



TWIN STATE ENVIRONMENTAL CORP.

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December 15, 1997

Mr. Guy Brosseau
c/o Simon the Tanner
P.O. Box 449
Island Pond, VT 05846

**RE: Initial Site Investigation
Former LaTouche Service Station, Island Pond, Vermont
TSEC Project # 97-003, SMS Site #96-2111**

WASTE MANAGEMENT
DIVISION

DEC 29 9 56 AM '97

Dear Mr. Brosseau:

Enclosed is the Site Investigation Report that was prepared to evaluate the environmental condition of the above mentioned SITE following the removal of three (3) gasoline underground storage tanks (USTs). This investigation was requested by the State of Vermont Agency of Natural Resources (ANR), Sites Management Section (SMS).

Soil and groundwater contamination was observed in the former UST excavation during tank removal activities in November 1996. Our recent subsurface investigation in October 1997 has indicated that petroleum contamination has impacted soil and groundwater beneath the SITE.

We have recommended that a quarterly groundwater sampling program be implemented at the SITE, and that the SITE building be monitored for petroleum vapors if it is to be reoccupied.

Please call to discuss our findings or other matters of concern.

Sincerely,
TWIN STATE ENVIRONMENTAL CORPORATION

Jon Berntsen
Geologist

encl.

cc: Mr. Chuck Schwer, ANR, SMS



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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 REPORT

December 15, 1997

Former LaTouche Service Station
Vermont Route 114
Island Pond, Vermont

Facility ID# 1143
SMS Site #96-2111
TSEC #97-003

Prepared for:
Mr. Guy Brosseau
c/o Simon the Tanner Shoe Shop
P.O. Box 449
Island Pond, VT 05846

Written By:

Jon Berntsen
Geologist

Reviewed By:

John R. Diego
Vice President

Dec 29 9 58 AM '97

1.0 INTRODUCTION

This Initial Site Investigation (ISI) Report has been prepared by Twin State Environmental Corporation (TSEC) to present the findings of environmental conditions encountered during a recent subsurface site investigation at the Former LaTouche Service Station in Island Pond, Vermont (SITE) (see SITE Location Map, **Figure 1**). This investigation was initiated in response to conditions encountered during the removal of three (3) on-SITE underground storage tanks (USTs); two (2) formerly containing gasoline and one (1) formerly containing diesel.

The USTs were removed from the SITE between November 14 and 16, 1996 by Wagner's Construction of West Burke, Vermont. A report prepared by Mr. George Wagner indicated that contaminated soil was encountered directly beneath the tank fill pipes and below the diesel tank bottom as indicated by elevated readings on a photoionization detector (PID) during the tank removal activities.

A test pit was excavated by Wagner's Construction mid-way between the tank cavity and the Clyde River (nearest sensitive receptor). A groundwater sample collected from this location was submitted to a laboratory for volatile organic compound (VOC) analysis. Benzene and MTBE were both reported above the US EPA Maximum Contaminant Levels (MCLs) for those compounds. Based on the amount of contamination present, it was determined that additional site work was necessary.

2.0 SCOPE OF SERVICES

The following scope of services was performed by TSEC during this investigation:

- Eleven (11) Geoprobe[®] borings were advanced to investigate soil and groundwater contamination resulting from the former USTs. Recovered soil samples were field screened using a PID equipped with a 10.6 eV lamp.
- Three (3) 1½ x ½-inch diameter prepacked groundwater monitoring wells, and three (3) standard 1-inch PVC monitoring wells were installed into six (6) of the above mentioned borings.
- Groundwater samples were collected from the six (6) newly installed monitoring wells and the Clyde River. Samples were submitted for analysis at Endyne by USEPA Method 8020 for volatile organic compounds (VOCs) and by US EPA Method 8100M for total petroleum hydrocarbons (TPH).

- Elevations of the six (6) on-SITE monitoring wells were surveyed, and locations were measured with respect to existing SITE structures. The data obtained has been used to create a site map, a groundwater flow map and contaminant concentration maps.
- A survey of sensitive receptors was conducted, focusing on surface water, residential basements (if present), and private drinking water wells.
- A summary report of the above-mentioned work was prepared.

3.0 SITE LOCATION AND DESCRIPTION

SITE Owners: Alan Casavant and Roger Griffin
SITE Address: Route 114 (Derby Street)
Island Pond, Vermont
Zoning: Commercial
Utilities: Water - Municipal Connection
Sewer - Municipal Connection
Electric - Overhead connection
Telephone - Overhead Connection
Structures: A two (2) story service station building and attached storage building

The SITE is located on the north side of Route 114, at the intersection of Dale Avenue and Route 114 (Derby Street), in Island Pond, Vermont (see SITE Location Map, **Figure 1**). Structures on SITE consist of a two (2) story service station with a storage building attached at the north end. The SITE grade at the south side of the building is at the second floor level. Behind the retaining wall (see SITE Plan, **Figure 2**), SITE grade is at the first floor level.

The site is commercially zoned and is situated in a mixed land use area. The properties adjacent to the site consist of a commercial property to the west; Route 114, with a residential neighborhood across it to the south; a residence to the east; and a wetland area with the Clyde River to the north. The river flows to the west.

The topography of the site slopes towards the north, down to the bank of the Clyde River. The nearest surface water, and potential receptor is the Clyde River, and an associated wetland area. The river is approximately 200 feet north of the former USTs.

4.0 UST CLOSURES ON SITE

Two (2) 4,000-gallon capacity gasoline USTs and one (1) 3,000-gallon capacity diesel UST were removed from the SITE between November 14 and November 16, 1997 by

Former LaTouche Service Station
Island Pond, VT
December 15, 1997

Wagner's Construction of West Burke, Vermont. The USTs, installed in the 1970's, have reportedly been out of service for approximately ten (10) years.

Soils encountered above the tank consisted of granular backfill. Soils above the tank (0 to 3.5 ft) exhibited PID readings between background and 300 parts per million volume (ppmv), with the highest readings directly adjacent to the UST fill ports.

Upon removal from the ground, each tank carcass was inspected for holes, pits, and corrosion. The tanks were all reportedly in good condition, with no corrosion holes present. Significant contamination was evident beneath the diesel UST.

Soils exhibiting elevated PID readings were removed from the ground and stockpiled on-SITE. The final tank excavation was completed to a depth of approximately 10 ft below ground surface (bgs). PID readings of samples collected at 10 ft bgs ranged from background to 125 ppmv. Based on the levels of contamination discovered during tank closure activities, additional investigation was recommended.

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

TSEC installed eleven (11) soil borings on SITE on October 2, 1997 using Geoprobe[®] direct push technology. Six (6) of the borings were converted into permanent monitoring wells. The borings were installed in the following locations and are depicted on the SITE Plan, **Figure 2**.

- Soil Boring B-1 was advanced in the former tank cavity. The boring was completed as Monitoring Well **MW-1**.
- Soil Boring B-2 was advanced adjacent to the former pump island.
- Soil Boring B-3 was advanced adjacent to the northeast corner of the former service station building, cross gradient of the former USTs.
- Soil Boring B-4 was advanced between the former service station building and Route 114, along the western SITE boundary. The boring was completed as **MW-2**.
- Soil Boring B-5 was advanced crossgradient of the former UST cavity, adjacent to the driveway to the lower level of the SITE. This boring was completed as **MW-3**.

Former LaTouche Service Station
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- Soil Boring B-6 was advanced downgradient of the former USTs, at the base of the stone retaining wall. This boring was completed as *MW-4*.
- B-7 was advanced directly downgradient of the test pit excavated by Wagner's Construction in November 1996.
- B-8 was advanced along the eastern SITE boundary to determine the potential for off-SITE migration of contaminants.
- B-9 was advanced mid way between the Clyde River and the former USTs.
- B-10 was advanced along the western SITE boundary. This boring was completed as *MW-5*.
- B-11 was advanced at the northern edge of the cleared area of the SITE, adjacent to the wetland. This boring was completed as *MW-6*.

Further details of the soil borings and monitor wells are presented below and in **Appendix A: Boring Logs**.

Borings were advanced to depths ranging from 4.0 to 16.0 feet bgs. All borings were logged, describing soil strata conditions, and analyzed with the PID using conventional jar headspace techniques.

General soil conditions encountered at the SITE consisted of fine to coarse sand with some gravel. Groundwater was encountered between 2.55 and 10.31 ft bgs in monitoring wells MW-6 and MW-2, respectively.

Contaminated soil was encountered during the installation of borings B-1, B-2, B-4, B-5, B-6, B-7, B-9, B-10, and B-11 as evidenced by positive PID headspace readings. A headspace analysis performed on the samples collected indicated a maximum PID reading of 968 ppmv in B-6 between 0 and 4 ft bgs. All other PID readings ranged between non detect (ND) and 647 ppmv. A heavy petroleum hydrocarbon (PHC) odor and product sheen was observed between 3.0 and 3.5 ft bgs in the sample retrieved from B-6.

Samples collected from soil borings B-3 and B-8 did not exhibit any elevated PID readings.

5.2 Monitor Well Installation

Six (6) of the above mentioned borings were completed as monitoring wells. Three (3) wells (MW-1, MW-4, and MW-5) are constructed of 1½ x ½-inch diameter prepacked groundwater monitoring wells. The remaining three (3) wells are constructed of 1-inch

PVC. The wells were installed in the locations described above and are depicted on the SITE Plan, **Figure 2**.

Further construction details of the monitoring wells are presented below and in **Appendix A: Monitoring Well and Boring Logs**.

5.2.1 Monitoring Well Construction

As previously mentioned, three (3) of the newly installed wells are 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.

The remaining three (3) monitoring wells are constructed of 1-inch schedule 40 PVC with 0.010-inch machine slotted screen. Standard construction techniques were used that included placing a clean filter pack in the boring annulus around the screened interval.

When installing both the 1½ x ½-inch wells and the 1-inch wells, a bentonite seal was placed above the screen, and the well was sealed with a locking expansion plug and a curb box set in concrete that is flush grade. The depths of the wells range from 6.4 to 15.4 ft bgs.

5.3 SITE Geology

A summary of the predominate geological units encountered during boring activities consisted of fine to coarse sand with some gravel. Reports published by the Vermont Geological Survey indicate that the surficial deposits in the SITE vicinity are comprised of kame complex deposits (ice contact outwash and gravel). Bedrock beneath the SITE is reportedly comprised of a Devonian age (365-405 million years ago) medium to coarse grained quartz monzonite known as the Nulhegan quartz monzonite. For a more detailed description of geological units, see Monitoring Well and Boring Logs, **Appendix A**.

5.4 SITE Survey

A Topcon AT-G6 auto level was used to perform a stadia survey to identify the location of the newly installed monitoring wells 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 installed wells. A fire hydrant located approximately 325± feet to the east of the SITE was used as a benchmark with an assumed elevation of 100 feet.

6.0 COLLECTION OF GROUNDWATER SAMPLES

Groundwater sampling was performed at this SITE by TSEC on October 16, 1997. Samples were collected from the newly installed wells MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6, as well as from the Clyde River. The samples were submitted to Endyne for analysis. Groundwater samples were analyzed by US EPA Method 8020 for VOCs, and by US EPA Method 8100M for TPH (Method 8100M was chosen for the TPH analyses because the area surrounding the former diesel tank had the highest concentration of contaminants during removal activities). The surface water sample was analyzed by US EPA Method 602 for VOCs.

6.1 Monitoring Well Sample Collection

Prior to sampling, depth to groundwater measurements were collected at all of the wells. Depth to water ranged from 2.55 to 10.31 ft bgs at monitoring wells MW-6 and MW-2, respectively.

To provide for a representative groundwater sample, each well was adequately purged of water with a low flow peristaltic pump with a dedicated discharge line. Purge water from the wells was discharged directly to the ground surface. Sampling at each location was conducted using a clean bailer.

Quality Assurance/Quality Control (QA/QC) samples incorporated into this sampling round included one (1) duplicate sample taken from monitoring well MW-1 and one (1) field blank. The samples were analyzed via US EPA Method 8020 for VOCs. All chemical analyses for this round of groundwater sampling were performed by Endyne Inc. of Williston, Vermont. The results of the groundwater sampling round are discussed in the following sections.

6.2 Clyde River Sample Collection

The sample from the Clyde River was collected by immersing a 40 ml clear glass vial into the river. The bottle was allowed to fill almost completely. Acid was added to the bottle, and the remainder of the bottle was filled using water collected in a clean, non-preserved 40 ml vial.

7.0 RESULTS OF SAMPLING ACTIVITIES

7.1 Groundwater Flow Direction

Groundwater levels on SITE were measured by TSEC personnel on October 16, 1997. As previously mentioned, depth to groundwater measurements ranged from 2.55 to

10.31 ft bgs at wells MW-6 and MW-2 respectively. A full analysis of groundwater elevation data is presented in **Table 1** (Summary of Groundwater Elevations).

Based on measured depths to groundwater observed in monitoring wells on SITE at the time of sampling, groundwater underlying the SITE has been calculated to flow to the northwest in the overburden aquifer, towards the Clyde River. A graphical presentation of the groundwater elevation data is included on the Groundwater Elevation Plan provided as **Figure 3**.

According to published hydraulic conductivity values for poorly sorted sands, the subsurface materials encountered at the SITE, the hydraulic conductivity for the aquifer ranges between 0.03 feet per day (ft/d) and 30 ft/d (Fetter, 1994). Under the measured site hydraulic gradient of 0.006 ft/ft (between wells MW-3 and MW-4), and an assumed formation porosity of 30%, the calculated apparent groundwater flow velocity beneath the site ranges from 0.0006 ft/d to 0.6 ft/d.

The groundwater elevations in the wells located in the northern portion of the SITE (MW-5 and MW-6) indicate that groundwater is flowing to the south, from the Clyde River. This may be attributed to one of the following reasons:

1. Groundwater at the SITE may be flowing towards a buried alluvial gravel feature located somewhere between MW-4 and MW-5. This feature may be lower in elevation than the Clyde River, thus causing groundwater to flow from the river to the feature.
2. At the time of sampling, the surface elevation of the Clyde River may have been higher than usual. This would cause the appearance of discharge from the river to the wells closer to the river.

After several more monitoring rounds, a groundwater flow direction trend should be established.

7.2 Analytical Results

7.2.1 Groundwater Results

VOC results received from Endyne indicate that target compounds are present in five (5) of the six (6) monitoring wells (MW-1, MW-2, MW-4, MW-5, and MW-6). Benzene is present above its MCL of 5 micrograms per liter ($\mu\text{g/l}$) in monitoring wells MW-1, and MW-4. MTBE is not present above the Vermont Health Advisory (VHA) standard of 40 $\mu\text{g/l}$, however the detection limit for MTBE in monitoring wells MW-1 and MW-4 are at 500 $\mu\text{g/l}$. Toluene, and total xylenes exceed their respective MCLs (1,000 $\mu\text{g/l}$, and

Former LaTouche Service Station
Island Pond, VT
December 15, 1997

10,000 $\mu\text{g/l}$ respectively) in MW-1 and MW-4. Ethylbenzene is present above its MCL of 700 $\mu\text{g/l}$ in MW-4. Duplicate results from MW-1 were also returned with benzene, toluene, and total xylenes above their respective limits.

Groundwater samples collected from monitoring wells were also analyzed for TPH. TPH values range from less than 800 $\mu\text{g/l}$ in the samples collected from MW-2 and MW-3, to 11,300 $\mu\text{g/l}$ in the sample collected from MW-1.

A summary table is provided as **Table 2**; the complete analytical laboratory report from Endyne is provided as **Appendix B**; and graphical representations of the BTEX and TPH distributions across the SITE are presented as **Figures 4 and 5**.

7.2.2 Surface Water Results

The water sample collected from the Clyde River did not contain any detectable concentrations of VOCs or TPH.

7.3 QA/QC Results

7.3.1 Relative Percent Difference

The relative percent difference (RPD) was calculated for BTEX compounds present in MW-1 to be 9.12%. MTBE was below its detection limit in MW-1 and the duplicate; therefore, the RPD was not calculated. An RPD of 25% or less is generally considered a good correlation between samples.

7.3.2 Laboratory QA/QC

Prior to VOC analysis, the pH of the sample is tested to ensure proper preservation. Groundwater samples collected from monitoring wells MW-2, MW-3, MW-4, and MW-5 were not properly preserved to a $\text{pH} < 2$. These samples were collected and containerized in laboratory preserved vials.

Values reported for monitoring wells MW-2, MW-3, and MW-5 may represent lower quantities than are actually present. Subsequent sampling rounds will determine if the effect of improper preservation was significant.

8.0 RECEPTOR EVALUATION

Following the removal of the USTs and the initial discovery of petroleum contamination at the SITE, a sensitive receptor evaluation was conducted in the immediate vicinity.

Former LaTouche Service Station
Island Pond, VT
December 15, 1997

This investigation focused on surface water receptors, groundwater supply wells, and residences.

Analytical data received from Endyne indicated that the Clyde River is not currently impacted by the contamination originating on-SITE. However, with detectable concentrations of contaminants less than 100 ft from the Clyde River, future impact is probable.

An assessment performed by others (referenced in a letter from the SMS to Mr. Aaron Gregoire) concerning potable water supplies in the vicinity, indicated that all residences in the area are serviced by the Town of Brighton Water Department. Additionally, water service lines are buried at depths well above the petroleum contamination.

There are no residential basements in the immediate vicinity of the SITE, and the SITE building is no longer used.

No other sensitive receptors were identified during this investigation

9.0 SUMMARY AND CONCLUSIONS

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

- The initial source of the contamination, the former USTs at the site, have been removed.
- Groundwater quality in monitoring wells MW-1 and MW-4 exceeds the MCLs for benzene, toluene, and total xylenes. Groundwater quality in MW-4 also exceeds the MCL for ethylbenzene. Three (3) additional wells, MW-2, MW-5, and MW-6, contain detectable concentrations of BTEX. No target compounds were detected in monitoring well MW-3.
- TPH concentrations in groundwater range from <800 µg/l (monitoring wells MW-2 and MW-3) to 11,300 µg/l (monitoring well MW-1).
- Based on the distribution of the contaminants in groundwater, it appears as though there is a co-mingled gasoline and diesel plume.
- The surface water sample collected from the Clyde River did not contain any detectable concentrations of target compounds. However, with groundwater flowing to the northwest, towards the Clyde River, there is potential for the river to be contaminated directly from this SITE.

- With municipal water supplying all neighboring properties, it does not appear as though any drinking water sources are at risk.

10.0 RECOMMENDATIONS

Due to the presence of contamination in both soil and groundwater at the SITE, TSEC recommends the following:

- Based on the degree of groundwater contamination present, a quarterly monitoring program is suggested. This program would include the sampling of the six (6) on-SITE groundwater monitoring wells and the Clyde River for BTEX and MTBE. Groundwater samples would be analyzed via US EPA Method 8020, and surface water samples would be analyzed via US EPA Method 602.

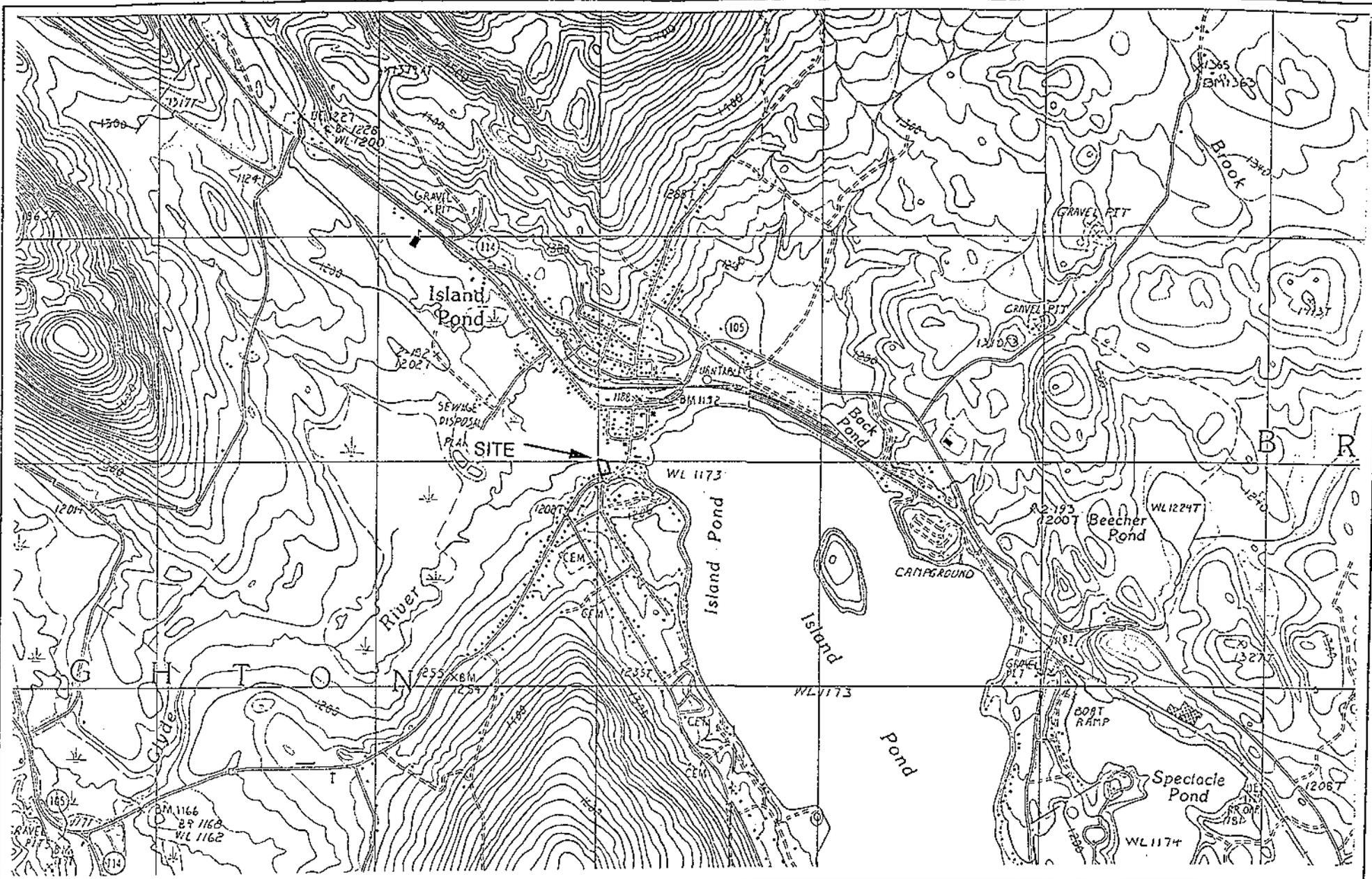
Following one (1) year of quarterly monitoring, the sampling frequency will be reevaluated.

- Due to the potential for a co-mingled plume of gasoline and diesel, chromatograms should be obtained from the recent sampling event to aid in selecting the analyses for the proposed groundwater sampling program.

Following a review of the chromatograms, it may be necessary to test for TPH as gas (Modified US EPA Method 8015) and polynuclear aromatic hydrocarbons (PAH) (US EPA Method 8270 PAH only). This testing would be performed during the next sampling event. The data will be evaluated to determine if further testing with these methods will be necessary.

- Prior to reoccupation of the garage building, an air quality monitoring program should be established. This program may include PID screening of ambient air and/or soil borings inside the building.

FIGURES



N



Source: USGS 7.5 Minute Topographic Series
Island Pond and Spectacle Pond, Vermont Quadrangles

Project No:
97-003

Designed By: jpb
Checked By:
Approved By:
Drawn By: jpb
Scale: as shown
Date: 10/15/97

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FIGURE 1
SITE LOCATION MAP
Former LaTouche Service Station
Island Pond, Vermont

Vermont Route 114

Approximate extent of Former USI excavation

Sidewalk

MW-3/
B-5

MW-1/
B-1

B-2

MW-2/
B-4

B-3

Trees and brush

Trees and brush

Stairs

Retaining Wall

Retaining Wall

Pole
excavated
Site
Structure

MW-4/
B-6

Former
Service
Station
Building

Property Boundary

B-7

B-8

B-9

MW-5/
B-10

Edge of
Cleared Area

MW-6/
B-11

MW-1/
B-1

LEGEND

Soil boring location; monitoring well installed.

B-2

Soil boring location; no monitoring well installed.

SW-1

Surface Water sampling location.

SW-1

Clyde River

Flow

Wetland
Area

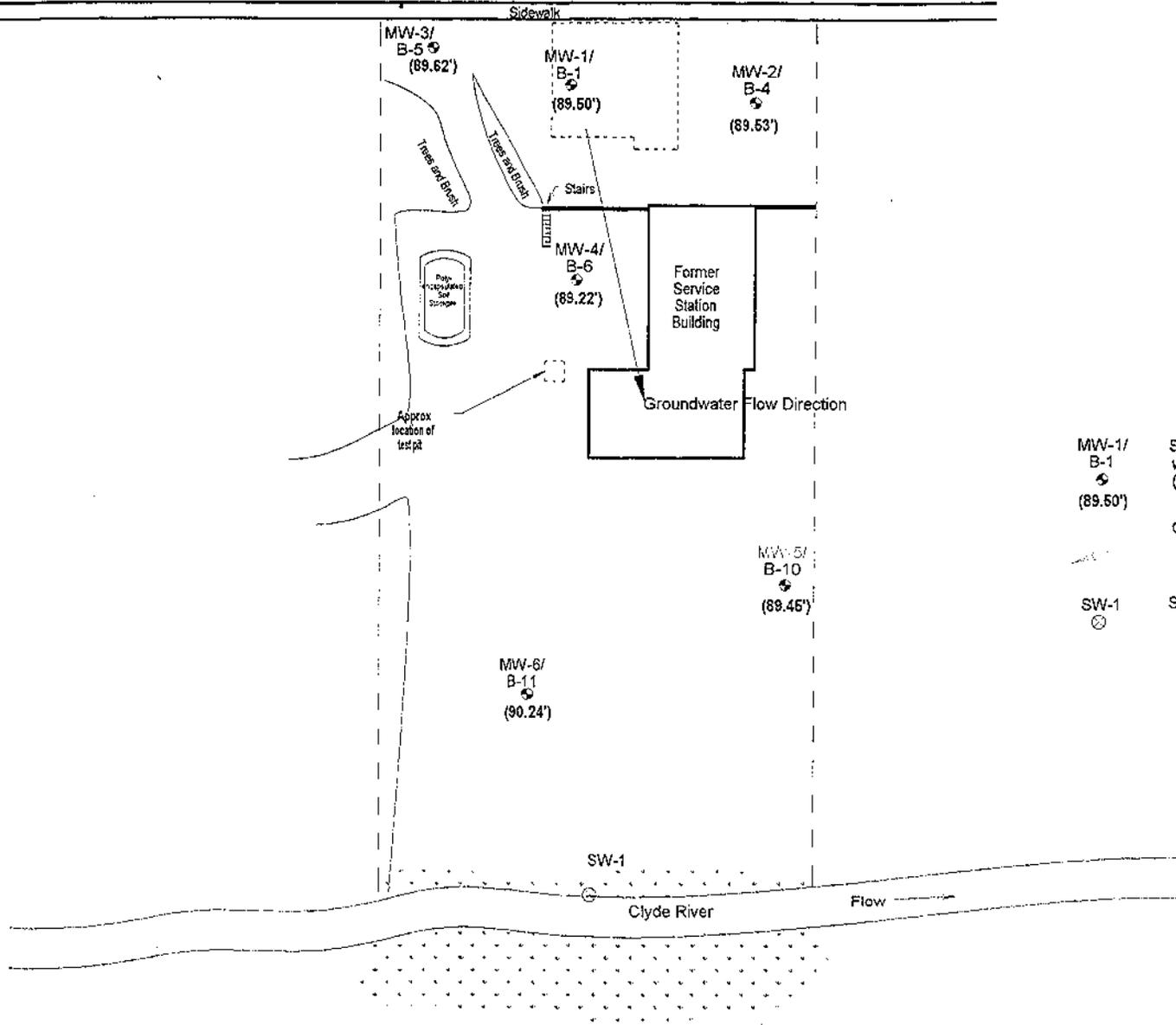


Project No:	97-003
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Date:	12/05/97

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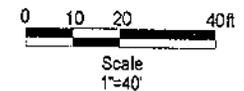
FIGURE 2
SITE Plan
Former LaTouche Service Station
Island Pond, Vermont

Vermont Route 114



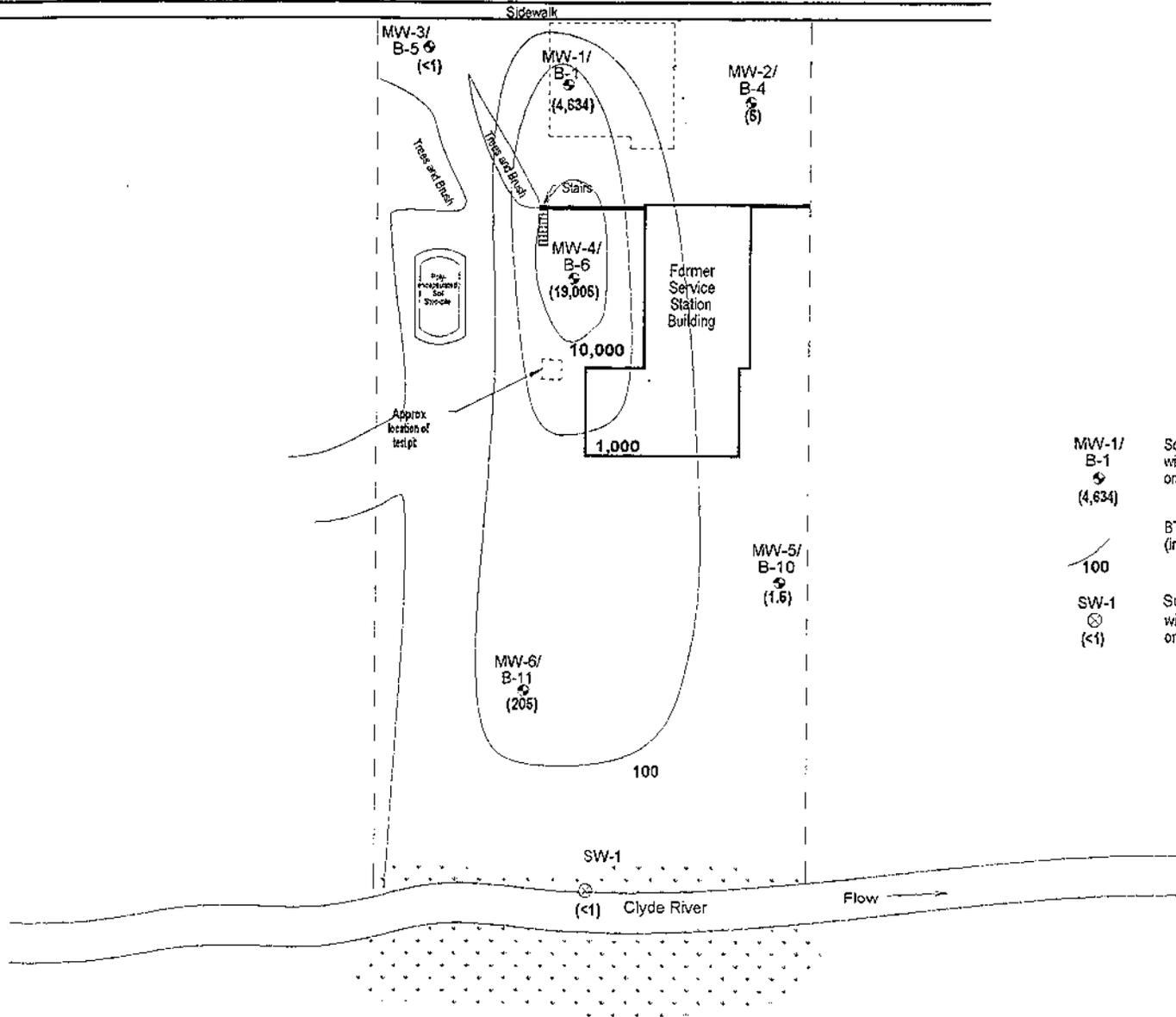
LEGEND

- MW-1/
B-1
⊕
(89.50') Soil boring location; monitoring well installed, with groundwater table elevation on October 16, 1997 (in feet).
- Groundwater flow direction.
- ⊗ SW-1 Surface Water sampling location.



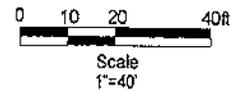
Project No: 97-003	Designed By: jpb	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 3 GROUNDWATER ELEVATION PLAN October 16, 1997 Former LaTouche Service Station Island Pond, Vermont
	Checked By:		
	Approved By:		
	Drawn By: jpb		
	Scale: 1"=40'		
Date: 12/05/97			

Vermont Route 114



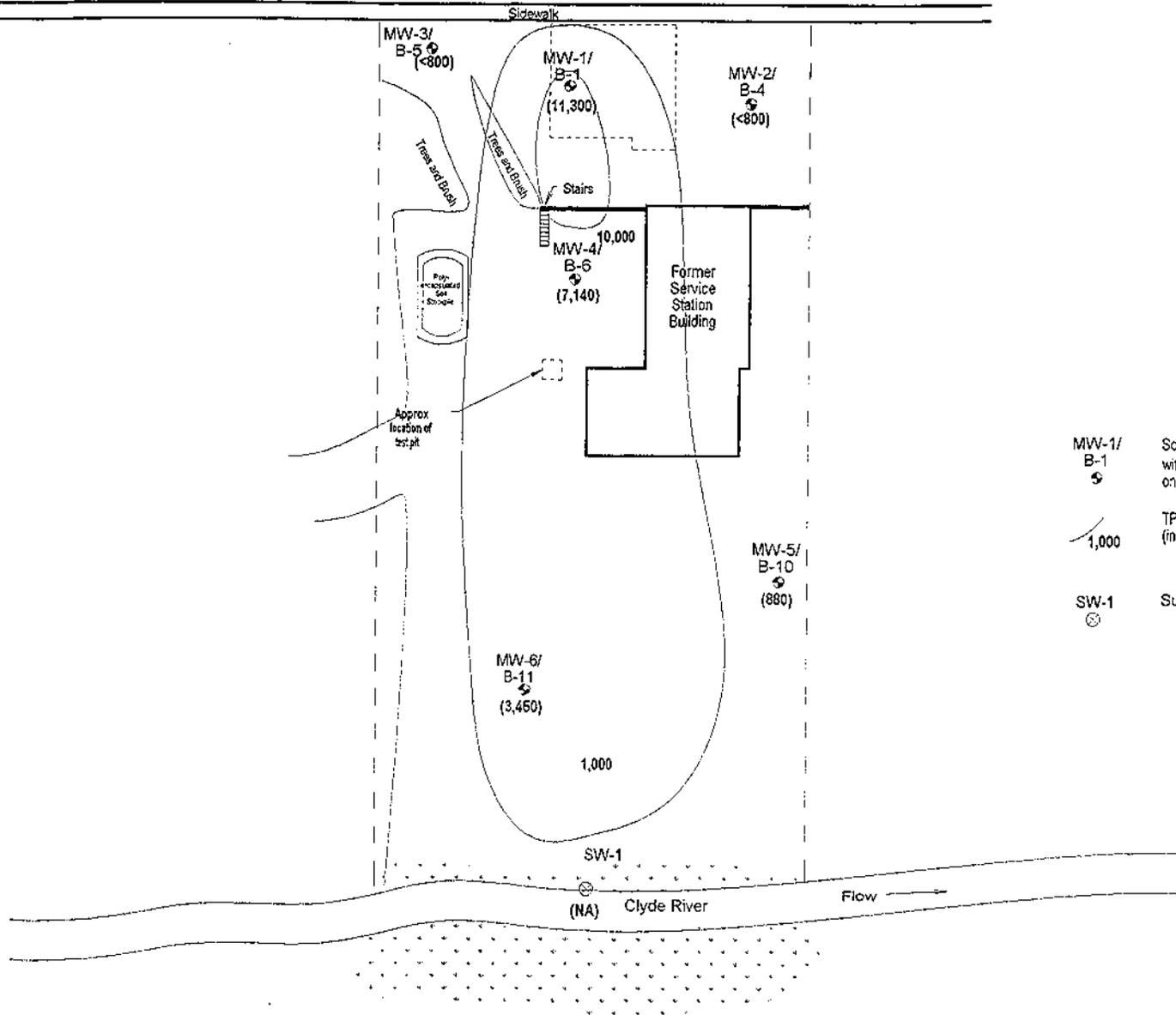
LEGEND

- MW-1/
B-1
↕
(4,634)
Soil boring location; monitoring well installed, with total BTEX concentration in groundwater on October 16, 1997 (in ug/l).
- 100
BTEX concentration contour in groundwater (in ug/l).
- ⊗
SW-1
(<1)
Surface Water sampling location, with total BTEX concentration in surface water on October 16, 1997 (in ug/l).



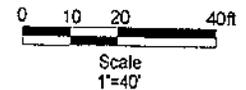
Project No: 97-003	Designed By: jpb	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 4 BTEX ISOPLETH PLAN October 16, 1997 Former LaTouche Service Station Island Pond, Vermont
	Checked By:		
	Approved By:		
	Drawn By: jpb		
	Date: 12/05/97		

Vermont Route 114



LEGEND

- MW-1/
B-1
☉ Soil boring location; monitoring well installed with TPH concentrations in groundwater on October 16, 1997 (in ug/l).
- 1,000
— TPH concentration contour in groundwater (in ug/l).
- SW-1
⊗ Surface Water sampling location.



Project No:	97-003
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FIGURE 6
 TPH ISOPLETH PLAN
 October 16, 1997
 Former LaTouche Service Station
 Island Pond, Vermont

TABLES

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS
 Former LaTouche Service Station
 Island Pond, Vermont

October 16, 1997

Well Identification	Top of Riser Elev.	Depth to Product	Depth to Water	Depth of Well	Thickness of Water Column in Well	Water Table Elev.
MW-1	99.60	ND	10.10	15.35	5.25	89.50
MW-2	99.84	ND	10.31	14.65	4.34	89.53
MW-3	98.92	ND	9.30	14.65	5.35	89.62
MW-4	92.63	ND	3.41	6.39	2.98	89.22
MW-5	93.05	ND	3.60	8.10	4.50	89.45
MW-6	92.79	ND	2.55	6.90	4.35	90.24

Notes:

1. Elevation are referenced to a Temporary Benchmark, and are presented in units of feet.
2. ND - not detected.
3. NA - not applicable.
4. Measurement 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.

ipb:\project\97-003ip\wettab.xls\October 16, 1997

TABLE 2

SUMMARY OF GROUNDWATER QUALITY
Former LaTouche Service Station
Island Pond, Vermont

October 16, 1997

Test	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Total BTEX	MTBE	TPH
Sample ID	Concentration, ppb						
MW-1	597	1,850	107	2,080	4,634	<500	11,300
MW-2	3.4	<	<1	1.6	5	<10	<800
MW-3	<1	<1	<1	<1	--	<10	<800
MW-4	235	4,370	2,500	11,900	19,005	<500	7,140
MW-5	<1	<1	<1	1.5	1.5	<10	880
MW-6	4.6	4.5	30.1	166	205	<20	3,450
DUP-1	535	1,530	165	2,000	4,230	<500	11,700
SW-1	<1	<1	<1	<1	--	<10	NA
Field Blank	<1	<1	<1	<1	--	<10	NA
MCL	5	1,000	700	10,000	--	40 (1)	--

Notes:

1. MCL - Maximum Contaminant Level promulgated by USEPA.
2. (1) - Vermont Health Advisory (VHA) standard for MTBE.
3. All groundwater samples were analyzed using US EPA Method 8020.
4. Surface water sample SW-1 was analyzed using US EPA Method 602.
5. TPH samples were analyzed by US EPA Method 8100M
6. **Bold and italic** numbers indicate concentrations that exceed MCLs or VHA standards.
7. NA - indicated that sample was not analyzed for parameter.

jp:\project\97-003ip\gwqual.xls\October 16,1997

APPENDIX A



TWIN STATE ENVIRONMENTAL CORPORATION

1A 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:	16.0 ft	BORING DEPTH:	16.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	10.10 ft on 10/16/97		
PROJECT NO:	97-003	SCREEN DIA:	1 1/2-inch	DEPTH:	11.0-16.0 ft bgs
INSTALL DATE:	October 2, 1997	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:	0.5-11.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macro-core	RISER CAP:	Locking j-plug.		
REMARKS:					

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0		0-4	<1	1.5 ft recovery	0.0-1.5: Medium to coarse sand and gravel tank cavity fill material.	CEMENT GROUT NATIVE BACKFILL BENTONITE SEAL SAND PACK WELL SCREEN RISER PIPE HS HEAD SPACE WATER LEVEL (APPROX)	
1							
2							
3							
4			4-8	<1	2.0 ft recovery	4.0-6.0: Medium to coarse sand and gravel tank cavity fill material.	
5							
6							
7							
8			8-12	647	1.5 ft recovery	8.0-9.5: Medium to coarse sand and gravel tank cavity fill material. 9.5-9.8: Organic peat material. Black. Petro odor.	
9							
10							
11							
12			12-16	164.2	3.5 ft recovery	12.0-12.5: Cave in from above-Sand and gravel. 12.5-13.0: Fine to very fine sand. Tan, saturated. 13.0-13.2: Sand, medium. Tan, saturated. 13.2-15.5: Medium to coarse sand and gravel. Tan/brown, saturated. End of Sampling = 16.0 feet. End of Boring = 16.0 feet.	
13							
14							
15							
16							
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 well and 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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 (802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-2	WELL DEPTH:	N/A	BORING DEPTH:	16.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:			12.5 ft on October 2, 1997
PROJECT NO:	97-003	SCREEN DIA:	N/A	DEPTH:	N/A
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:	N/A		
TSEC REP:	Jon Berntsen	RISER TYPE:	N/A		
DRILLING CO:	TSEC	RISER DIA:	N/A	DEPTH:	N/A
DRILLING METHOD:	Geoprobe [®]	GUARD TYPE:	NA/		
SAMPLING METHOD:	Macro-core	RISER CAP:	N/A		
REMARKS:	Soil boring has been backfilled with bentonite and sand to grade.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<1	1.5 ft recovery	0.0-1.5: Medium to coarse sand and gravel tank cavity fill material.	CEMENT GROUT
1	O					NATIVE BACKFILL
2						BENTONITE SEAL
3	W					SAND PACK
4	E	4-8	<1	1.5 ft recovery	4.0-5.5: Medium to coarse sand and gravel tank cavity fill material.	WELL SCREEN
5	L					RISER PIPE
6	L					HEAD SPACE
7						WATER LEVEL (APPROX)
8	I	8-12	<1	1.5 ft recovery	8.0-9.5: Medium to coarse sand and gravel tank cavity fill material.	
9	N					
10	S					
11	T					
12	A	12-16	7.2	3.5 ft recovery	12.0-12.5: Organic peat material. Black. 12.5-14.0: Medium to coarse sand and fine gravel. Saturated, tan.	
13	L					
14	L					
15	E					
16	D				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 well and 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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 (802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-3	WELL DEPTH:	N/A	BORING DEPTH:	8.5 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	N/A		
PROJECT NO:	97-003	SCREEN DIA:	N/A	DEPTH:	N/A
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:	N/A		
TSEC REP:	Jon Berntsen	RISER TYPE:	N/A		
DRILLING CO:	TSEC	RISER DIA.:	N/A	DEPTH:	N/A
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	NA/		
SAMPLING METHOD:	Macro-core	RISER CAP:	N/A		
REMARKS:	Soil boring has been backfilled with bentonite and sand to grade.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<1	1.5 ft recovery	0.0-1.5: Medium to coarse sand and gravel tank cavity fill material.	
1	O					
2						
3	W					
4	E	4-8	<1	1.5 ft recovery	4.0-5.5: Medium to coarse sand and gravel tank cavity fill material.	
5	L					
6	L					
7						
8	I	8-12	<1	0.5 ft recovery	8.0-9.5: Medium to coarse sand and gravel tank cavity fill material.	
9	N			Refusal @ 8.5 ft		
10	S					
11	T					
12	A					
13	L					
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 well and 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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 (802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-4/MW-2	WELL DEPTH:	16.0 ft	BORING DEPTH:	16.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	10.31 ft on 10/16/97		
PROJECT NO:	97-003	SCREEN DIA:	1-inch	DEPTH:	6.0-16.0 ft bgs
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	1-inch	DEPTH:	0.5-6.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macro-core	RISER CAP:	Locking j-plug.		
REMARKS:					

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0		0-4	1.7	1.5 ft recovery	0.0-0.5: Silty topsoil. Dry, dark brown. 0.5-1.5: Medium sand with little fine gravel (fill). Tan, dry.	CEMENT GROUT NATIVE BACKFILL BENTONITE SEAL SAND PACK WELL SCREEN RISER PIPE HS HEAD SPACE WATER LEVEL (APPROX)
1						
2						
3						
4			4-8	5.2	0.5 ft recovery	4.0-4.5: Medium to coarse sand and fine gravel. Tan, dry.
5						
6						
7						
8			8-12	<1	3.0 ft recovery	8.0-10.0: Silty sand and organic material (former grade). Damp, brown.
9						
10						10.0-11.0: Fine to coarse sand (graded). Tan, saturated.
11						
12			12-16	<1	4.0 ft recovery	12.0-13.6: Medium to coarse sand. Tan, saturated. 13.6-14.2: Silty medium sand. Tan, saturated. 14.2-16.0: Very coarse sand and fine to medium gravel. Tan, saturated.
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

GRANULAR SOILS BLOWS/FT DENSITY 0-4 V.LOOSE 4-10 LOOSE 10-30 MDENSE 30-50 DENSE >50 V.DENSE		COHESIVE SOILS BLOWS/FT DENSITY <2 V.SOFT 2-4 SOFT 4-8 M.STEFF 8-15 STIFF 15-30 V.STEFF >30 HARD		PROPORTIONS USED TRACE 0-10% LITTLE 10-20% SOME 20-35% AND 35-50%		NOTES: 1. See Figure 2, SITE Plan for well and 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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 (802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-5/MW-3	WELL DEPTH:	16.0 ft	BORING DEPTH:	16.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	9.30 ft on 10/16/97		
PROJECT NO:	97-003	SCREEN DIA:	1-inch	DEPTH:	6.0-16.0 ft bgs
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	1-inch	DEPTH:	0.5-6.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macro-core	RISER CAP:	Locking j-plug.		
REMARKS:					

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0		0-4	<1	2.2 ft recovery	0.0-2.2: Medium and coarse sand with little fine gravel. Tan, dry.	CEMENT GROUT NATIVE BACKFILL BENTONITE SEAL SAND PACK WELL SCREEN RISER PIPE HS HEAD SPACE WATER LEVEL (APPROX)	
1							
2							
3							
4			4-8	<1	2.0 ft recovery	4.0-5.0: Medium to coarse sand and fine gravel. Tan, dry. 5.0-6.0: Silty medium sand. Tan, dry.	
5							
6							
7							
8			8-12	<1	1.5 ft recovery	8.0-9.0: Medium to coarse sand. Tan, dry. 9.0-9.5: Silty fine sand with trace of organic material. Brown, dry.	
9							
10							
11							
12			12-16	12.5	4.0 ft recovery	12.0-13.6: Medium and coarse sand. Tan, saturated. Slight PHC odor.	
13							
14							
15							
16							
17						End of Sampling = 16.0 feet. End of Boring = 16.0 feet.	
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 well and 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

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 (802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-6/MW-4	WELL DEPTH:	7.0 ft	BORING DEPTH:	8.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	3.41 ft on 10/16/97		
PROJECT NO:	97-003	SCREEN DIA:	1½x½-inch	DEPTH:	2.0-7.0 ft bgs
INSTALL DATE:	October 2, 1997	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:	0.5-2.0 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macro-core	RISER CAP:	Locking j-plug.		
REMARKS:					

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0		0-4	968	3.0 ft recovery	0.0-2.0: Fine to coarse sand and gravel. Sheen at 3.0 feet. Strong PHC odor.		
1							
2							
3							
4			4-8	859	2.0 ft recovery	4.0-5.0: Medium to coarse sand. Strong PHC odor. Saturated, tan. 5.0-6.0: Broken coarse gravel. Tan, saturated.	
5							
6							
7							
8					End of Sampling = 8.0 feet. End of Boring = 8.0 feet.		
9							
10							
11							
12							
13							
14							
15							
16							
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 well and 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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MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-7	WELL DEPTH:	N/A	BORING DEPTH:	4.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	N/A		
PROJECT NO:	97-003	SCREEN DIA:	N/A	DEPTH:	N/A
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:	N/A		
TSEC REP:	Jon Berntsen	RISER TYPE:	N/A		
DRILLING CO:	TSEC	RISER DIA.:	N/A	DEPTH:	N/A
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	NA/		
SAMPLING METHOD:	Macro-core	RISER CAP:	N/A		
REMARKS:	Soil boring has been backfilled with bentonite and sand to grade.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	58.1	2.0 ft recovery	0.0-2.0: Medium to coarse sand and gravel. Tan, damp. End of Sampling = 4.0 feet. End of Boring = 4.0 feet.	
1	O					
2						
3	W					
4	E					
5	L					
6	L					
7						
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
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 well and 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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MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-8	WELL DEPTH:	N/A	BORING DEPTH:	4.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	N/A		
PROJECT NO:	97-003	SCREEN DIA:	N/A	DEPTH:	N/A
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:	N/A		
TSEC REP:	Jon Berntsen	RISER TYPE:	N/A		
DRILLING CO:	TSEC	RISER DIA.:	N/A	DEPTH:	N/A
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	NA/		
SAMPLING METHOD:	Macro-core	RISER CAP:	N/A		
REMARKS:	Soil boring has been backfilled with bentonite and sand to grade.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0	N	0-4	<1	3.0 ft recovery	0.0-2.5: Silty medium sand. Tan, dry. 2.5-3.0: Coarse sand and gravel. Saturated at 2.4 ft. Tan.	CEMENT GROUT	
1	O					NATIVE BACKFILL	
2						BENTONITE SEAL	
3	W					SAND PACK	
4	E				End of Sampling = 4.0 feet. End of Boring = 4.0 feet.	WELL SCREEN	
5	L					RISER PIPE	
6	L					HS HEAD SPACE	
7						WATER LEVEL (APPROX)	
8	I						
9	N						
10	S						
11	T						
12	A						
13	L						
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 well and 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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MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-9	WELL DEPTH:	N/A	BORING DEPTH:	4.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:			N/A
PROJECT NO:	97-003	SCREEN DIA:	N/A	DEPTH:	N/A
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:			N/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:	Macro-core	RISER CAP:	N/A		
REMARKS:	Soil boring has been backfilled with bentonite and sand to grade.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	8.8	3.0 ft recovery	0.0-2.0: Medium and coarse sand with gravel. Tan, saturated.	
1	O					
2						
3	W					
4	E				End of Sampling = 4.0 feet. End of Boring = 4.0 feet.	
5	L					
6	L					
7						
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
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 well and 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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 (802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-10/MW-5	WELL DEPTH:	8.5 ft	BORING DEPTH:	12.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	3.60 ft on 10/16/97		
PROJECT NO:	97-003	SCREEN DIA:	1 1/2 x 1/2-inch	DEPTH:	3.5-8.5 ft bgs
INSTALL DATE:	October 2, 1997	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:	0.5-3.5 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macro-core	RISER CAP:	Locking j-plug.		

REMARKS:

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0		0-4	<1	2.0 ft recovery	0.0-1.0: Silty sand topsoil material. Dark brown, dry. 1.0-2.0: Coarse sand and gravel. Tan, dry.	CEMENT GROUT NATIVE BACKFILL BENTONITE SEAL SAND PACK WELL SCREEN RISER PIPE HS HEAD SPACE WATER LEVEL (APPROX)	
1							
2							
3							
4			4-8	5.2	1.5 ft recovery	4.0-5.5: Medium to coarse sand. Saturated, tan.	
5							
6							
7							
8			8-12	<1	3.0 ft recovery	8.0-12.0: Medium to coarse sand. Saturated, tan.	
9							
10							
11							
12					End of Sampling = 12.0 feet. End of Boring = 12.0 feet.		
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

GRANULAR SOILS BLOWS/FT DENSITY 0-4 V.LOOSE 4-10 L.OOSE 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 well and 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

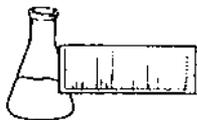
1A Huntington Road, P.O. Box 719 Richmond, Vermont 05477
 (802) 434-3350 FAX: (802) 434-4478

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-11/MW-6	WELL DEPTH:	7.5 ft	BORING DEPTH:	8.0 ft
PROJECT NAME:	Island Pond SI	DEPTH TO WATER:	2.55 ft on 10/16/97		
PROJECT NO:	97-003	SCREEN DIA:	1-inch	DEPTH:	2.5-7.5 ft bgs
INSTALL DATE:	October 2, 1997	SCREEN TYPE/SIZE:	0.010 slot Schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	1-inch	DEPTH:	0.5-2.5 ft bgs
DRILLING METHOD:	Geoprobe®	GUARD TYPE:	Flush mounted aluminum road box.		
SAMPLING METHOD:	Macro-core	RISER CAP:	Locking j-plug.		
REMARKS:					

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND	
0		0-4	<1	2.0 ft recovery	0.0-0.5: Silty topsoil. Dry, dark brown. 0.5-1.5: Fine, medium, and coarse sand. Tan, damp.	CEMENT GROUT NATIVE BACKFILL BENTONITE SEAL SAND PACK WELL SCREEN RISER PIPE HS HEAD SPACE WATER LEVEL (APPROX)	
1							
2							
3							
4			4-8	22.9	2.0 ft recovery	4.0-6.0: Coarse sand and fine gravel. Tan, dry.	
5							
6							
7							
8						End of Sampling = 8.0 feet. End of Boring = 8.0 feet.	
9							
10							
11							
12							
13							
14							
15							
16							
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 well and 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



ENDYNE, INC.

Laboratory Services

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

NOV 3 REC'D

REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Island Pond
REPORT DATE: October 30, 1997
DATE SAMPLED: October 16, 1997

PROJECT CODE: TSEC1934
REF.#: 111,711 - 111,719

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. However, samples 111712-111715 were found to not have been preserved to a pH of <2.

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



EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Twin State Environmental Corp.

DATE RECEIVED: October 17, 1997

PROJECT NAME: Island Pond

REPORT DATE: October 30, 1997

CLIENT PROJ. #: NI

PROJECT CODE: TSEC1934

Ref. #:	111,711	111,712	111,713	111,714	111,715
Site:	MW-1	MW-2	MW-3	MW-4	MW-5
Date Sampled:	10/16/97	10/16/97	10/16/97	10/16/97	10/16/97
Time Sampled:	12:58	13:06	13:14	13:21	13:28
Sampler:	R. Lindsay				
Date Analyzed:	10/26/97	10/26/97	10/26/97	10/24/97	10/24/97
UIP Count:	9	0	>10	>10	>10
Dil. Factor (%):	2	100	100	2	100
Surr % Rec. (%):	89	93	88	109	95
Parameter	Conc. (ug/L)				
Benzene	597.	3.4	<1	235.	TBQ <1
Chlorobenzene	<50	<1	<1	<50	<1
1,2-Dichlorobenzene	<50	<1	<1	<50	<1
1,3-Dichlorobenzene	<50	<1	<1	<50	<1
1,4-Dichlorobenzene	<50	<1	<1	<50	<1
Ethylbenzene	107.	<1	<1	2,500.	<1
Toluene	1,850.	<1	<1	4,370.	<1
Xylenes	2,080.	1.6	<1	11,900.	1.5
MTBE	<500	<10	<10	<500	<10

Ref. #:	111,716	111,717	111,718	111,719	
Site:	MW-6	SW-1	Dup-1	F.B.	
Date Sampled:	10/16/97	10/16/97	10/16/97	10/16/97	
Time Sampled:	13:35	13:38	13:41	12:00	
Sampler:	R. Lindsay	R. Lindsay	R. Lindsay	R. Lindsay	
Date Analyzed:	10/28/97	10/27/97	10/28/97	10/25/97	
UIP Count:	>10	0	>10	0	
Dil. Factor (%):	50	100	2	100	
Surr % Rec. (%):	90	104	78	96	
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	
Benzene	4.6	<1	535.	<1	
Chlorobenzene	<2	<1	<50	<1	
1,2-Dichlorobenzene	<2	<1	<50	<1	
1,3-Dichlorobenzene	<2	<1	<50	<1	
1,4-Dichlorobenzene	<2	<1	<50	<1	
Ethylbenzene	30.1	<1	165.	<1	
Toluene	4.5	<1	1,530.	<1	
Xylenes	166.	<1	2,000.	<1	
MTBE	<20	<10	<500	<10	

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

CHAIN-OF-CUSTODY RECORD

23844

Project Name: <u>Island Pond</u> Site Location: <u>97003</u>	Reporting Address: <u>SAMA AS</u>	Billing Address: <u>1A Huntington Rd. - Concord, VT 05477</u>
Endyne Project Number: <u>TBEC 1934</u>	Company: <u>Twin State Univ. Corp.</u> Contact Name/Phone #: <u>Tom Bernstein</u>	Sampler Name: <u>R. Lindsay</u> Phone #: <u>434-3350</u>

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				
111711	MW-1	L	X		10/16/97 1258	2	400ml VSA	8020 + MTBE + 8100 M TPH ONLY		HCL/ice	
111712	MW-2				1306						
111713	MW-3				1314						
111714	MW-4				1321						
111715	MW-5				1328						
111716	MW-6				1335						
111717	SW-1				1338				602		
111718	Dep-1				1341			8020 + MTBE + 8100 M TPH ONLY			
111719	F.B.				1200				8020 + MTBE		

Relinquished by: Signature <u>[Signature]</u>	Received by: Signature <u>[Signature]</u>	Date/Time <u>10/16/97 1630</u>
Relinquished by: Signature <u>[Signature]</u> <u>10/17/97</u>	Received by: Signature <u>[Signature]</u>	Date/Time <u>10/17/97 9:35</u>

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 3080 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):										



ENDYNE, INC.

Laboratory Services

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

REPORT OF LABORATORY ANALYSIS

NOV 10 REC'D

CLIENT: Twin State Environmental Corp.
PROJECT NAME: Island Pond/97003
DATE REPORTED: November 5, 1997
DATE SAMPLED: October 16, 1997

PROJECT CODE: TSEC1935
REF. #: 111,720 - 111,726

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



LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: November 5, 1997
CLIENT: Twin State Environmental Corp.
PROJECT: Island Pond/97003
PROJECT CODE: TSEC1935
COLLECTED BY: R. Lindsay
DATE SAMPLED: October 16, 1997
DATE RECEIVED: October 17, 1997

Reference #	Sample ID	Concentration (mg/L) ¹
111,720	MW1; 1258	11.3
111,721	MW2; 1306	ND ²
111,722	MW3; 1314	ND
111,723	MW4; 1321	7.14
111,724	MW5; 1328	0.88
111,725	MW6; 1335	3.45
111,726	Dup-1; 1341	11.7

Notes:

- 1 Method detection limit is 0.8 mg/L.
- 2 None detected

CHAIN-OF-CUSTODY RECORD

23844

Project Name: <u>Island Pond</u>	Reporting Address: <u>SAMA AS</u>	Billing Address: <u>1A Huntington Rd. Richmond, VT 05477</u>
Site Location: <u>97003</u>	Company: <u>Twin State Lowy Corp</u>	Sampler Name: <u>R. Lindsay</u>
Endyne Project Number: <u>TBEC 1935</u>	Contact Name/Phone #: <u>Jan Bernstein</u>	Phone #: <u>434-3350</u>

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				
111720	MW-1	L	X		10-16-97 1258	2	40ml WPA	8020 + MTBE + 8100 M TPH ONLY		HCL/ice	
111721	MW-2				1306						
111722	MW-3				1314						
111723	MW-4				1321						
111724	MW-5				1328						
111725	MW-6				1335						
	SW-1				1338				602		
111726	Dug-1				1341			8020 + MTBE + 8100 M TPH ONLY			
	F.B.				1200				8020 + MTBE		

Relinquished by: Signature <u>[Signature]</u>	Received by: Signature <u>[Signature]</u>	Date/Time <u>10-16-97 1630</u>
Relinquished by: Signature <u>[Signature]</u> 10/17/97	Received by: Signature <u>[Signature]</u>	Date/Time <u>10/17/97 9:35</u>

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):										