completed at the SITE using TSEC's Geoprobe® direct push soil sampling unit. Four (4) of the soil borings were completed as groundwater monitoring wells. Soil samples were collected from each boring and field screened with a photoionization detector (PID) for the presence of volatile organic compounds (VOCs). One (1) boring, advanced proximate to the former pump island, contained detectable levels of VOCs, as indicated by positive PID readings. Values ranged between <0.1 parts per million volume (ppmv) and 0.4 ppmv. No other samples contained detectable levels of VOCs.

Groundwater samples were collected from the four (4) newly installed groundwater monitoring wells and analyzed for VOCs via US EPA Method 8021B, and for TPH as fuel oil via US EPA Method 8100M. There were no target VOCs detected in any of the groundwater samples analyzed. TPH concentrations were found to range from <400 micrograms per liter ($\mu\text{g/l}$) to 630 $\mu\text{g/l}$.

TSEC has recommended that one (1) additional groundwater monitoring well be installed adjacent to the northwest corner of the SITE building, and that one (1) round of groundwater sampling be conducted at the SITE. If contaminant levels are similar to the July 1998 levels, the SITE should be considered for a Sites Management Activity Completed (SMAC) designation.

Please feel free to contact me at (802) 434-3350 to discuss our findings or other matters of concern.

Sincerely,

TWIN STATE ENVIRONMENTAL CORPORATION


Jon Berntsen
Project Manager

cc: Mr. Chuck Schwer, Sites Management Section



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Phase (check one)	Type (check one)
<input checked="" type="checkbox"/> Site Investigation	<input type="checkbox"/> Work Scope
<input type="checkbox"/> Corrective Action Feasibility Investigation	<input checked="" type="checkbox"/> Technical Report
<input type="checkbox"/> Corrective Action Plan	<input type="checkbox"/> PCF Reimbursement Request
<input type="checkbox"/> Corrective Action Summary Report	<input type="checkbox"/> General Correspondence
<input type="checkbox"/> Operations & Monitoring Report	

INITIAL SITE INVESTIGATION

January 22, 1999

**P.J.'s Market
Route 100
Morrisville**

**SMS Site # 88-0235
UST Facility #1671
TSEC Project # 98-047**

Facility Owned By:
R.L. Vallee, Inc.
280 South Main Street
P.O. Box 192
St. Albans, VT 05478
Contact: Mr. Jim Driver
(802) 524-8710

Written By:

Jon Berntsen
Project Manager

Reviewed By:

John R. Diego
Vice President

1.0 INTRODUCTION

This Initial Site Investigation (ISI) Report has been prepared by Twin State Environmental Corporation (TSEC), on behalf of R.L. Vallee, Inc. (Vallee), to present the findings of environmental conditions encountered during a recent subsurface site investigation at P.J.'s Market, located on Route 100 in Morrisville, Lamoille County, Vermont (SITE) (see SITE Location Map, Figure 1, and SITE Plan, Figure 2). The investigation was initiated in response to conditions encountered during a product line and pump island closure assessment conducted at the SITE in November 1997. All work was conducted in accordance with the State of Vermont Site Investigation Guidelines. The activities conducted were proposed in a May 27, 1998 work scope, and approved by Mr. Bob Butler of the State of Vermont, Sites Management Section (SMS) on June 30, 1998.

2.0 BACKGROUND

In the fall of 1997 the diesel fuel storage and dispensing system at the SITE was upgraded. Upgrades included the following:

- installation of one (1) 10,000 gallon capacity diesel underground storage tank (UST);
- construction of a new pump island and canopy;
- installation of a new diesel pumping system that includes satellite dispensers;
- demolition of the former gasoline and diesel fuel pump island; and,
- the in place closure of the diesel product lines leading from the former diesel tank to the former pump island.

TSEC was not notified of the line closure and pump island demolition schedule; therefore, SITE activities proceeded without oversight or a proper closure assessment. TSEC became aware of the completion of demolition activities on November 19, 1998. The exact closure date is unknown.

Immediately following notification by Vallee, TSEC conducted a soil boring program at the SITE to determine the condition of the subsurface in the immediate vicinity of the former pump island and product lines. A total of four (4) soil borings were advanced to depths ranging from 4.0 to 8.0 ft below ground surface (bgs). Collected soil samples were field screened for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID). PID readings ranged from 6.1 parts per million volume (ppmv) in sample B-3, 2.0-3.5 ft below ground surface (bgs); to 67.0 ppmv in sample B-1, 0-2 ft bgs. Groundwater was not encountered in any of the borings completed.

A report entitled "Dispenser Island Demolition and Piping Closure Assessment Report - February 9, 1998", prepared by TSEC and submitted to the State of Vermont UST Program, detailed the findings of the closure assessment. Based on the limited degree and extent of contamination discovered during the line closure assessment and the lack of threatened receptors, TSEC recommended that no additional investigation take place.

Following a review of the closure assessment report, the SMS requested that Vallee conduct a SITE assessment to: further define the degree and extent of petroleum contamination to soil; to determine the impact to groundwater; to assess the potential for contaminant impact to sensitive receptors; to determine the need for a long term monitoring program; and, to prepare a summary report detailing the findings of field activities. A copy of the SMS request dated May 8, 1998 is presented as **Attachment 1**.

3.0 SCOPE OF SERVICES

The following scope of services, intended to satisfy the requirements of the May 8, 1998 request, was performed for this investigation:

- A health and safety plan (HASP) was prepared that conforms to OSHA 40 CFR 1910.120.
- DIG SAFE was notified and requested to provide a SITE utility markout.
- Five (5) soil borings were advanced using Geoprobe[®] drilling techniques to investigate the degree and extent of soil and groundwater contamination resulting from the former piping and dispenser island. Recovered soil samples were field screened for the presence of VOCs using a ThermoEnvironmental Instruments PID equipped with a 10.6 eV lamp.
- Four (4) groundwater monitoring wells were installed into the above mentioned borings. The wells were developed in accordance with TSEC's standard operating procedures.
- Groundwater samples were collected from the four (4) newly installed monitoring wells, and submitted for analysis at Endyne, Inc. of Williston, Vermont by US EPA Method 8021B for VOCs and by US EPA Method 8100M for total petroleum hydrocarbons (TPH) as fuel oil.
- Elevations and locations of the newly installed monitoring wells and soil borings, and existing SITE features were surveyed. The data obtained was used to create a site plan (**Figure 2**), and a groundwater contour plan (**Figure 3**).
- A survey of sensitive receptors was conducted, focusing primarily on surface water bodies, subsurface utilities, basements of adjacent buildings, private drinking water wells, and air quality.
- A summary report of the above-mentioned work was prepared.

4.0 SITE LOCATION AND DESCRIPTION

SITE Owner: R.L. Vallee, Inc.
280 South Main Street
P.O. Box 192
St. Albans, VT 05478

SITE Address: P.J.'s Market
Route 100
RR 2 Box 6950
Morrisville, Vermont 05672

Lot Size: 1.0± acres (47,500 ft²)

Latitude: 44° 33' 27.25" North

Longitude: 72° 36' 31.17" West

Zoning: Commercial

Utilities: Water – Municipal Supply Connection from Route 100
Sewer – Municipal Connection to Route 100
Electric - Overhead connection
Telephone - Overhead connection

Structures: One (1) single story gasoline service station and convenience store building. Four (4) petroleum USTs are present on the western portion of the property, and one (1) kerosene aboveground storage tank (AST) located adjacent to the northwest building corner.

The SITE is located on the south side of Route 100 on the south side of Morrisville, Vermont (see SITE Location Map, Figure 1). The building on-SITE is currently in use as a retail gasoline station and convenience store. The current petroleum storage tanks for the SITE are located in the west side of the SITE building. These consist of one (1) 10,000 gallon capacity diesel UST, one (1) 3,000 gallon capacity diesel UST, one (1) 4,000 gallon capacity regular unleaded gasoline UST, and one (1) 4,000 gallon capacity super grade gasoline UST. The AST for kerosene is a 500 gallon steel tank with secondary containment, and is located adjacent to the northwest corner of the store.

The SITE is commercially zoned and is situated in a mixed land use area. The properties adjacent to the SITE consist of a commercial lot and self storage facility across Route 100 to the north, a private residence to the west, a commercial waste hauling company to the south, and a commercial building to the east.

The topography of the SITE and immediate vicinity is relatively flat. The nearest potential sensitive receptor identified during this investigation is a surface water drainage feature located along the western SITE boundary. This feature flows to the north and west and ultimately flows into Ryder Brook. Ryder Brook empties into Lake Lamoille, approximately ½-mile to the north of the SITE. An unnamed surface water feature is located approximately 500 ft to the east of the SITE, also flowing into Lake Lamoille (see Figure 1, SITE Location Map, and Figure 2, SITE Plan).

5.0 SUBSURFACE EXPLORATION AND RESULTS

The subsurface exploration program was developed to gather data to provide a better understanding of the hydrogeology and contaminant distribution on SITE.

5.1 Advancement of Soil Borings

Five (5) soil borings were advanced by TSEC on July 9, 1998 at locations indicated on Figure 2. Logs for these borings are presented in Appendix A. These borings were advanced to depths ranging from 12.0 to 16.0 ft bgs. All borings were logged, describing soil strata conditions, and field analyzed with a PID using conventional headspace techniques.

Groundwater flow direction, based on area features and topography, was presumed to flow toward the northwest. Based on this assumption, borings were advanced using Geoprobe® direct push technology at the following locations:

- Soil Boring B-1 was advanced between the SITE building and the existing USTs, in order to characterize SITE conditions adjacent to the contamination source area. This boring was completed as monitoring well MW-1.
- Soil Boring B-2 was advanced in the center of the suspected source area. This boring was completed as monitoring well MW-2.
- Soil Boring B-3 was advanced to the north of the former pump island and product lines. This boring was backfilled with drill cuttings, bentonite, and sand to grade.
- Soil Boring B-4 was advanced to the northwest of the former pump island and product lines. This boring was completed as monitoring well MW-3.
- Soil Boring B-5 was advanced to the southwest of the former pump island and product lines. This boring was completed as monitoring well MW-4.

Boring depths ranged from 12.0 ft bgs to 16.0 ft bgs. General soil conditions encountered at the SITE consisted of a medium and coarse sand from the surface to a depth of approximately 12.0 ft bgs, overlying a 1.0 ft thick silty fine sand layer, followed by a coarse sand and gravel layer. Some borings exhibited a tight silty layer at approximately 13.0 to 15.0 ft bgs. Groundwater was encountered between 9.36 and 11.35 ft bgs in borings B-5/MW-4 and B-1/MW-1, respectively.

Contaminated soil was encountered during the advancement of soil boring B-2, with the highest concentrations of VOCs present between 4.0 and 8.0 ft bgs. Boring B-2 is located proximate to the former pump island and product lines. A headspace analysis performed on the samples collected from this boring indicated VOCs present at concentrations ranging from <0.1 ppmv (8-12 and 12-16 ft bgs)

to 0.4 ppmv (4-8 ft bgs). There were no visual or olfactory indications of petroleum contamination in the sample from 4-8 bgs, suggesting that the reading could have been caused by moisture in the sample.

PID readings in borings B-1, B-3, B-4, and B-5 were all <0.1 ppmv. Further description of subsurface materials and contaminant distribution can be found in **Appendix A, Boring Logs**.

5.2 Monitoring Well Installation and Construction

Monitoring wells were constructed of 1½ x ½-inch diameter schedule 40 polyvinylchloride (PVC) pre-packed monitoring wells with 0.010-inch machine slotted screen. These pre-packed monitoring wells consist of a ½-inch diameter inner screen surrounded by a clean sand filter pack, placed inside a 1½-inch diameter outer screen, and a ½-inch diameter schedule 40 PVC riser. A bentonite seal was placed above the screened section to prevent infiltration of surface water into the formation

Wells were completed with a flush-mounted, watertight curb box that was set in concrete, and fitted with an expansion plug to avoid surface infiltration to the aquifer. Wells were installed to depths ranging from 11.20 ft bgs (MW-4) to 14.25 ft bgs (MW-1).

Fine particulates introduced into the formation during drilling and/or installation were removed by developing the new wells. In addition, well development was performed to hydraulically connect the aquifer and the well, allowing for more accurate determination of *in situ* conditions (i.e. water level, aquifer parameters, and chemical constituents).

5.3 SITE Geology

A summary of the predominant geological units encountered during drilling activities indicated that the materials beneath the SITE consist of a medium sand overlying a silty fine sand, followed by a medium to coarse sand. For a more detailed description of geological units, see Boring Logs in **Appendix A**.

According to published data¹, surficial geologic materials that underlie the SITE consist of littoral sediments, predominantly pebbly sands. Reports available concerning the bedrock materials underlying the SITE, indicate the presence of an "interbedded pale silver-gray to green schist with local phyllites."²

5.4 SITE Survey

A Topcon AT-G6 auto level was used to perform a stadia survey to identify the location and elevation of the newly installed monitoring wells and soil borings with respect to existing site features. The collected data was used to create the SITE Plan (**Figure 2**) which includes the location of the newly

¹ Doll, C.G., editor, 1970, Surficial Geologic Map of Vermont, VT Geological Survey, SGL.

² Wright, F.M., 1974, Geology for Environmental Planning in the Johnson-Hardwick Region, Vermont, Water Resources Div., Env. Geol. no. 4, 60 pgs.

installed wells and sampling points. A fire hydrant, located at the northwestern corner of the SITE, was used as a temporary benchmark and given an elevation of 100.00 ft.

6.0 COLLECTION OF GROUNDWATER SAMPLES

Groundwater samples were collected by TSEC on July 21, 1998, twelve (12) days after monitoring well installations were completed. Samples were collected from the newly installed wells MW-1, MW-2, MW-3 and MW-4.

Prior to sampling, depth to groundwater was measured at all monitoring wells. Depth to water measurements ranged from 9.36 ft below top of casing (btoc) to 11.35 ft btoc at monitoring wells MW-4 and MW-1, respectively.

To allow for a representative groundwater sample, each well was purged of at least three (3) volumes of water with a new bailer or a peristaltic pump. Purge water from the wells was discharged directly to the ground surface. Samples at each monitoring well were collected using the bailer which was dedicated to the well.

Quality Assurance/Quality Control (QA/QC) samples incorporated into this sampling round included one (1) duplicate sample taken from monitoring well MW-2 and one (1) field blank. Samples collected from monitoring wells were analyzed via US EPA Method 8021B for VOCs and via US EPA Method 8100M for TPH as fuel oil. Endyne Inc. of Williston, Vermont performed all chemical analyses for this round of groundwater sampling. The results of the groundwater sampling round are discussed in the following sections.

7.0 RESULTS OF SAMPLING ACTIVITIES

7.1 Groundwater Flow Direction

TSEC personnel measured groundwater levels on SITE on July 21, 1998. As previously mentioned, depth to groundwater ranged from 9.36 ft btoc to 11.35 ft btoc at wells MW-4 and MW-1, respectively. Groundwater elevation data is presented in Table 1 (Summary of Groundwater Elevations).

Based on measured depths to groundwater observed in monitoring wells at the time of sampling, groundwater underlying the SITE has been calculated to flow to the northeast. The horizontal hydraulic gradient was 0.02 ft/ft. Based on this measured hydraulic gradient (i), the published hydraulic conductivity for silty sands and gravel of 10^{-5} centimeters per second (cm/s) to 10^{-3} cm/s (k), and an assumed porosity value of 30% for this SITE (η), the apparent groundwater flow velocity can be calculated using the following equation:

$$v_{gw} = \frac{ki}{\eta}$$

The calculated groundwater velocity beneath the SITE, according to the above equation, is 10^{-5} cm/s to 10^{-7} cm/s (0.1 to 10 ft/year).

A graphical interpretation of the groundwater flow direction is presented on the Groundwater Contour Plan provided as **Figure 3**.

***Note:** This plan illustrates groundwater flow to the northeast, not to the west as originally anticipated; therefore, there is no groundwater monitoring well placed directly downgradient of the suspected source area. The monitoring well placement was based upon surface water drainage features, and SITE/area topography. Additionally, due to the placement of product lines, leak detection monitoring systems, and power supplies leading to and from the current USTs, it was not possible to advance a boring between MW-1 and B-3 without the precise identification of these features.*

7.2 Groundwater Analytical Results

Results received from Endyne indicate that no US EPA Method 8021B compounds are present above method detection limits (MDLs) in any of the groundwater samples collected. The MDLs are all well below the established Vermont Groundwater Enforcement Standards (VGES) for individual compounds.

Total petroleum hydrocarbons were detected in three (3) groundwater samples at concentrations ranging from 440 micrograms per liter ($\mu\text{g/l}$) to 630 $\mu\text{g/l}$ in the samples collected from MW 4 and MW-1, respectively. The sample collected from MW-2, which is located within the suspected source area, contained TPH as fuel oil at a concentration of 490 $\mu\text{g/l}$, and TPH was not detected above the MDL of 400 $\mu\text{g/l}$ in MW-3.

The complete analytical laboratory report from Endyne, is summarized in **Table 2**, and is provided as **Attachment 2**.

7.3 QA/QC Results

7.3.1 Field QA/QC

The Relative Percent Difference (RPD) for BTEX in the sample collected from MW-2 and its duplicate, DUP-1 could not be calculated, since no compounds were detected above MDLs. Likewise, the RPD for MTBE could not be calculated. The RPD for TPH also could not be calculated since the TPH concentration in DUP-1 was below detection limits.

BTEX and MTBE were not detected above method detection limits in the Field Blank.

7.3.2 Laboratory QA/QC

All laboratory data was evaluated for the following parameters prior to acceptance in this report:

- analysis within holding time;
- correct sample ID's;
- acceptable detection limit multipliers;
- acceptable matrix spike (MS) and matrix spike duplicate (MSD) recoveries;
- acceptable Relative Percent Difference between MS and MSD; and,
- acceptable surrogate recoveries where applicable.

8.0 RECEPTOR EVALUATION

During this investigation a sensitive receptor evaluation was conducted in the immediate vicinity. This investigation focused on surface water receptors, groundwater supply wells, and basements located downgradient.

Well records for Morrystown, Vermont were obtained and reviewed at the State of Vermont Water Supply Division offices in Waterbury, Vermont. The results of this evaluation indicated that there is one (1) groundwater supply well within ½-mile of the SITE. This supply well, owned by H.A. Manosh Corporation of Morrisville, is located approximately 2,000 ft to the southeast of the SITE, in an apparent upgradient direction.

The nearest surface water receptor identified is the drainage swale located along the western edge of the SITE. A second surface water body is located approximately 500 ft to the northeast of the SITE. Both features ultimately flow into Lake Lamoille and the Lamoille River.

Subsurface utilities within the SITE vicinity are buried at depths ranging between 4.0 and 8.0 ft bgs. Based on the conditions encountered on SITE, it does not appear likely that utility corridors will be impacted.

Finally, the only basement in the immediate vicinity of the SITE is at the residence located immediately to the west of the SITE. The homeowners were not present during SITE activities to grant access. Based on the direction of groundwater flow, the depth of groundwater, and the low levels of contamination present in groundwater, it does not appear as though the basement will likely be impacted. The SITE building and other structures in the immediate vicinity are constructed on concrete slabs situated on grade.

9.0 SUMMARY AND CONCLUSIONS

Based on the information and analytical data obtained during this investigation, TSEC concludes the following:

- The suspected source of the contamination, the former pump island and diesel product piping, has been removed from service. The pump island has been removed from the SITE, and the diesel product piping has been closed in place.
- No human receptors in the immediate vicinity appear to be at risk from the contamination on SITE.
- No target compounds were detected in groundwater samples collected from on SITE monitoring wells that exceed VGES.
- Soil and groundwater beneath the SITE has not been significantly impacted by a release of petroleum to the subsurface.

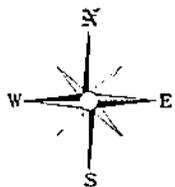
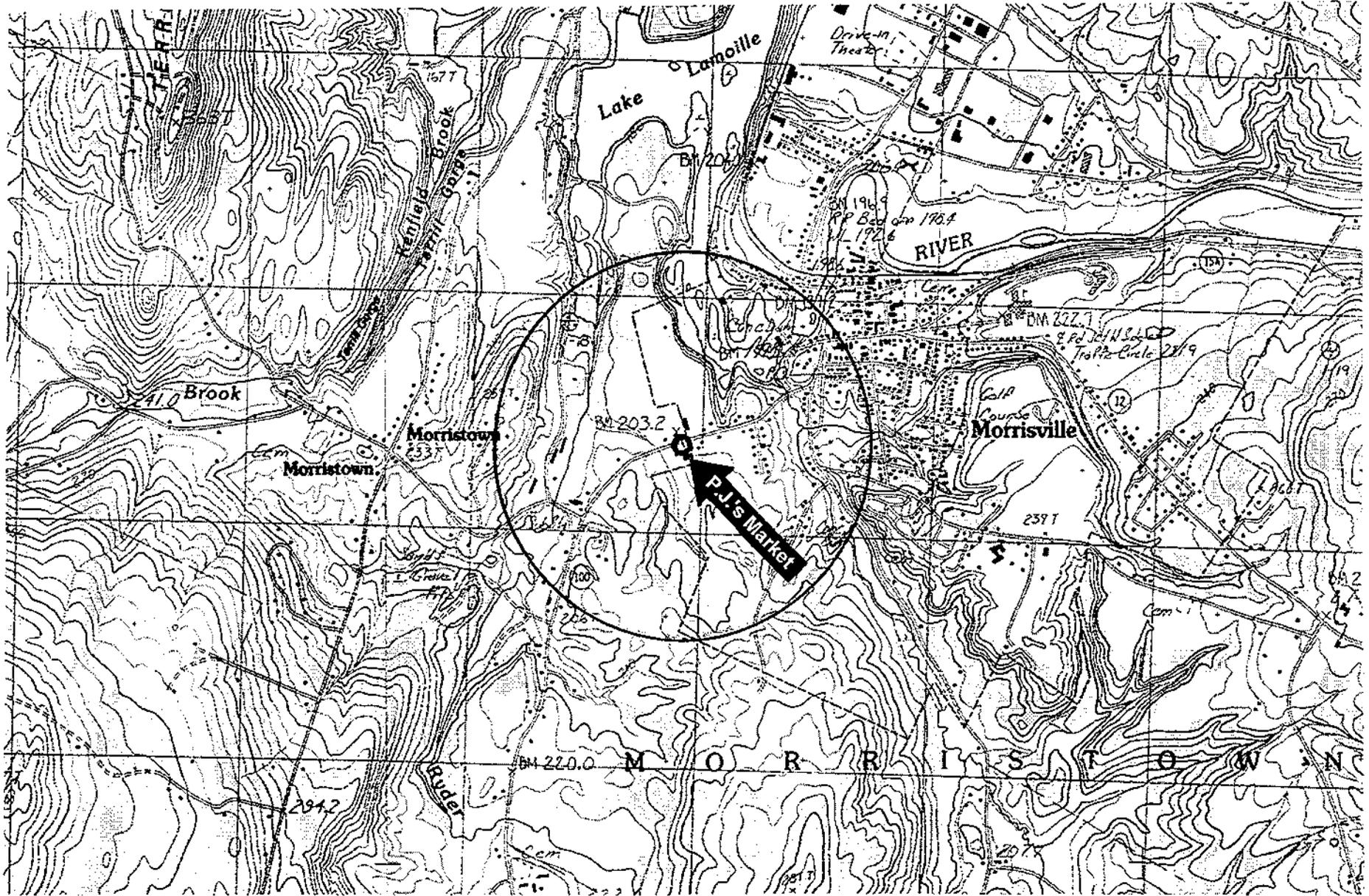
10.0 RECOMMENDATIONS

Based on the data obtained to date, TSEC offers the following recommendations:

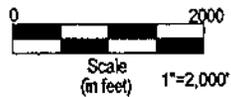
- One (1) additional groundwater monitoring well should be installed adjacent to the northwest corner of the store building, approximately 30 ft to the north of MW-1.
- One (1) additional groundwater-monitoring event should be conducted at the SITE. Samples should be analyzed for VOCs via US EPA Method 8021B and for TPH as fuel oil via US EPA Method 8100M.
- The air quality of the basement of the adjacent residence should be field screened for the presence of VOCs with a PID during the next sampling event.

If the analytical results of this sampling event are similar to the findings of the July 1998 sampling, the SITE should be considered for a Sites Management Activity Completed (SMAC) designation.

FIGURES



Source: USGS 7.5 Minute Topographic Series
Morrisville and Whiteface Mtn., Vermont Quadrangles



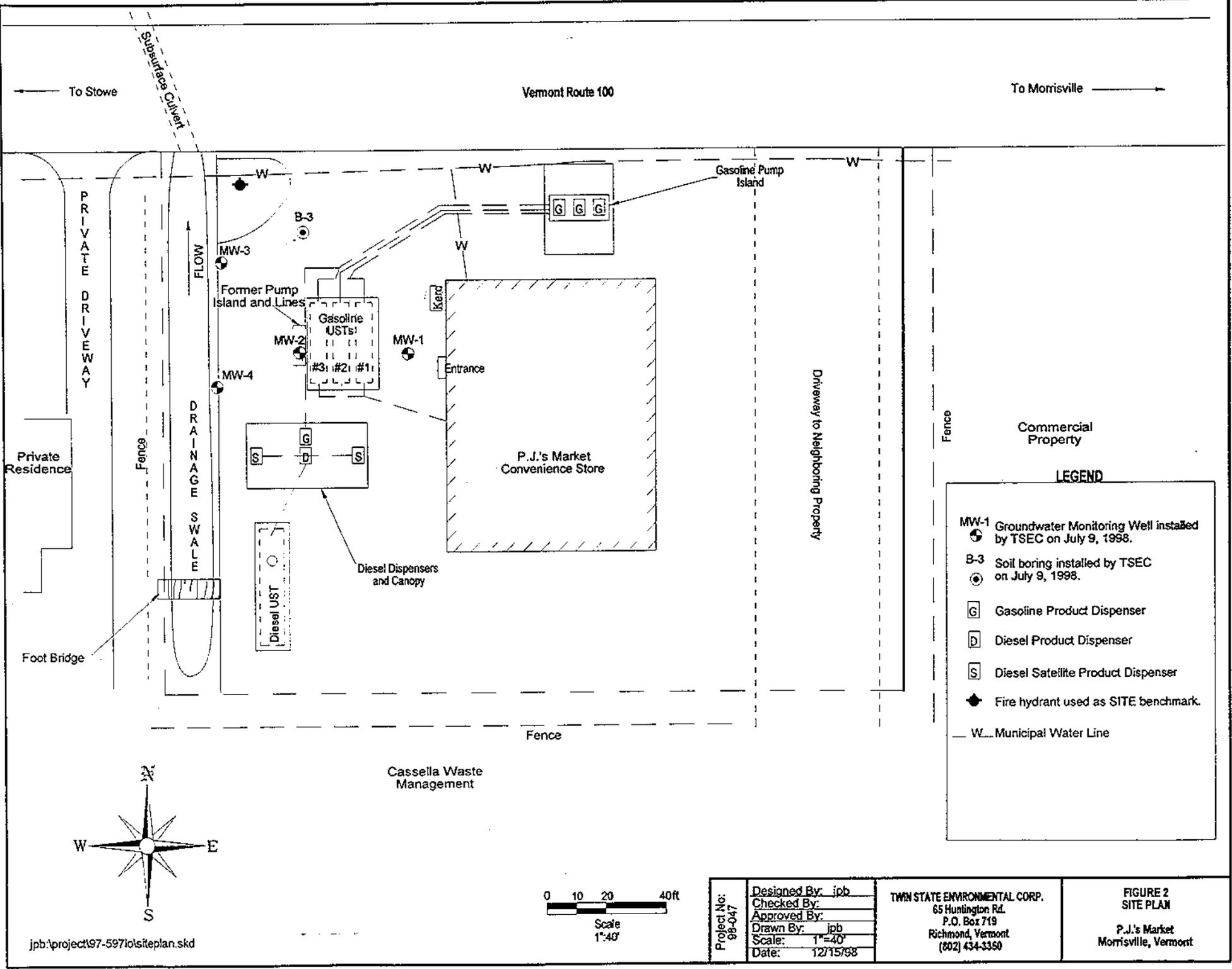
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98-047

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Approved By:	
Drawn By:	job
Scale:	as shown
Date:	12/16/98

TWIN STATE ENVIRONMENTAL CORP.
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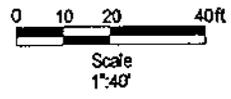
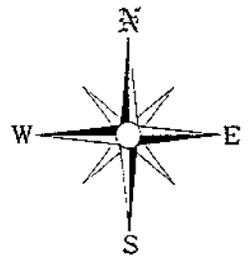
FIGURE 1
SITE LOCATION MAP

P.J.'s Market
Morrisville, Vermont



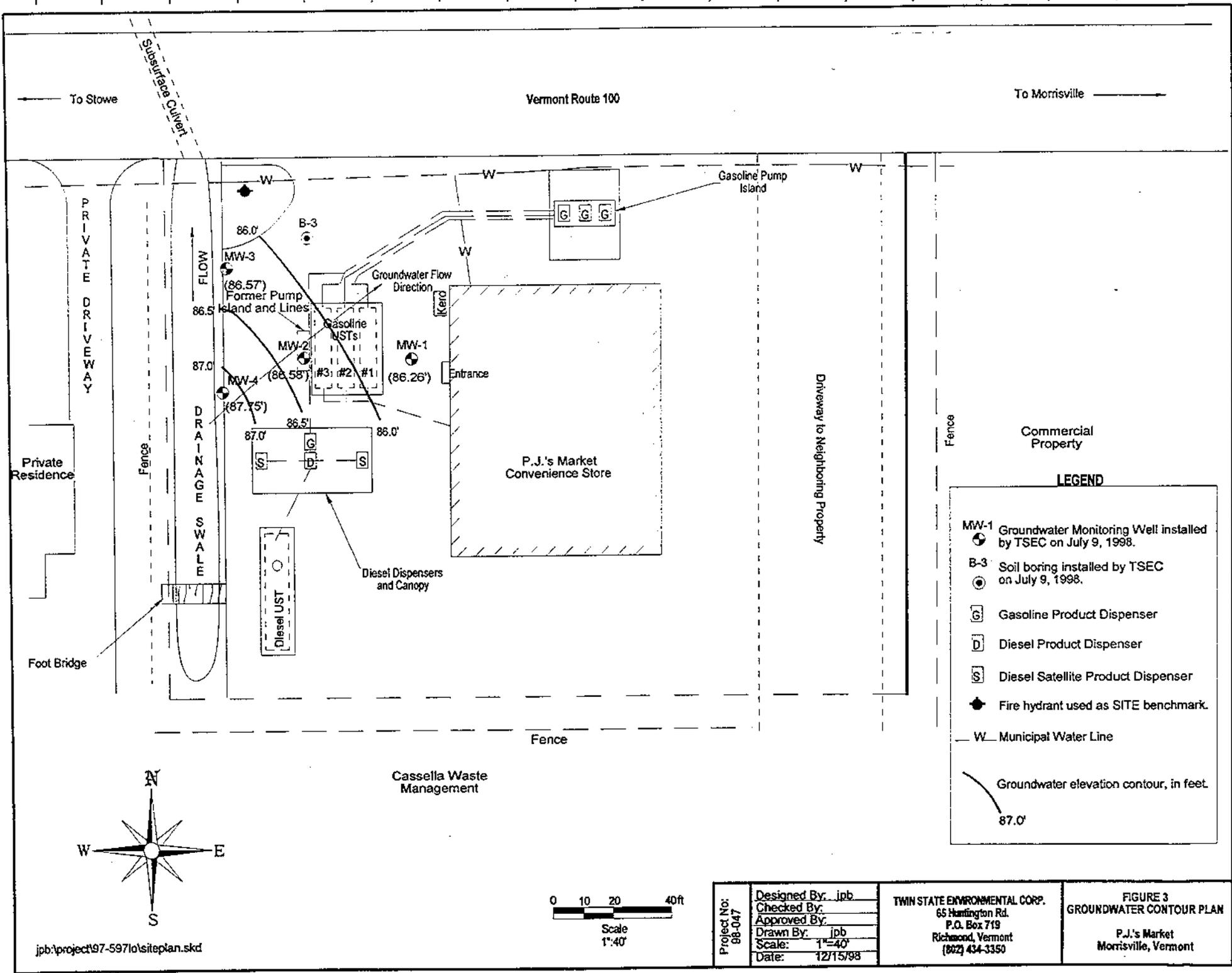
LEGEND

- MW-1 Groundwater Monitoring Well installed by TSEC on July 9, 1998.
- B-3 Soil boring installed by TSEC on July 9, 1998.
- Gasoline Product Dispenser
- Diesel Product Dispenser
- Diesel Satellite Product Dispenser
- Fire hydrant used as SITE benchmark.
- Municipal Water Line



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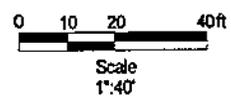
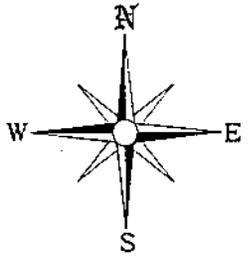
Project No: 98-047	Designed By: jpb	TWIN STATE ENVIRONMENTAL CORP. 65 Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 2 SITE PLAN P.J.'s Market Morrisville, Vermont
	Checked By:		
	Approved By:		
	Drawn By: jpb		
	Date: 12/15/98		



Commercial Property

LEGEND

- MW-1 Groundwater Monitoring Well installed by TSEC on July 9, 1998.
- B-3 Soil boring installed by TSEC on July 9, 1998.
- G Gasoline Product Dispenser
- D Diesel Product Dispenser
- S Diesel Satellite Product Dispenser
- Fire hydrant used as SITE benchmark.
- W Municipal Water Line
- Groundwater elevation contour, in feet.



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Project No: 98-047	Designed By: jpb
	Checked By:
	Approved By:
	Drawn By: jpb
	Date: 12/15/98

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FIGURE 3
GROUNDWATER CONTOUR PLAN

P.J.'s Market
Morrisville, Vermont

TABLES

TABLE 1

P.J.'s MARKET
MORRISVILLE, VERMONT
SMS SITE #88-0235

Summary of Groundwater Elevations

July 21, 1998

Well Identification	Top of Riser Elevation	Depth to Product	Depth to Water	Depth of Well	Thickness of Water in Well	Water Table Elev.
MW-1	97.61	ND	11.35	14.25	2.90	86.26
MW-2	97.45	ND	10.87	13.75	2.88	86.58
MW-3	96.91	ND	10.34	12.30	1.96	86.57
MW-4	97.11	ND	9.36	11.20	1.84	87.75

- Notes:
1. Elevation data is referenced to a TBM. Units are in feet.
 2. ND - not detected.
 3. NA - not applicable.
 4. Measurements recorded are referenced to a marking on top of PVC riser for each well.
 5. Depth to fluid measurements were obtained using a Solinst Interface Probe.

jp:\project\98-047\report tables.xls\water table elevations

TABLE 2

P.J.'s MARKET
MORRISVILLE, VERMONT
SMS SITE #88-0235

Summary of Groundwater Quality

July 21, 1998

Sample ID	VGES	MW-1	MW-2	MW-3	MW-4	FB	DUP-1
Compound	Concentration (µg/l)						
Benzene	5.0	<1	<1	<1	<1	<1	<1
Toluene	1,000	<1	<1	<1	<1	<1	<1
Ethylbenzene	700	<1	<1	<1	<1	<1	<1
Total Xylenes	10,000	<1	<1	<1	<1	<1	<1
Total BTEX	ne	-	-	-	-	-	-
1,3,5-Trimethylbenzene	4.0	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	5.0	<1	<1	<1	<1	<1	<1
Naphthalene	20	<1	<1	<1	<1	<1	<1
MTBE	40	<10	<10	<10	<10	<10	<10
TPH as Fuel Oil	ne	630	490	<400	440	<400	<400

- Notes:
1. VGES - Vermont Groundwater Enforcement Standard.
 2. ne - VGES not established for compound.
 3. ***Bold and Italic*** numbers indicate concentrations that exceed VGES.
 4. DUP-1 - Duplicate sample of monitoring well MW-2. Collected for Quality Assurance/Quality Control.
 5. All monitoring well samples were analyzed via US EPA Method 8021B.
 6. TPH values are based upon the response of a #2 fuel oil standard. Analyses performed via US EPA Method 8100M.

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APPENDIX A



TWIN STATE ENVIRONMENTAL CORPORATION

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-1 / MW-1	WELL DEPTH:	14.3 ft bgs	BORING DEPTH:	16.0 feet
PROJECT NAME:	P.J.'s Market	DEPTH TO WATER:	11.35 ft bgs on 07/21/98.		
PROJECT NO:	98-047	SCREEN DIA:	1 1/2 x 1/2-inch	DEPTH:	4.3-14.3 ft bgs
INSTALL DATE:	July 9, 1998	SCREEN TYPE/SIZE:	0.010-slot schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA:	1/2-inch	DEPTH:	0.5-4.3 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mount road box set in concrete.		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Locking expansion plug.		
REMARKS:	Boring was completed as a groundwater monitoring well.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0		0-4	<0.1	3.5 ft recovery	0.0-0.5: ASPHALT and GRAVEL base. 0.5-0.9: Silty SAND and GRAVEL fill material. 0.9-2.5: Fine SAND with trace of silt. Lt. brown, dry. 2.5-3.5: Fine and medium SAND. Tan, dry.	CEMENT GROUT NATIVE BACKFILL	
1							
2							
3							
4			4-8	<0.1	3.0 ft recovery	4.0-5.0: Medium and coarse SAND. Tan/lt brown, dry. 5.0-5.5: Medium and coarse SAND and GRAVEL. Tan, dry. 5.5-6.5: Medium SAND, grading to fine SAND. Tan, damp. 6.5-7.0: Tight SILT. Tan/Gray, damp.	BENTONITE SEAL SAND PACK
5							
6							
7							
8			8-12	<0.1	4.0 ft recovery	8.0-9.5: Silty very fine SAND. Damp, tan. 9.5-9.7: Fine SAND. Damp, tan. 9.7-12.0: Silty very fine SAND. Tan, saturated at 11.5 ft bgs.	WELL SCREEN RISER PIPE
9							
10							
11		▼					
12			12-16	<0.1	4.0 ft recovery	12.0-13.0: Silty fine and very fine SAND. Saturated, tan/gray. 13.0-16.0: SILT. Saturated, loose, gray.	HS HEAD SPACE ▼ WATER LEVEL (APPROXIMATE)
13							
14							
15							
16					End of Sampling = 16.0 feet End of Boring = 16.0 feet		
17							
18							
19							
20							
21							
22							
23							
24							
25							

GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE	0-10%
0-4	V.LOOSE	<2	V.SOFT	LITTLE	10-20%
4-10	LOOSE	2-4	SOFT	SOME	20-35%
10-30	M.DENSE	4-8	M.STIFF	AND	35-50%
30-50	DENSE	8-15	STIFF		
>50	V.DENSE	15-30	V.STIFF		
		>30	HARD		

NOTES:	1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
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TWIN STATE ENVIRONMENTAL CORPORATION

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO: B-2 / MW-2	WELL DEPTH: 13.8 ft bgs BORING DEPTH: 16.0 feet
PROJECT NAME: P.J.'s Market	DEPTH TO WATER: 10.87 ft bgs on 07/21/98.
PROJECT NO: 98-047	SCREEN DIA: 1½x½-inch DEPTH: 3.8-13.8 ft bgs
INSTALL DATE: July 9, 1998	SCREEN TYPE/SIZE: 0.010-slot schedule 40 PVC
TSEC REP: Jon Berntsen	RISER TYPE: schedule 40 PVC
DRILLING CO: TSEC	RISER DIA.: ½-inch DEPTH: 0.5-3.8 ft bgs
DRILLING METHOD: Geoprobe®	GUARD TYPE: Flush mount road box set in concrete.
SAMPLING METHOD: Macrocore Sampler	RISER CAP: Locking expansion plug.
REMARKS: Boring was completed as a groundwater monitoring well.	

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0		0-4	0.2	2.0 ft recovery	<u>0.0-0.5:</u> ASPHALT and GRAVEL base. <u>0.5-2.0:</u> Silty fine SAND with trace of gravel. Lt. brown, dry.	 HS HEAD SPACE WATER LEVEL (APPROXIMATE)
1						
2						
3						
4			4-8	0.4	2.0 ft recovery	<u>4.0-4.5:</u> Silty SAND. Tan/lt. brown, dry. <u>4.5-6.0:</u> Medium SAND. Tan/brown, dry.
5						
6						
7						
8			8-12	<0.1	2.1 ft recovery	<u>8.0-8.9:</u> Medium SAND. Damp, tan. <u>8.9-9.5:</u> Fine and medium SAND with trace of gravel. Damp, tan. <u>9.5-10.0:</u> Medium SAND. Tan, damp. <u>10.0-10.1:</u> Wet SILT.
9						
10						
11						
12			12-16	<0.1	3.0 ft recovery	<u>12.0-12.5:</u> Medium SAND (cave in). <u>12.5-14.0:</u> Silty fine and very fine SAND. Saturated. <u>14.0-14.2:</u> Coarse SAND and GRAVEL. <u>14.2-15.0:</u> Tight SILT. Damp.
13						
14						
15						
16					End of Sampling = 16.0 feet End of Boring = 16.0 feet	
17						
18						
19						
20						
21						
22						
23						
24						
25						

GRANULAR SOILS BLOWS/FT DENSITY 0-4 V.LOOSE 4-10 LOOSE 10-30 M.DENSE 30-50 DENSE >50 V.DENSE	COHESIVE SOILS BLOWS/FT DENSITY <2 V.SOFT 2-4 SOFT 4-8 M.STIFF 8-15 STIFF 15-30 V.STIFF >30 HARD	PROPORTIONS USED TRACE 0-10% LITTLE 10-20% SOME 20-35% AND 35-50%	NOTES: <ol style="list-style-type: none"> See Figure 2, SITE Plan, for boring locations PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
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TWIN STATE ENVIRONMENTAL CORPORATION

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-3	WELL DEPTH:	N/A	BORING DEPTH:	12.0 feet
PROJECT NAME:	P.J.'s Market	DEPTH TO WATER:	N/A		
PROJECT NO:	98-047	SCREEN DIA:	N/A	DEPTH:	N/A
INSTALL DATE:	July 9, 1998	SCREEN TYPE/SIZE:	M/A		
TSEC REP:	Jon Berntsen	RISER TYPE:	N/A		
DRILLING CO:	TSEC	RISER DIA.:	N/A	DEPTH:	N/A
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	N/A		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	N/A		
REMARKS:	Boring was backfilled with bentonite and cuttings.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0	N	0-4	<0.1	3.0 ft recovery	0.0-0.5: ASPHALT and GRAVEL base.	CEMENT GROUT	
1	O				0.5-3.0: Silty fine SAND with trace of gravel. Lt. brown, dry.	NATIVE BACKFILL	
2						BENTONITE SEAL	
3	W					SAND PACK	
4	E	4-8	<0.1	1.5 ft recovery	4.0-5.5: Medium SAND. Tan, dry.	WELL SCREEN	
5	L					RISER PIPE	
6	L					HS HEAD SPACE	
7						WATER LEVEL (APPROXIMATE)	
8	I	8-12	<0.1	2.0 ft recovery	8.0-8.5: Medium SAND. Tan, dry.		
9	N				8.5-9.1: Fine silty SAND. Dry, brown.		
10	S				9.1-9.8: Medium SAND. Tan, damp.		
11	T				9.8-10.0: Wet SILT.		
12	A				End of Sampling = 12.0 feet		
13	L				End of Boring = 12.0 feet		
14	L						
15	E						
16	D						
17							
18							
19							
20							
21							
22							
23							
24							
25							
GRANULAR SOILS BLOWS/FT DENSITY 0-4 V.LOOSE 4-10 LOOSE 10-30 M.DENSE 30-50 DENSE >50 V.DENSE		COHESIVE SOILS BLOWS/FT DENSITY <2 V.SOFT 2-4 SOFT 4-8 M.STIFF 8-15 STIFF 15-30 V.STIFF >30 HARD		PROPORTIONS USED TRACE 0-10% LITTLE 10-20% SOME 20-35% AND 35-50%		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	



TWIN STATE ENVIRONMENTAL CORPORATION

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-4 / MW-3	WELL DEPTH:	12.3 ft bgs	BORING DEPTH:	16.0 feet
PROJECT NAME:	P.J.'s Market	DEPTH TO WATER:	10.34 ft bgs on 07/21/98.		
PROJECT NO:	98-047	SCREEN DIA:	1 1/2 x 1/2 -inch	DEPTH:	2.3-12.3 ft bgs
INSTALL DATE:	July 9, 1998	SCREEN TYPE/SIZE:	0.010-slot schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA:	4-inch	DEPTH:	0.5-2.3 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mount road box set in concrete.		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Locking expansion plug.		
REMARKS:	Boring was completed as a groundwater monitoring well.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND																								
0		0-4	<0.1	3.0 ft recovery	0.0-1.0: Silty fine SAND. Tan. 1.0-3.0: Medium SAND. Saturated, tan.																									
1																														
2																														
3																														
4			4-8	<0.1	4.0 ft recovery		4.0-5.0: Medium SAND w/SILT. 5.0-6.0: Medium SAND. 6.0-7.0: SILT and very coarse SAND. 7.0-7.8: Medium SAND. 7.8-8.0: SILT and very fine SAND.																							
5																														
6																														
7																														
8			8-12	<0.1	4.0 ft recovery		8.0-9.5: Medium SAND. Damp, tan. 9.5-10.5: Wet SILT. 10.5-11.0: Medium SAND 11.0-11.2: Medium SAND and SILT. Tan, damp.																							
9																														
10																														
11																														
12			12-16	<0.1	4.0 ft recovery		11.2-12.0: SILT and very fine SAND. 12.0-16.0: Silty fine to medium SAND. Saturated, tan.																							
13																														
14																														
15																														
16																														
17																														
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<table border="0" style="width: 100%; font-size: small;"> <tr> <td style="width: 33%;">GRANULAR SOILS</td> <td style="width: 33%;">COHESIVE SOILS</td> <td style="width: 33%;">PROPORTIONS USED</td> </tr> <tr> <td>BLOWS/FT DENSITY</td> <td>BLOWS/FT DENSITY</td> <td>TRACE 0-10%</td> </tr> <tr> <td>0-4 V.LOOSE</td> <td><2 V.SOFT</td> <td>LITTLE 10-20%</td> </tr> <tr> <td>4-10 LOOSE</td> <td>2-4 SOFT</td> <td>SOME 20-35%</td> </tr> <tr> <td>10-30 M.DENSE</td> <td>4-8 M.STIFF</td> <td>AND 35-50%</td> </tr> <tr> <td>30-50 DENSE</td> <td>8-15 STIFF</td> <td></td> </tr> <tr> <td>>50 V.DENSE</td> <td>15-30 V.STIFF</td> <td></td> </tr> <tr> <td></td> <td>>30 HARD</td> <td></td> </tr> </table>					GRANULAR SOILS	COHESIVE SOILS	PROPORTIONS USED	BLOWS/FT DENSITY	BLOWS/FT DENSITY	TRACE 0-10%	0-4 V.LOOSE	<2 V.SOFT	LITTLE 10-20%	4-10 LOOSE	2-4 SOFT	SOME 20-35%	10-30 M.DENSE	4-8 M.STIFF	AND 35-50%	30-50 DENSE	8-15 STIFF		>50 V.DENSE	15-30 V.STIFF			>30 HARD		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
GRANULAR SOILS	COHESIVE SOILS	PROPORTIONS USED																												
BLOWS/FT DENSITY	BLOWS/FT DENSITY	TRACE 0-10%																												
0-4 V.LOOSE	<2 V.SOFT	LITTLE 10-20%																												
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>50 V.DENSE	15-30 V.STIFF																													
	>30 HARD																													



TWIN STATE ENVIRONMENTAL CORPORATION

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477
(802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-5 / MW-4	WELL DEPTH:	11.2 ft bgs	BORING DEPTH:	16.0 feet
PROJECT NAME:	P.J.'s Market	DEPTH TO WATER:	9.36 ft bgs on 07/21/98.		
PROJECT NO:	98-047	SCREEN DIA:	1½x½-inch	DEPTH:	1.2-11.2 ft bgs
INSTALL DATE:	July 9, 1998	SCREEN TYPE/SIZE:	0.010-slot schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	½-inch	DEPTH:	0.5-1.2 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mount road box set in concrete.		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Locking expansion plug.		
REMARKS:	Boring was completed as a groundwater monitoring well.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0		0-4	<0.1	2.0 ft recovery	<u>0.0-1.0:</u> ASPHALT and GRAVEL base. <u>1.0-2.0:</u> Medium SAND. Damp, tan.	CEMENT GROUT NATIVE BACKFILL BENTONITE SEAL SAND PACK WELL SCREEN RISER PIPE HS HEAD SPACE WATER LEVEL (APPROXIMATE)	
1							
2							
3							
4			4-8	<0.1	3.5 ft recovery	<u>4.0-6.0:</u> Medium SAND. <u>6.0-6.5:</u> Silty fine SAND. Tan, saturated <u>6.5-6.6:</u> Medium SAND. <u>6.6-7.5:</u> Silty fine and very fine SAND.	
5							
6							
7							
8			8-12	<0.1	4.0 ft recovery	<u>8.0-9.5:</u> Medium SAND. Damp, tan. <u>9.5-10.2:</u> Wet SILT. <u>10.2-11.0:</u> Medium SAND <u>11.0-11.5:</u> Medium SAND and SILT. Tan, damp. <u>11.5-12.0:</u> SILT and very fine SAND.	
9							
10							
11							
12			12-16	<0.1	4.0 ft recovery	<u>12.0-16.0:</u> Silty fine to medium running SAND. Saturated, tan.	
13							
14							
15							
16					End of Sampling = 16.0 feet End of Boring = 16.0 feet		
17							
18							
19							
20							
21							
22							
23							
24							
25							
GRANULAR SOILS BLOWS/FT DENSITY 0-4 V.LOOSE 4-10 LOOSE 10-30 M.DENSE 30-50 DENSE >50 V.DENSE		COHESIVE SOILS BLOWS/FT DENSITY <2 V.SOFT 2-4 SOFT 4-8 M.STIFF 8-15 STIFF 15-30 V.STIFF >30 HARD		PROPORTIONS USED TRACE 0-10% LITTLE 10-20% SOME 20-35% AND 35-50%		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	

ATTACHMENT 1



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Waste Management Division
103 South Main Street/West Office
Waterbury, Vermont 05671-0404
(802) 241-3888
FAX (802) 241-3296

May 8, 1998

Mr. Jim Driver
R. L. Vallee, Inc.
282 South Main Street
St. Albans, Vermont 05478

RE: Petroleum Contamination at P.J. Market
Morrisville, Vermont
SMS Site # 88-0235

Dear Mr. Driver:

The Sites Management Section (SMS) has received the Underground Storage Tank (UST) closure report which outlines the subsurface conditions for the above referenced site. The fieldwork was conducted by Twin State Environmental on November 19, 1997. The report is dated February 9, 1998 and summarizes the degree and extent of contamination encountered. This report is 79 days later than the required deadline of 3 days. This is unacceptable.

The UST piping closed was associated with:

- UST #2 - 4,000 gallon diesel UST

During the site activities, screened soils had concentrations up to 67 parts per million (ppm) as measured by a photoionization detector (PID). The peak PID readings were measured at depths of 2 to 8 feet below ground surface (fbgs) in the borings. The limits of soil contamination were reported as defined but the basal PID measurement in boring B-1 was 11.0 ppmv.

Site soils consisted of primarily medium sand and gravel. Groundwater was not encountered at a (maximum) depth of approximately 8 fbgs.

The P.J. Market was inspected for sensitive receptors. The possible receptors potentially affected include groundwater, basements of adjacent buildings, and soil.

Based on the report information, the SMS has determined additional work is necessary to determine the severity of contamination. Due to possible contamination to nearby receptors, the SMS requests that R. L. Vallee, Inc. retain the services of a qualified environmental consultant to perform the following:

- Further define the degree and extent of contamination to the soil.
- Determine the degree and extent of contamination, if any, to groundwater. A sufficient number of monitoring sites should be installed to adequately define the severity of site contamination. Analyze groundwater samples for BTEX and TPH. At sites proximal to water supply sources, determine the hydrologic relationship of the contaminated area to the water supply source. Pumping influences should be considered in the evaluation.
- Assess the potential for contaminant impact on sensitive receptors. Base this update on all available information and include basements of adjacent buildings; nearby surface water, any proximal drinking

water sources, wetlands, sensitive ecologic areas, outdoor or indoor air, sewers, or utility corridors. Sample and analyze any at-risk water supplies for BTEX and TPH compounds.

- Determine the need for long-term treatment and/or monitoring that addresses groundwater contamination.
- Submit a summary report that outlines the work performed, as well as provides conclusions and recommendations. As appropriate include analytical data; a site map showing the location of any potential sensitive receptors, stockpiled soils and monitoring or sample locations; an area map; detailed well logs; and a groundwater contour map.
- As soon as practical, submit a site location map at an approximate scale of 1:24000 showing the location of the site. Please include a scale, a north arrow, the SMS site number, and a citation of the source map. The purpose of this map is to enable the SMS to enter the site location into a Geographical Information Systems database.

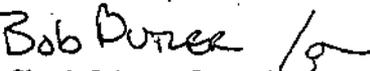
Please have your consultant submit a preliminary work plan and cost estimate or a site investigation expressway notification form within fifteen days of your receipt of this letter, so it may be approved prior to the initiation of onsite work. Enclosed please find a list of consultants who perform this type of work as well as the brochure "*Selecting Your UST Cleanup Contractor*," which will help you in choosing an environmental consultant.

Based on current information, the underground storage tanks at P.J. Market are eligible for participation in the Petroleum Cleanup Fund (PCF). You must provide written proof to the SMS that you hold no other applicable insurance in order to receive reimbursement from the PCF. The owner or permittee must pay for the removal and/or repair of the failed tank(s), and for the initial \$10,000.00 of the cleanup. The fund will reimburse the tank owner or permittee for additional / 100 percent of all eligible cleanup costs of up to \$1 million. All expenditures must be pre-approved by the Agency or performed in accordance with the "*Site Investigation Guidance*" expressway program. Please refer to the enclosed guidance document titled, "*Procedures for Reimbursement from the Petroleum Cleanup Fund*" for additional information concerning the PCF.

The Secretary of the Agency of Natural Resources reserves the right to seek cost recovery of fund monies spent at the P.J. Market site if the Secretary concludes that R. L. Vallee, Inc. is in significant violation of the Vermont Underground Storage Tank Regulations or the Underground Storage Tank statute (10 V.S.A., Chapter 59).

We realize this may be a lot to absorb and respond to. We are here to help make this process as effective and uncomplicated as possible. Please review the enclosed documents and call me with any questions you may have. I can be reached at (802) 241-3876.

Sincerely,


Chuck Schwer, Supervisor
Sites Management Section

Enclosures (3)

cc: Morrisville Selectboard w/o enclosure
Morrisville Health Officer w/o enclosure
DEC Regional Office w/o enclosure
Andrew Shively, Twin State Environmental w/o enclosure

CS:rgb
D:\Bobsfiles\Wp\10235.wpd

ATTACHMENT 2



ENDYNE, INC.

AUG 7 1998

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: PJ'S Market
REPORT DATE: August 3, 1998
DATE SAMPLED: July 21, 1998

PROJECT CODE: TSEC1796
REF.#: 124,354 - 124,359

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

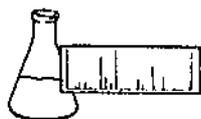
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Twin State Environmental Corp.

DATE RECEIVED: July 21, 1998

PROJECT NAME: PJ'S Market

REPORT DATE: August 3, 1998

CLIENT PROJ. #: 98047

PROJECT CODE: TSEC1796

Ref. #:	124,354	124,355	124,356	124,357	124,358
Site:	MW-1	MW-2	MW-3	MW-4	Dup-1
Date Sampled:	7/21/98	7/21/98	7/21/98	7/21/98	7/21/98
Time Sampled:	12:00	12:35	13:15	11:20	15:20
Sampler:	R.L.	R.L.	R.L.	R.L.	R.L.
Date Analyzed:	7/28/98	7/28/98	7/28/98	7/28/98	7/28/98
UIP Count:	0	0	0	0	0
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	85	98	93	97	90
Parameter	Conc. (ug/L)				
Benzene	<1	<1	<1	<1	<1
Naphthalene	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1
Xylenes	<1	<1	<1	<1	<1
MTBE	<10	<10	<10	<10	<10

Ref. #:	124,359				
Site:	F.B.				
Date Sampled:	7/21/98				
Time Sampled:	10:55				
Sampler:	R.L.				
Date Analyzed:	7/28/98				
UIP Count:	0				
Dil. Factor (%):	100				
Surr % Rec. (%):	89				
Parameter	Conc. (ug/L)				
Benzene	<1				
Naphthalene	<1				
1,2,4-Trimethylbenzene	<1				
1,3,5-Trimethylbenzene	<1				
Ethylbenzene	<1				
Toluene	<1				
Xylenes	<1				
MTBE	<10				

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

CHAIN-OF-CUSTODY RECORD

124351-265 190 by J

15F-1-174
TSEC 1797
27933

Project Name: <i>PJ'S MARKET</i>	Reporting Address: <i>SAMM AS</i>	Billing Address: <i>65 Huntington Rd Redmond, VT 05477</i>
Site Location:	Company: <i>Twin State Lin Corp</i>	Sampler Name: <i>Rob Lindsay</i>
Endyne Project Number: <i>TSEC 1796</i>	Contact Name/Phone #: <i>Jim Bordin</i>	Phone #: <i>4343350</i>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
124354	<i>mw-1</i>	<i>L</i>	<i>X</i>		<i>7:21:98</i> <i>1200</i>	<i>4</i>	<i>40ml 110A</i>			<i>CC/100</i>	
124355	<i>mw-2</i>				<i>1235</i>	<i>4</i>					
124356	<i>mw-3</i>	<i>M</i>			<i>1315</i>	<i>3</i>	<i>M</i>			<i>M</i>	
124357	<i>mw-4</i>				<i>1120</i>	<i>3</i>					
124358	<i>Duo-1</i>				<i>1520</i>	<i>4</i>					
124359	<i>F.B.</i>	<i>V</i>	<i>V</i>		<i>1055</i>	<i>4</i>	<i>V</i>			<i>V</i>	

Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time
Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>[Signature]</i>	Date/Time <i>7-21-98 1700</i>

New York State Project: Yes No Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): <i>SO213 & 8100M</i>										

AUG 10 1998



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: PJ's Market
DATE REPORTED: August 7, 1998
DATE SAMPLED: July 21, 1998

PROJECT CODE: TSEC1797
REF. #: 124,360 - 124,365

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

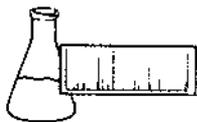
Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: August 7, 1998
CLIENT: Twin State Environmental Corporation
PROJECT: PJ's Market
PROJECT CODE: TSEC1797
COLLECTED BY: Rod Lindsay
DATE SAMPLED: July 21, 1998
DATE RECEIVED: July 21, 1998

Reference #	Sample ID	Concentration (mg/L) ¹
124,360	MW-1; 12:00	0.63
124,361	MW-2; 12:35	0.49
124,362	MW-3; 13:15	ND ²
124,363	MW-4; 11:20	0.44
124,364	Dup-1; 15:20	ND
124,365	F.B; 10:55	ND

Notes:

- 1 Values quantitated based on the response of #2 Fuel Oil. Method detection limit is 0.4 mg/L.
- 2 None Detected

Project Name: <i>PJ's Market</i> Site Location:	Reporting Address: <i>Saman RS</i>	Billing Address: <i>65 Huntington Rd Ridgmont, VT 05472</i>
Endyne Project Number: <i>TSEC 179.7</i>	Company: <i>Twin State Land Comp</i> Contact Name/Phone #: <i>Jim Burdick</i>	Sampler Name: <i>Rob Lindsay</i> Phone #: <i>434 3350</i>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
124360	mw-1	L	X		7.21.98 1200	4	400ml 100%			✓	
124361	mw-2				1235	4					
124362	mw-3	R	H		1345	3	R				
124363	mw-4				1120	3					
124364	Dup-1				1520	4					
124365	F.B.	✓	✓		1055	4	✓			✓	

Relinquished by: Signature	Received by: Signature	Date/Time
<i>[Signature]</i>	<i>[Signature]</i>	7.21.98 1700

New York State Project: Yes ___ No ___ Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): <i>SO213 & 8100m</i>										