TWIN STATE ENVIRONMENTAL CORPORATION
Environmental Scientists and Engineers

October 26, 1999

Mr. Lee Marchessault
Green Mountain Power Corporation
163 Acorn Lane
Colchester, Vermont 05466

RE: Supplemental Site Assessment Report
GMP Plant #4 – Montpelier, Vermont
SMS Site #98-2562; TSEC Project #97038

Dear Mr. Marchessault:

Twin State Environmental Corporation (TSEC) has prepared the enclosed Supplemental SITE Investigation Report to detail the findings of recent environmental investigation activities at the Green Mountain Power Corporation (GMP) Plant #4 (SITE) (VT SMS Site #98-2562). The SITE is located off of Gallison Hill Road in Montpelier, Washington County, Vermont. These activities were performed to further assess the degree and extent of PCB and dioxin contamination observed during TSEC's 1998 Preliminary Environmental Site Assessment of the SITE.

During the course of this investigation, thirty-four (34) soil borings were advanced across the SITE in an attempt to characterize the distribution of PCB contamination in soil and beneath the SITE building floor. Two (2) additional samples were collected from riverbank sediments along the Winooski River, and several building material samples were submitted for the determination of PCB and/or dioxin compounds. Three (3) groundwater monitoring wells were also installed as part of this investigation. Samples were not collected, however, due to project time constraints.

Data collected during field investigation activities, and the sample results received from the laboratory indicate that PCBs have impacted soils at numerous sample locations, with the highest concentrations reported in the far eastern portion of the SITE, and immediately west of the SITE building.

Based on the information obtained by TSEC to date, we are recommending that additional samples be collected along the eastern property boundary, and in the vicinity of the former front transformer storage area. Groundwater samples should also be collected from the three (3) existing monitoring wells. A remedial plan will be developed once sufficient information is obtained regarding the contaminant distribution in the vicinity of the former front transformer storage area and along the western SITE boundary.

Please feel free to contact me with any questions or comments. I can be reached at (802) 654-8663 ext. 104 or via e-mail at *jonb@twinstateenvironmental.com*.

Sincerely,
TWIN STATE ENVIRONMENTAL CORPORATION

Jon Berntsen
Project Manager

cc: Mr. Gerold Noyes, P.E., State of Vermont Sites Management Section

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TWIN STATE ENVIRONMENTAL CORPORATION
Environmental Scientists and Engineers

Phase (check one)	Type (check one)
✓ ***Site Investigation***	☐ Work Scope
☐ Corrective Action Feasibility Investigation	✓ ***Technical Report***
☐ Corrective Action Plan	☐ PCF Reimbursement Request
☐ Corrective Action Summary Report	☐ General Correspondence
☐ Operations & Monitoring Report	

SUPPLEMENTAL SITE INVESTIGATION REPORT
October 26, 1999

Green Mountain Power Corp. Plant #4
Gallison Hill Road
Montpelier, Vermont

SMS Site #98-2562
TSEC Project # 97038

Report Prepared for:

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1.0 INTRODUCTION

This report has been prepared by Twin State Environmental Corporation (TSEC) to present the findings of recent environmental investigation activities conducted at the Green Mountain Power Corporation (GMP) Plant #4 facility (SITE) (SMS Site #98-2562). The SITE is located off of Gallison Hill Road in the eastern end of Montpelier, Washington County, Vermont. Please refer to the attached SITE Location Map and SITE Plan presented as **Figures 1 and 2**, respectively.

The activities contained within this report were conducted following the State of Vermont Sites Management Section (VT SMS) and GMP's approval of TSEC's Environmental Sampling Plan, dated August 30, 1999, which has been presented as **Attachment 1**. The overall goal of this Supplemental SITE Investigation was to characterize the polychlorinated biphenyls (PCB) and dioxin present on-SITE. To attain these goals, the following objectives were developed.

- Determine the degree and extent of PCB contamination in the soils underlying the SITE.
- Calculate the groundwater flow direction, hydraulic gradient, and groundwater flow velocity beneath the SITE.
- Install a groundwater monitoring well network to be utilized for a SITE monitoring program.
- Determine the degree and extent of PCB contamination present in groundwater beneath the SITE.
- Determine the presence or absence of PCB contamination beneath the building.
- Establish whether PCBs and dioxins are present in the SITE building materials.
- Evaluate the potential for off SITE migration of PCBs and dioxins; and,
- Determine the outfall locations of the floor drains that originate inside the main shop area.

2.0 SITE HISTORY

Information provided to TSEC by GMP and others familiar with the SITE, indicates that the SITE, approximately 2.0 acres in size, is a former electric generating station and transformer repair and maintenance facility. Electricity was generated by two (2) hydroelectric turbines and one (1) coal fired vertical steam turbine. The facility has not been used for the generation of electricity since the late 1960's, and has been vacant since approximately 1990. Existing structures at the SITE include the remnants of a penstock used to carry water from the dam to the generators, and the former hydroelectric generating station and transformer repair facility. A coal storage shed located along the former railroad line along the north of the SITE was recently removed. The former rail line now serves as a private access road to a hydroelectric dam owned by others.

Past activities conducted at the SITE included transformer repair and upgrades, storage of transformer oil (both above and below grade), storage of transformers, transformer oil filtering operations, and the probable spreading of oil for dust suppression. Some large cast iron transformers, known as Delta 4160's (Δ-4160's) were stored on the eastern portion of the SITE. Leaks from these cast iron transformers were common. During a fire at the SITE in the mid 1950's, a loading platform, containing transformers, collapsed. Transformers and associated equipment were on the platform when it collapsed and the release of transformer oil may have occurred. The conditions likely present during the fire, combined with the materials known or suspected to be present, could possibly have led to the formation of dioxins and dioxin-like compounds.

3.0 PREVIOUS INVESTIGATION

In 1998, TSEC conducted a *Preliminary Environmental SITE Assessment* (P-ESA) of the Plant #4 facility on behalf of GMP. The purpose of the investigation was to determine the presence or absence of poly-aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in the SITE soils and building materials. Based upon the SITE history, namely the fire that occurred in the 1950's adjacent to the former loading dock, and the data obtained during initial sampling activities, TSEC recommended that additional sampling be conducted for dioxin compounds.

A total of nine (9) composite soil samples and twelve (12) wipe samples were collected from the SITE between June 4 and 5, 1998. Soil samples were collected at depths ranging from zero (0) to eighteen (18) inches below ground surface (bgs), and the wipe samples were collected from areas on the surface of the building floors and walls. Samples were submitted to Endyne, Inc. of Williston, Vermont for laboratory analysis via US EPA Method 8080 for PCBs and via US EPA Method 8270 for PAHs.

After a review of the results of the PCB and PAH analyses, TSEC collected two (2) samples for dioxin analysis. One (1) sample was collected from the soils beneath the former loading dock; the other was collected from the brick wall material approximately ten (10) ft above the former loading dock. These samples were submitted to Paradigm Analytical Laboratories of Wilmington, North Carolina for dioxin/furan analysis via US EPA Method 8290.

PCB compounds, PAH compounds and dioxins all were detected in the samples collected from the SITE. No concentration of individual PAH compounds or dioxins were found to be above the limits set by the U.S. Environmental Protection Agency (EPA) Region 3 Risk Based Concentrations (RBCs) for industrial sites. Concentrations of PCB compounds were found to be above the EPA standards for residential sites (320 micrograms per kilogram [µg/kg]) at five (5) sample locations; and at concentrations above the industrial site standard of 2,900 µg/kg at three (3) of the five (5) locations.

- Samples were exported!

4.0 CONTAMINANTS OF CONCERN

Considering previous investigations and information pertaining to the SITE history, the primary contaminants of concern (coc) identified at the SITE are PCBs and dioxins. PCBs are a group of fat-soluble organic compounds that break down very slowly in the environment. Dioxin is a generic term for both dioxins and furans, and refers to a broad family of chemicals that can be present following the high temperature combustion of PCB compounds.

PCBs were common components in hydraulic fluids, lubricants, heat transfer fluids, and insecticides. PCBs were primarily manufactured as dielectric fluid for transformers and capacitors because of their ability to absorb heat, low flammability, low electrical conductivity, and favorable dielectric constant.

5.0 SCOPE OF WORK

During the P-ESA, TSEC identified several areas of concern (AOC's) at the SITE that exhibited elevated levels of PCBs in soil (i.e.- concentrations of PCBs in soils above the US EPA Region 3 Risk Based Concentrations [RBC] for industrial sites). These areas include the former loading dock (***AOC-1***), the location of the former oil storage tank (***AOC-2***), and the former rear transformer storage area (***AOC-3***). In addition to these locations, the former front transformer storage area (***AOC-4***) also contained concentrations of PCBs in soils above the residential cleanup criteria established by the US EPA RBCs. Other areas targeted for sampling during this investigation include two (2) areas beneath the concrete slab floor of the SITE building, the former oil storage tank top, and the building materials in the eastern portion of the SITE building. In order to further define the degree and extent of PCB contamination at the SITE, and to accomplish the goals stated in **Section 1.0**, the following scope of work was performed (Note – locations of samples are presented on **Figures 2** and **3**, and are described in detail in **Table 1**):

- Preparation of a SITE specific health and safety plan that conforms to OSHA 40 CFR 1910.120.

- Clearance of SITE and vicinity for underground utilities by contacting DIG SAFE (Clearance ID# 19993605572 was obtained for work completed from September 3 through October 3, 1999, and Clearance ID# 19994006123 was obtained for work conducted between October 1 and October 31, 1999).

- Collection of two (2) soil samples from beneath the SITE building slab in areas where suspected releases of PCB oil have occurred and where the integrity of the floor slab is compromised by cracks and fissures. These samples were submitted for laboratory analysis via US EPA Method 8082 for PCBs.

- Collection of two (2) building material samples from the east wall of the building in the vicinity of the former loading dock that reportedly caught fire in the 1950's. These samples were submitted for analysis via US EPA Method 8290 for dioxins/furans.

- Collection of one (1) composite sample from the former oil tank cover for laboratory analysis via US EPA Method 8082 for PCBs.

- Determination of the discharge location of the two (2) floor drains in the SITE building.

- Advancement of ten (10) soil borings using Geoprobe® Direct Push technology in the vicinity of the former rear loading dock and former oil storage tank. Continuous soil samples were collected, logged, and field screened for the presence of volatile organic compounds (VOCs) using a PID equipped with a 10.6 eV lamp. A total of eight (8) samples were submitted from these borings for laboratory analysis via US EPA Method 8082 for PCBs.

- Advancement of twenty (20) soil borings using Geoprobe® Direct Push technology in the former rear transformer storage area. Continuous soil samples were collected, and logged for

lithology. A total of twenty (20) samples were submitted from these borings for laboratory analysis via US EPA Method 8082 for PCBs.

- Advancement of two (2) soil borings using Geoprobe® Direct Push technology in the vicinity of the former front transformer area. Two (2) samples were submitted from these borings for laboratory analysis via US EPA Method 8082 for PCBs.

- Collection of two (2) sediment samples from along the bank of the Winooski River for laboratory analysis via US EPA Method 8082 for PCBs. One (1) sample was collected from beneath the location of the floor drain outfall; one (1) sample was collected from directly downgradient of the area with the highest documented PCB concentrations.

- Completion of three (3) soil borings as groundwater monitoring wells using 1-inch diameter PVC well materials. These wells were developed in accordance with TSEC's standard operating procedures following installation.

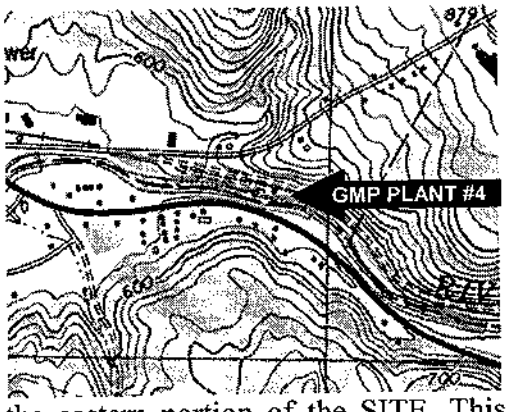
- Completion of a receptor assessment that determined the potential for the PCB contamination to affect nearby building basements, surface water bodies, drinking water wells, etc.

- Completion of an updated SITE plan.

- Collection of depth to groundwater measurements from SITE groundwater monitoring wells for the calculation of groundwater flow characteristics.

- Preparation of this summary report.

6.0 SITE INFORMATION AND REGIONAL SURVEY



SITE Owner: Green Mountain Power Corporation
Address: Gallison Hill Road
Montpelier, Vermont
Size: Lot: 2.0 Acres ±
Structure: 60' x 50'(3,000 ft^2)
Lat:/Long: 44°14'30" N 72°32'5" W
Utilities: *Electricity* - Overhead Connection
Telephone - None
Water - None
Sewer - None

Structures: One (1) main SITE structure exists on the eastern portion of the SITE. This structure, approximately 3,000 ft^2, is constructed of wood framing with brick walls. The interior floor is poured concrete. The former penstock discharge and tailrace is attached to the western portion of the structure. An abandoned penstock is situated along the southern border of the SITE.

The SITE is located atop a river terrace, approximately 20 ft ± above the existing riverbed. The topography of the SITE is relatively flat from east to west, and slopes gently to the south to the riverbank. To the north and east there is an earthen berm that rises approximately 6 to 8 ft above SITE grade. Immediately to the south of the SITE, the topography drops steeply to the Winooski River, below. The SITE may be within the 100 year floodplain of the river.

Area properties are a mix of residential, agricultural, and commercial lands. The Winooski River bounds the SITE to the south; unnamed brooks border the SITE to the east and west; and, a private access road borders the SITE to the north. The other properties in the SITE vicinity consist of a car dealership (Twin City Subaru) across the Winooski River to the southwest, a sports/event arena to the north, and wooded land to the northeast. All residential properties in the SITE vicinity are either well upgradient or across the Winooski River.

Other than the GMP SITE (SMS Site #98-2562) there is one (1) other facility listed on the active hazardous waste site list with the VT SMS that have had documented releases of oil or hazardous material and are located within ½-mile of the SITE.

SITE Name	SITE Address	SMS Site #
Farrell Distributors	Gallison Hill Road – Montpelier	#92-1257

Source: State of Vermont Sites Management Section – Second Quarter Hazardous Sites Listing –July 1999.

Based on a review of this site, its location, and the nature of the contaminants present it does not appear as though it will have a negative impact on the GMP SITE.

7.0 SITE SAMPLING ACTIVITIES AND RESULTS

TSEC developed a SITE sampling program to gather data and assess the SITE for the presence of PCB contamination. This program was initiated on September 8, 1999. Sampling locations were selected based on the findings of TSEC's 1998 P-ESA. Additional locations were identified following the preliminary assessment of PCB analytical data.

The methods used to collect the samples were presented in TSEC's August 30, 1999 Environmental Sampling Plan that was submitted to GMP and the VT SMS. A copy of the plan has also been included as **Attachment 1**.

The sample locations are described in **Table 1** and are presented on **Figures 2** and **3**. All laboratory analyses of samples were conducted via published US EPA methodologies. Samples collected for PCB analysis were submitted to ChemServe Environmental Analysts, Inc. (ChemServe) of Milford, New Hampshire for analysis via US EPA Method 8082. Samples collected for dioxin/furan analyses were submitted to Paradigm Analytical Laboratories, Inc. (Paradigm) of Wilmington, North Carolina for analysis via US EPA Method 8290. The complete laboratory analytical packages received from ChemServe and Paradigm are presented as **Attachments 2** and **3**, respectively.

7.1 Building Material Sampling and Results

7.1.1 Core Sampling

During the P-ESA, TSEC identified several cracks in the concrete floor within the SITE building. Due to the location of these cracks and the potential for these features to act as a preferential pathway for contaminant migration to the sub-slab soils, TSEC recommended coring through the floor at two (2) locations (in the former oil room and in the former drum storage area). On September 8, 1999, TSEC collected two (2) soil samples from beneath the building floor slab. See **Figure 3**, Building Sample Locations for reference.

To access the soils beneath the building slab, TSEC used an electric concrete core drill to open a 3½-inch diameter hole through the concrete slab. Upon removal of the concrete core, Geoprobe® tools were advanced using a "slam bar." Soil borings were advanced to 2 ft below slab surface in both the former oil room (OR-2; 0-2 ft) and in the former drum storage area (DS-1; 0-2 ft). One (1) soil sample from each boring was placed into a laboratory supplied glass sample jar and placed into a cooler with ice. Samples were submitted under chain of custody to ChemServe for laboratory analysis of PCBs via US EPA Method 8082.

7.1.2 Former Oil Tank Sampling

A former concrete holding tank, utilized to store used transformer oil generated during maintenance procedures, was located adjacent to the former loading dock on the east side of the building. The top of the tank was constructed of concrete with a steel cover, and is currently located approximately 175 ft east of the SITE building along the riverbank (see **Appendix A** – SITE Photographs and **Figure 2**, SITE Plan). The tank top measures seven (7) feet by seven (7) feet and is approximately two (2) feet high. The inside is sloped to a low point, where there is a two (2) inch diameter drain with metal mesh filter screen.

Due to the porous nature of the concrete, and the likelihood of oil containing PCBs coming into contact with the tank, one composite sample was collected from the sidewalls and bottom of the tank using a geologists rock hammer. The concrete chips were placed into a laboratory supplied glass jar and placed into a cooler with ice. The sample was submitted to ChemServe under chain of custody for analysis of PCBs via US EPA Method 8082.

7.1.3 Building Material Sampling

During the P-ESA, a sample collected from the building materials on the outside of the building above the former loading dock, tested positive for dioxin/furan compounds. Following further discussion of the events surrounding the fire that reportedly occurred in the 1950's it was determined that the fire burned inside the building along the eastern wall. TSEC was requested by GMP to collect two (2) additional samples from the building interior wall and around the sliding rear door.

Two (2) samples were collected on September 8, 1999. Using a geologist's rock hammer, pieces of building materials were knocked loose from the locations specified above. Samples were placed into a laboratory supplied glass sample jar, labeled Doorway-1 and East Wall, respectively, and placed into a

cooler with ice. Samples were submitted under chain of custody to Paradigm Analytical for analysis of dioxins/furans via US EPA Method 8290.

7.1.4 Laboratory Analytical Results

Analytical results received from ChemServe indicate that total PCBs are present in the sample collected from beneath the former drum storage area (DS-1; 0-2 ft) at a concentration of 240 micrograms per kilogram (µg/kg). The sample submitted from beneath the oil room (OR-1; 0-2 ft) did not contain any detectable concentrations of PCB compounds. The sample collected from the oil tank top (OT-1) contains total PCBs at a concentration of 3,200 µg/kg. The complete PCB analytical data package received by ChemServe is presented as **Attachment 2,** has been summarized on **Table 2,** and is presented graphically on **Figures 4** and **5**. The PCB congeners present in these samples consist of Arochlor 1254 and Arochlor 1260.

The results of the dioxin/furan analyses conducted by Paradigm indicate that these compounds are present in the SITE building materials. The dioxin/furan data is summarized in **Table 3** and is presented as **Attachment 3**.

Concentrations of total dioxin/furan compounds were detected at 13.1 nanograms per kilogram (ng/kg) [parts per trillion] in the sample collected from adjacent to the rear door (Doorway-1) and at 0.822 ng/kg in the East Wall sample. These concentrations are reported as a Toxic Equivalent Factor (TEQ) concentration, which indicates the concentration to total dibenzo-p-dioxins and dibenzofurans normalized to the most toxic dioxin compound, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). The TEQ concentration of dioxin/furan compounds in the Doorway-1 sample is above the US EPA Risk Based Concentration for 2,3,7,8-TCDD for residential properties (4.3 ng/kg), but is below the concentration for industrial properties (38 ng/kg).

7.2 Sediment Sampling Activities and Results

7.2.1 Sample Collection

Due to the locations of the rear transformer storage area and the floor drain outfall (see **Section 8.0**), TSEC collected two (2) sediment samples from the bank of the Winooski River. The locations of the samples are indicated on **Figure 2**. These samples were collected using a solid stem hand auger advanced to a depth of approximately 6-inches below ground surface. Recovered samples were placed into a laboratory supplied glass jar and labeled SS-1 (floor drain outfall) and SS-2 (downgradient of rear transformer storage area), and were placed into a cooler with ice. Samples were submitted under chain of custody to ChemServe for laboratory analysis of PCBs via US EPA Method 8082.

7.2.2 Results

Data returned from ChemServe indicates that neither sediment sample contained PCBs at or above laboratory instrumentation detection limits (DL's). Additionally, the DL's were below the US EPA RBC for industrial and residential soils.

7.3 Soil Sampling Activities and Results

Soil samples were collected at the SITE on September 8, September 9, and October 5, 1999. These samples were obtained using TSEC's Geoprobe® direct push soil sampling unit. Samples were collected from the locations depicted on SITE Plan, **Figure 2**, and as described in Summary of Environmental Sample Locations, **Table 1**.

7.3.1 Rear Loading Dock (AOC-1) and Former Oil Tank (AOC-2)

The rear loading dock was formerly attached to the eastern end of the SITE building. This wooden platform measured approximately thirty (30) feet by fifteen (15) feet and was approximately six (6) feet off of the ground. Transformers and other equipment were stored on this structure before they were brought inside the building for service. During the 1950's, this loading dock caught fire and fell to the ground. Equipment on the loading dock, presumably containing PCB oil, also fell to the ground and caught fire.

Based on this information, TSEC collected soil samples with the Geoprobe® from ten (10) biased sampling locations (LD-1 through LD-10) on September 8, 1999. These locations were selected to quantify PCB concentrations against the building (LD-1, LD-3, LD-6,and LD-8), at the eastern edge of the former loading dock (LD-2, LD-4, LD-7, LD-10), and at a location approximately five (5) ft east of the former loading dock (LD-5, LD-8). The sampling locations are presented on **Figures 2** and **3**.

Continuous samples were collected until refusal was encountered. Boring depths ranged from 3.0 ft bgs (LD-3) to 6.5 ft bgs (LD-6). Eight (8) soil samples (identified as LD-2, 0-4 ft; LD-3, 0-3 ft; LD-4, 0-4 ft; LD-4, 4-6 ft; LD-5, 0-4 ft; LD-7, 0-4 ft; LD-8, 0-4 ft; and, LD-9, 4-8 ft) were collected from these borings and submitted for laboratory analysis of PCBs via US EPA Method 8082.

7.3.2 Rear Storage Area (AOC-3)

TSEC established an unbiased sampling grid centered on the eastern portion of the SITE, within the former rear transformer storage area (see **Figure 2**). This portion of the SITE was used for the storage of transformers arriving at the SITE for service.

Sample locations were placed at 20 ft intervals. Continuous samples were collected with the Geoprobe® until either the groundwater table was encountered, or the boring was terminated due to refusal. Samples for laboratory analysis were selected based on visual and olfactory observations of the collected samples, and on the data obtained during previous investigations. Samples RS-1 through RS-16 were collected on September 9, 1999.

During the initial sampling activities, stressed vegetation was observed within the overgrown portions of the SITE to the north and east of the sample location RS-16. TSEC discussed this issue with GMP, and decided to return to the SITE after the vegetation within these areas had been trimmed enough to allow access for the Geoprobe®. Additional samples (RS-17 through RS-20) were collected on October 5, 1999. Boring depths within the rear portion of the site ranged from 2.0 ft bgs (RS-15) to 12.0 ft (RS-10). A total of twenty (20) samples from these soil borings were submitted to ChemServe for laboratory analysis of PCBs via US EPA Method 8082.

7.3.3 Front Transformer Storage Area (AOC-4)

Two (2) sample locations were selected in the front portion of the SITE, approximately twenty (20) feet south of the SITE access road (see **Figure 2**). This portion of the SITE was used to store transformers after the transformers had been serviced, prior to leaving the SITE.

One (1) sample from each boring was submitted to ChemServe for analysis of PCBs via US EPA Method 8082. These samples (FS-1; 0-4 ft and FS-2; 0-4 ft) were collected in order to determine where the elevated levels of PCBs detected in the composite sample collected from this area during the P-ESA might be attributed.

7.3.4 Analytical Results

The complete PCB analytical data package received by ChemServe is presented as **Attachment 2** and has been summarized on **Table 2**. Data has been presented graphically on **Figures 4** and **5**.

Rear Loading Dock and Oil Tank

Analytical results received from ChemServe indicate that PCBs are present in six (6) of the eight (8) samples collected from the rear loading dock and former oil tank location. Concentrations of total PCBs in these samples range from 9.5 µg/kg (LD-9; 4-8 ft) to 3,050 µg/kg (LD-2; 0-4 ft). PCBs were not present above instrument DL's in the sample collected at LD-4; 4-6 ft and LD-7; 0-4 ft. The PCB congeners identified in the samples collected consist of Arochlor 1242, Arochlor 1254, and Arochlor 1260.

Rear Transformer Storage Area

Total PCBs were detected in thirteen (13) of the twenty (20) samples collected from the rear transformer storage area at concentrations ranging from 1.8 µg/kg (RS-2; 4-6 ft) to 610,000 µg/kg (RS-19; 0-3 ft). The PCB congeners detected were Arochlor 1254 and Arochlor 1260.

The majority of the high levels of contamination are present in two (2) areas in the eastern half of the rear transformer storage area. These areas cover approximately 300 ft^2 in the vicinity of RS-19 and approximately 1,200 ft^2 in the vicinity of RS-16, RS-18, and RS-20. In both locations, the depth to refusal was relatively shallow (<7 ft bgs). The larger area is bounded to the north and east by an earthen berm approximately six (6) to eight (8) feet higher than surrounding grade. To the east of this area is an unnamed brook on the opposite side of the berm. Approximately 20 ft to the south, lies the Winooski River.

Front Transformer Storage Area

PCBs were detected in both soil samples collected from this area. Sample FS-1; 0-4 ft contained total PCBs at a concentration of 20,000 µg/kg, and FS-2; 0-4 ft contained total PCBs at a concentration of 110,000 µg/kg. In both samples, the PCB congener present was Arochlor 1254.

8.0 FLOOR DRAIN ORIENTATION AND OUTFALL LOCATION

Two (2) floor drains have been observed in the SITE building. These are located in the main room, beneath the second story loft (see **Figure 3**). Due to the potential for a release of PCB containing materials in the former drum storage area, and the potential migration of PCB containing materials to these drains, TSEC recommended determining the configuration and ultimate discharge location of these drains.

Upon completion of the building material sampling, TSEC used gravimetric surveying techniques to trace the location of the floor drains inside the SITE building. This method detects the difference in gravitational force present by a buried object or hollow conduit. TSEC utilizes two (2) steel welding rods approximately 12-inches in length, with the bottom two (2) inches bent at a 90° angle. The rods are oriented parallel to the ground and to each other, with the long ends facing away from the operator. As the operator traverses a pre-determined survey grid, the rods will bend towards each other when there is a difference in gravity (either positive or negative). The location of the gravity differences are noted, and used to trace the subsurface layout of the underground anomaly.

By using this method, TSEC was able to trace out the orientations of the two (2) floor drains, ultimately following them to their discharge location along the riverbank. Their locations have been plotted on **Figure 3**, Building Sample Locations.

9.0 SITE GEOLOGY

A summary of the predominant geological units encountered during drilling activities is presented on **Table 1** and in **Appendix B**, Monitoring Well Logs. Generally, the unconsolidated surficial materials are comprised of coarser sand and gravel fill materials overlying silty sediments deposited by the Winooski River. Refusal, a good indication of bedrock, was encountered during this investigation at depths ranging from 2.0 ft to greater than 12.0 ft bgs. For a more detailed description of geological units, see Boring Logs, **Appendix B**.

Published sources indicate that surficial geologic materials that underlie the SITE consist of recent alluvium and silt, silty clay and clay that are representative of lake bottom sediments from glacial Lake Vermont[1]. Reports available concerning the bedrock underlying the SITE indicated that material present consist of the Silurian age (417-443 million years old) dark gray phyllite and schist with some interbedded slate belonging to the Waits River[2] formation.

10.0 AQUIFER CHARACTERISTICS

10.1 Monitoring Well Installation

Three (3) groundwater monitoring wells were installed at the SITE during the soil boring program. These wells were installed into soil borings RS-3 (MW-1), RS-18 (MW-2), and RS-20 (MW-3) by

[1] Doll, C.G., editor, 1970, Surficial Geologic Map of Vermont, VT Geological Survey, SGL.
[2] Konig, Ronald H., 1961, Geology of the Plainfield Quadrangle, Vermont, Vermont Geol. Survey Bulletin No. 16.

placing a 1-inch diameter schedule 40 polyvinylchloride (PVC) monitoring well with a 0.010-inch machine slotted screen into the open borehole. The annular space between the well screen and the borehole wall was filled by a clean sand filter pack. A 1-inch diameter PVC riser was placed above the screen, and a bentonite seal was placed around the riser to prevent surface infiltration. Wells were fitted with an expansion plug to avoid surface infiltration to the aquifer. All wells were left with a stick-up riser.

Following installation of the new monitoring wells, each monitoring well that yielded sufficient groundwater was developed using a peristaltic pump to remove fine particulates introduced into the formation during drilling and/or installation. 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). Development water was discharged directly to the ground surface.

Further details of the well installations are presented in **Appendix B–Boring Logs**.

10.2 Water Table Elevation

On October 5, 1999, all three (3) groundwater monitoring wells were located and accessed for fluid level measurements. Depth to groundwater in the three (3) monitoring wells was measured between 1.31 ft bgs (MW-2) and 4.84 ft bgs (MW-1) [Note: elevations corrected for riser stick-up]. A full analysis of groundwater elevation data is presented in **Table 4**, Summary of Groundwater Elevations – October 5, 1999.

10.3 Site Hydrogeology

A groundwater elevation map has been prepared from the October 5, 1999 groundwater elevation data and is presented as **Figure 6** – Groundwater Elevation Plan. The groundwater flow direction was calculated based on the three data points to be to the southwest, towards the Winooski River. The horizontal hydraulic gradient (*i*) was measured to be 0.029 ft/ft between monitoring wells MW-1 and MW-2.

The groundwater encountered during the soil boring program is present within the coarser overburden sands and gravel. These materials were dry during the September 1999 SITE sampling activities as a result of the summer drought. Following sufficient rains occurring during late September, the water table was present at approximately 1.3 ft bgs in the vicinity of MW-2, and at approximately 4.8 ft bgs at MW-1.

Based on the measured hydraulic gradient (i), the published hydraulic conductivity (k) for silty sands and fine sands of 0.03 feet per day (ft/d) to 3 ft/d (Fetter[3]), and the assumed porosity value of 30% for this SITE (η), the apparent groundwater flow velocity beneath the SITE can be calculated using the following equation:

Equation: $$V_{gw} = \frac{ki}{\eta}.$$

[3] Fetter, C.W., 1994, Applied Hydrogeology – 3rd Edition. Englewood Cliffs, NJ: Prentice Hall. 691p.

The calculated apparent groundwater velocity through the upper four to six feet of the aquifer, according to the above equation, ranges from $2.9x10^{-3}$ ft/d to $2.9x10^{-1}$ ft/d (*1.05 ft/yr* to *105 ft/yr*).

A graphical interpretation of the groundwater flow direction is presented on the Groundwater Contour Plan provided as **Figure 6**.

10.4 Groundwater Sampling Activities

Due to project time constraints, groundwater samples were not collected during this investigation.

11.0 SITE SURVEY AND RECEPTOR EVALUATION

11.1 SITE Survey

A Topcon AT-G6 auto level was used to perform a stadia survey to identify the location and relative elevations of key SITE features. The collected data was used to update the SITE Plan (**Figure 2**) and obtain top of PVC riser elevations necessary to calculate water table elevations.

11.2 Receptor Evaluation

During field activities conducted for this project, sensitive receptors in the SITE vicinity were identified and assessed for the likelihood of impact by PCB contamination. These included surface water receptors, groundwater supply wells, downgradient basements, breathing zones of the SITE building, and subsurface utility corridors from the on-SITE contamination.

11.2.1 Surface Water Receptors

Surface water features identified within a ½-mile radius of the SITE include two (2) unnamed brooks bordering the SITE to the east and west, the Winooski River. Sediment samples collected during this program do not contain detectable concentrations of PCBs within the Winooski River. However, this is not an indication that the Winooski River has not been impacted by PCBs. Based on its proximity to the SITE, it can be assumed that the river has been the recipient of PCB contamination from the SITE.

11.2.2 Drinking Water Receptors

There are no residential supply wells located immediately downgradient of the SITE. There may be several residential supply wells upgradient of the SITE, however the identification and sampling of area wells was not part of the scope of work for this project.

11.2.3 Other Receptors

Other potential receptors identified include the indoor air quality of the SITE building, wildlife that live in the river, and boroughing animals that live on SITE. PCBs are known to be absorbed in the fatty tissues of organisms, and they bioaccumulate up the food chain. This ultimately results in the

exposure to mammals through both direct exposure to the contamination on SITE, and through the consumption of PCB-containing foods such as fish caught in the Winooski River.

12.0 DISCUSSION OF REMEDIAL GOALS

12.1 PCB Contaminated Soils

The State of Vermont does not currently enforce any state developed cleanup guidelines for PCB contaminated soils. Often, the US EPA Region 3 Risk Based Concentration (RBC) Tables are referenced for cleanup goal concentrations. The table, most recently updated in April 1999, is primarily used for SITE screening purposes during baseline environmental assessments. The values referred to in this report are compared to the risk based cleanup goals for soil at both residential (320 µg/kg) and industrial sites (2,300 µg/kg).

The RBC table does not constitute regulation or guidance, and should not be viewed as a substitute for a SITE-specific risk assessment. For sites where a single medium is contaminated, a single contaminant contributes nearly all the health risk, and the exposure scenarios and assumptions used in the RBC table are appropriate for the SITE, RBC's would suffice as no-action levels or cleanup goals.

12.2 Dioxin/Furan Contaminated Solids

The State of Vermont does not currently enforce a state developed guideline for dioxin contaminated soils. The risk based guidelines for exposure must be developed on a site-specific basis and must take into account population, exposure routes, and the use of the SITE.

If the reported values are compared to the RBC table value for 2,3,7,8-TCDD in soils at an industrial SITE, then an acceptable TEQ value for dioxins in soils at the SITE is 43 ng/kg. Residential criteria is set at 3.8 ng/kg.

12.3 40 CFR 761 Regulations

During the SITE meeting between GMP, TSEC, and the VT SMS, it was mentioned that clean-up standards for the SITE will be dictated by Federal Guidelines, and by the future use of the SITE. The Federal Guideline that applies to this particular SITE is 40 CFR 761.61, which provides cleanup and disposal options for PCB remediation waste. The following highlights the information presented in that guideline.

Cleanup Levels and Restrictions

The SITE must be classified as either a high occupancy area or a low occupancy area prior to the initiation of a cleanup program. A ***high occupancy area*** is an area where occupancy by an individual not wearing personal protective equipment equals or exceeds 6.7 hours per week, where bulk waste is present. This may include environments such as residential areas, schools, 40-hour per week workstations, etc. A ***low occupancy area*** refers to any area where an individual's exposure is limited to less than 6.7 hours per week.

1000 mg/kg

The cleanup level for bulk PCB remediation waste in a high occupancy area is ≤1 part per million (ppm) with no further conditions. In areas where bulk PCB remediation waste is present between >1 ppm and ≤10 ppm in a high occupancy area, a cap shall be constructed to limit exposure to the PCB waste.

The cleanup level established for a low occupancy area under 40 CFR 761.61 is ≤25 ppm with no further conditions.

Bulk PCB remediation waste may remain at a SITE at concentrations >25 ppm and ≤50 ppm if the SITE is secured by a fence and marked with a sign including the mark M_L (indicating PCB contaminated). Concentrations of >25 ppm to ≤100 ppm may remain at a SITE if a cap is constructed meeting the requirements described below.

Bulk PCB remediation waste with a PCB concentration of ≥50 ppm shall be disposed of in a hazardous waste landfill permitted by the US EPA under Section 3004 of RCRA.

Change in the Land Use for a Cleanup SITE

If there is a proposed change in the land use for a SITE (i.e.-change from low occupancy to high occupancy), the owner of the area must meet the cleanup guidelines for the proposed land use.

Capping Requirements and Deed Restrictions

If a cap is constructed to cover the PCB contaminated areas in order to minimize human exposure, prevent infiltration of water, or inhibit erosion, it must be made of asphalt, concrete, or compacted soil. Asphalt and concrete caps must have a minimum uniform thickness of six (6) inches; soil caps must have a minimum uniform thickness of ten (10) inches. These caps should be of sufficient strength to maintain integrity during the normal use of the cap environment.

If a remediation cap is constructed, or a fence is installed to limit access to the SITE, the SITE owner must record a notation on the deed to the property or on some other instrument which is normally examined during a title search, within sixty (60) days of the completion of SITE activities. This notation should indicate:

- that the land has been used for PCB remediation waste,
- that the SITE is restricted to use as a low occupancy area,
- that there is a fence or cap present that must be maintained, and,
- the applicable cleanup levels have been left at the SITE.

13.0 CONCLUSIONS

Based on the activities conducted to date, TSEC presents the following conclusions:

- The SITE has historically been used as a hydroelectric generating station until the 1960's and an electrical transformer repair facility until 1990. The SITE has not been actively occupied since 1990.
- The source of the PCB contamination, the former power transformer equipment stored and serviced at the SITE, has been removed.
- A Preliminary Environmental Site Assessment (P-ESA) was conducted by TSEC in 1998 that was designed to determine whether PCBs were present as a result of historical SITE activities. The results of the investigation indicated that there were several locations where levels of PCBs in soil were present at levels exceeding US EPA Risk Based Concentrations (RBC). The data collected during the P-ESA also indicated that SITE building materials had been contaminated by PCBs.
- Two samples conducted during the completion of the P-ESA indicated that low levels of dioxin compounds were present in SITE soils and building materials.
- A SITE sampling plan was developed by TSEC to expand on the information obtained during completion of the P-ESA. This plan was presented to GMP and the VT SMS for review and approval. The sampling program was initiated on September 8, 1999.
- Two (2) soil samples were collected from beneath the concrete slab of the SITE building and analyzed for PCBs via US EPA Method 8082. One (1) sample, collected from the former drum storage area, contained 240 µg/kg of PCBs.
- Two (2) building material samples were collected from the eastern wall of the SITE building, in the vicinity of the former loading dock, for analysis of dioxin/furan compounds via US EPA Method 8290. Data indicates that total dioxins (corrected for toxic equivalency) are present at levels in excess of the US EPA RBC levels for residential use areas, but are below the levels for industrial sites.
- One (1) composite sample was collected from the concrete top to the former oil holding tank and submitted for PCB analysis via US EPA Method 8082. This sample contained total PCBs at a concentration of 3,200 µg/kg, which is above the allowable contaminant levels for non-porous surfaces prescribed by 40 CFR 761.61.
- Two (2) sediment samples were collected from along the banks of the Winooski River. One (1) sample was collected adjacent to the former rear transformer storage area; one (1) sample was collected at the identified location of the outfall for the two (2) floor drains located inside the SITE building. Neither sample contained detectable concentrations of PCBs.
- Ten (10) soil borings were advanced adjacent to the former rear loading dock and former oil holding tank. Eight (8) samples were submitted for laboratory analysis of PCBs, and six (6)

samples contained detectable concentrations of PCBs ranging from 9.5 µg/kg (LD-9; 4-8 ft) to 3,050 µg/kg (LD-2; 0-4 ft). Four (4) samples contained concentrations above the residential levels set by the US EPA RBCs.

- Twenty (20) soil borings were advanced in the former rear transformer storage area, located east of the SITE building. A total of twenty (20) samples were submitted for laboratory analysis of PCBs via US EPA Method 8082. Detected concentrations range from 1.8 µg/kg (RS-2; 0-2 ft) to 610,000 µg/kg (RS-19; 0-3 ft). Five (5) samples contained concentrations in excess of the US EPA RBCs for industrial sites. These samples are all located on the eastern half of the former rear transformer storage area, in an area measuring approximately 1,500 ft^2.

- Two (2) soil samples were advanced in the vicinity of the former front transformer storage area, located west of the SITE building. One (1) sample was collected from each boring and submitted for laboratory analysis of PCBs via US EPA Method 8082. Both samples contained elevated levels of PCBs at concentrations of 20,000 µg/kg (FS-1; 0-4 ft) and 110,000 µg/kg (FS-2; 0-4 ft). Both concentrations exceed the US EPA RBCs for industrial sites.

- Three (3) groundwater monitoring wells were installed at the SITE, into borings RS-3 (MW-1), RS-18 (MW-2), and RS-20 (MW-3). Depth to groundwater ranged from 1.31 ft bgs (at MW-1) to 4.84 ft bgs (at MW-3). Groundwater was calculated to flow to the southwest with a horizontal hydraulic gradient of 0.029 ft/ft.

14.0 RECOMMENDATIONS

Based on the information collected during this and previous investigations, TSEC recommends the following:

- Additional soil samples should be collected from the areas to the north and east of samples RS-18, RS-19, and RS-20 and submitted for analysis of PCBs. These samples would indicate whether the contamination exists to the east of the SITE boundary.

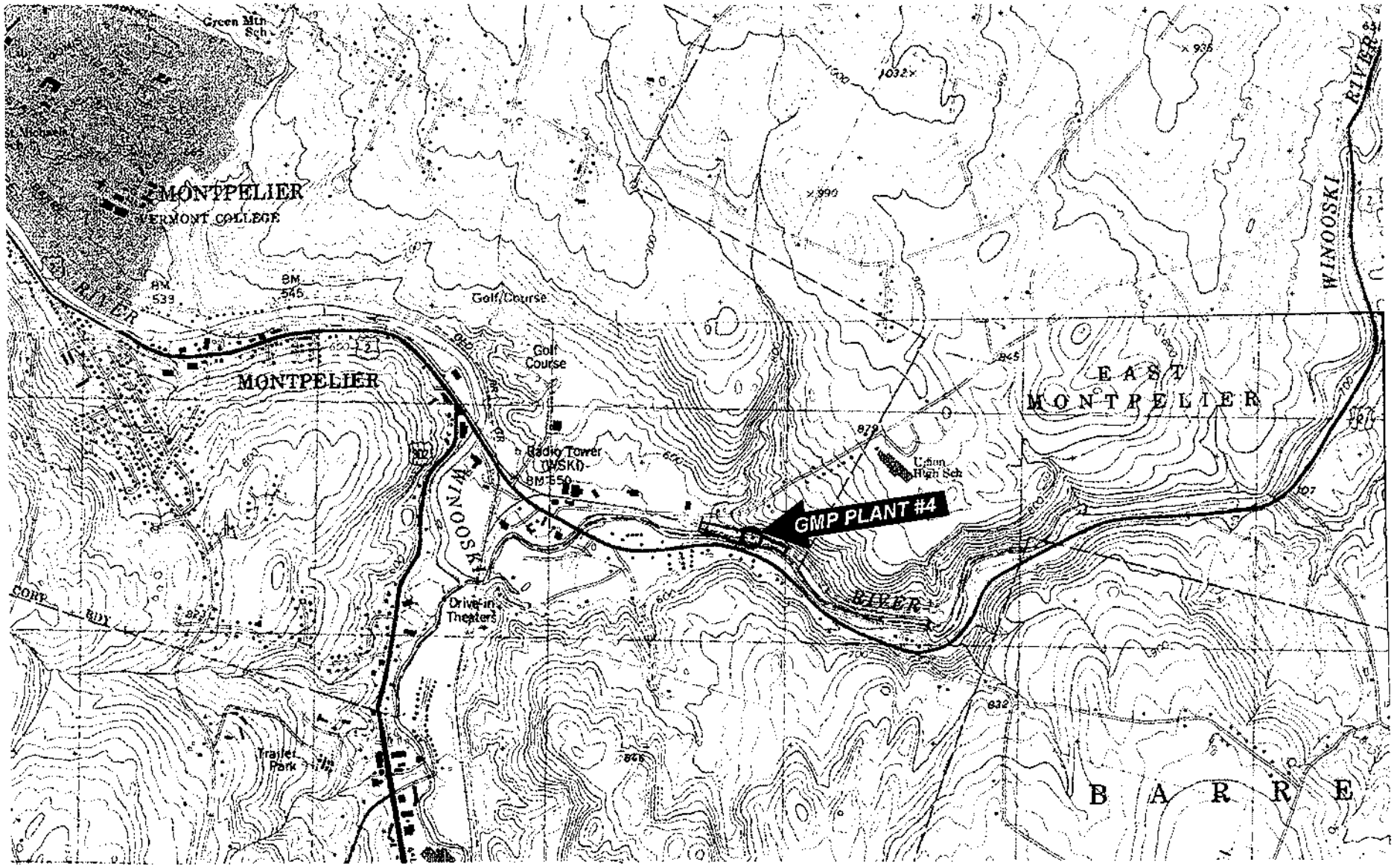
- Further delineation of PCB contamination of the front storage area is necessary. Additional soil samples should be collected from a grid, similar to the rear transformer storage area, and analyzed for PCBs via US EPA Method 8082.

- The three (3) groundwater monitoring wells should be sampled and analyzed for PCBs via US EPA Method 8082. 8260 ? 8270 ?

- An appropriate plan should be developed to address the contamination on SITE. This plan may include the limited excavation and off-site disposal of soils contaminated above 25,000 µg/kg (25 ppm), fencing and marking of the SITE perimeter, and preparing a plan to treat the remainder of the PCB contaminated soils. However, the plan can not be fully developed until a better understanding of the contaminant distribution in the front transformer storage area is obtained.

o sample floor drain sludge / sediment

FIGURES



N
W E
S

Source: USGS 7.5 Minute Topographic Map Series
Barre East, Vermont Quadrangle

0 2000
Scale (in feet) 1"=2,000'

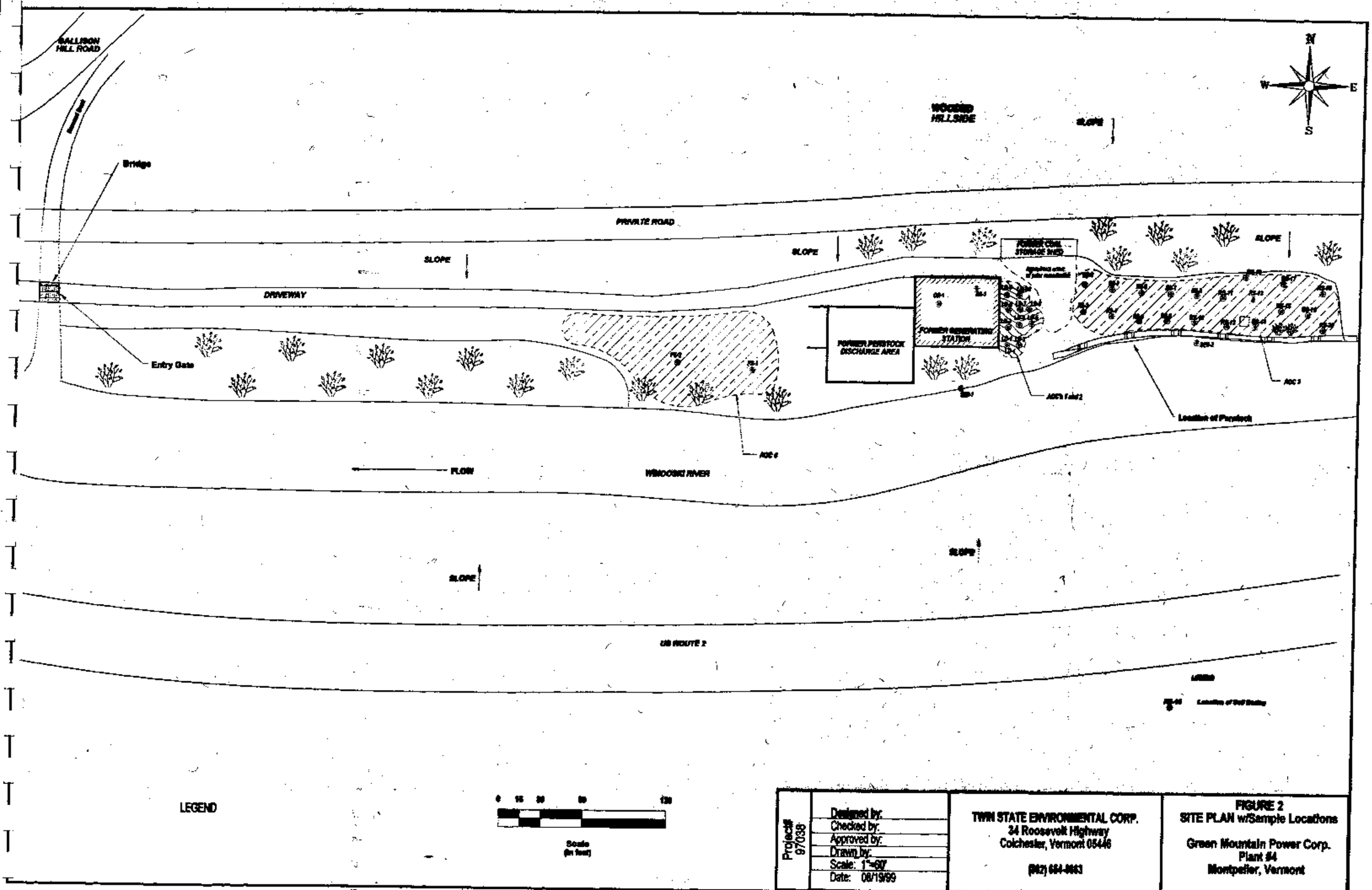
Site Location (center):
Lat: 44°14'30" North
Long: 72°32'5" West

Project No: 97038	
Designed By:	jpb
Checked By:	
Approved By:	
Drawn By:	jpb
Scale:	as shown
Date:	08/19/99

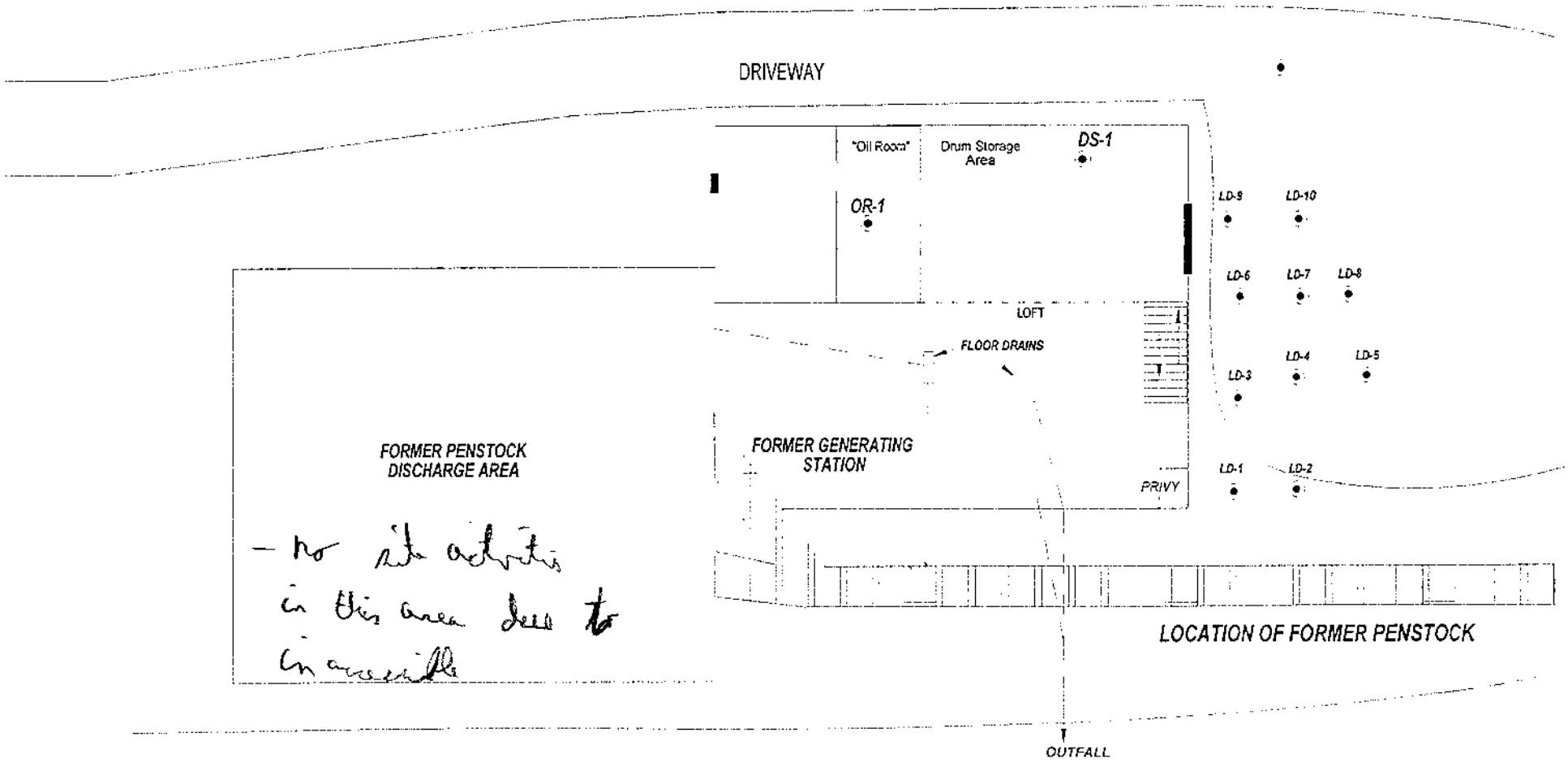
TWIN STATE ENVIRONMENTAL CORP.
34 Roosevelt Highway
Colchester, Vermont 05446
(802) 654-8663

FIGURE 1
SITE LOCATION MAP

Green Mountan Power Corp.
Plant #4
Montpelier, Vermont

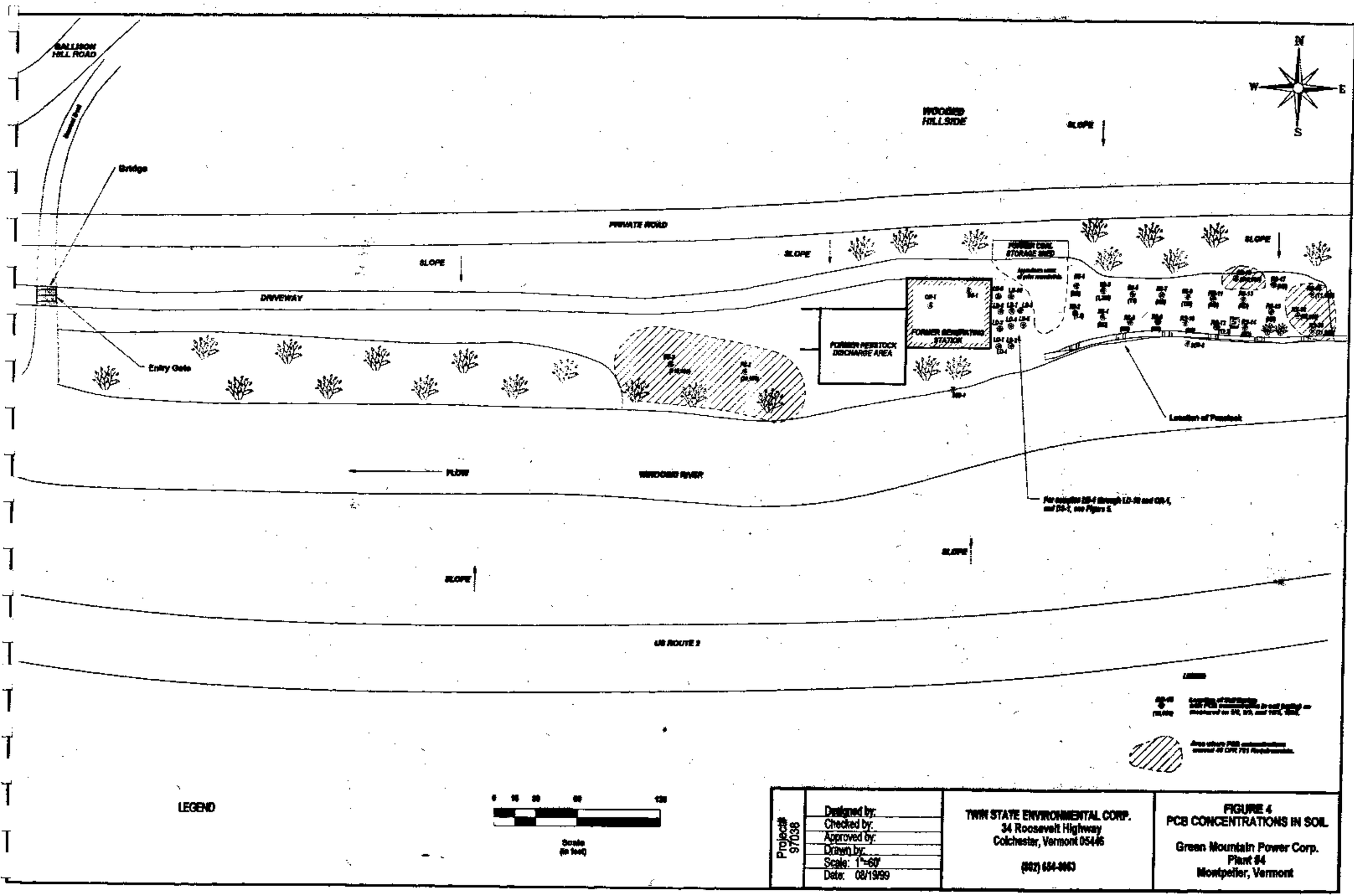


Project# 97038	Designed by: Checked by: Approved by: Drawn by: Scale: 1"=60' Date: 08/19/99	TWIN STATE ENVIRONMENTAL CORP. 34 Roosevelt Highway Colchester, Vermont 05446 (802) 654-9443	FIGURE 2 SITE PLAN w/Sample Locations Green Mountain Power Corp. Plant #4 Montpelier, Vermont



Project No.: 97-038	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: 1" = 20' Date: 10/19/99	TWIN STATE ENVIRONMENTAL CORP. 34 Roosevelt Highway Colchester, Vermont 05446 (802) 654-8663	FIGURE 3 BUILDING SAMPLE LOCATIONS GMP Plant #4 Montpelier, Vermont

jpb:\project\97-038\inside.skd

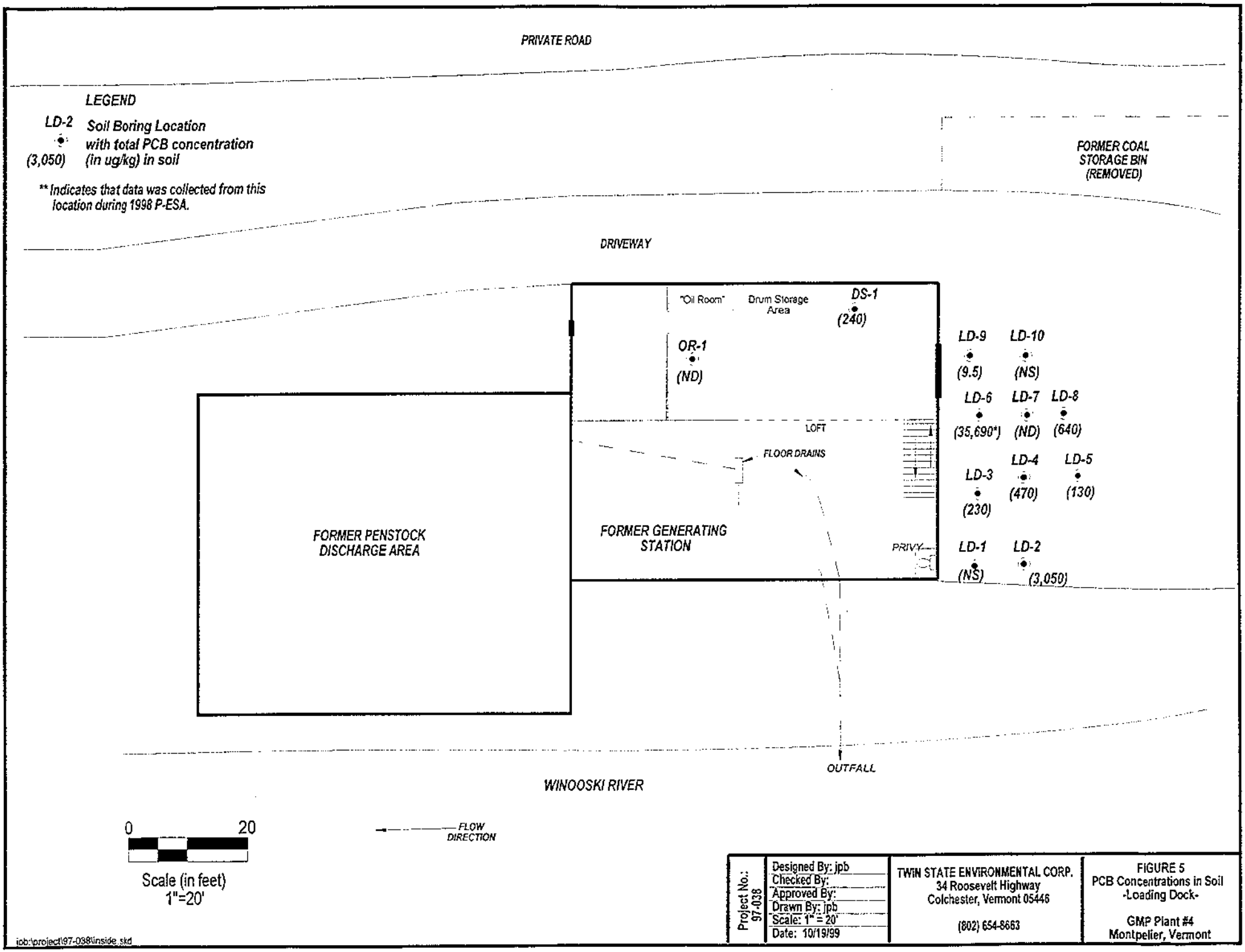


Project# 970138	
Designed by:	
Checked by:	
Approved by:	
Drawn by:	
Scale: 1"=60'	
Date: 08/19/99	

TWIN STATE ENVIRONMENTAL CORP.
34 Roosevelt Highway
Colchester, Vermont 05446
(802) 654-9963

FIGURE 4
PCB CONCENTRATIONS IN SOIL

Green Mountain Power Corp.
Plant #4
Montpelier, Vermont


PRIVATE ROAD
LEGEND
LD-2
Soil Boring Location
(3,050)
with total PCB concentration
(in ug/kg) in soil
** Indicates that data was collected from this location during 1998 P-ESA.
FORMER COAL STORAGE BIN (REMOVED)
DRIVEWAY
"Oil Room"
Drum Storage Area
DS-1
(240)
OR-1
(ND)
LD-9
(9.5)
LD-10
(NS)
LD-6
(35,690*)
LD-7
(ND)
LD-8
(640)
LOFT
FLOOR DRAINS
LD-3
(230)
LD-4
(470)
LD-5
(130)
FORMER PENSTOCK DISCHARGE AREA
FORMER GENERATING STATION
PRIVY
LD-1
(NS)
LD-2
(3,050)
OUTFALL
WINOOSKI RIVER
0
20
Scale (in feet)
1"=20'
FLOW DIRECTION
Project No.: 97-038
Designed By: jpb
Checked By:
Approved By:
Drawn By: jpb
Scale: 1" = 20'
Date: 10/19/99
TWIN STATE ENVIRONMENTAL CORP.
34 Roosevelt Highway
Colchester, Vermont 05446
(802) 654-8663
FIGURE 5
PCB Concentrations in Soil
-Loading Dock-
GMP Plant #4
Montpelier, Vermont
iob:\project\97-038\inside.skd

GALLISON HILL ROAD

Gallison Road

Bridge

Entry Gate

DRIVEWAY

PRIVATE ROAD

SLOPE

SLOPE

WOODED HILLSIDE

SLOPE

FORMER PENSTOCK DISCHARGE AREA

FORMER GENERATING STATION

SLOPE

Location of Penstock

FLOW

WINOOSKI RIVER

SLOPE

SLOPE

US ROUTE 2

N

W

E

S

LEGEND

0 15 30 60 120

Scale (in feet)

Project# 97039	Designed by: Checked by: Approved by: Drawn by: Scale: 1"=60' Date: 08/19/99

TWIN STATE ENVIRONMENTAL CORP.
34 Roosevelt Highway
Colchester, Vermont 05446
(802) 654-9663

FIGURE 6
GROUNDWATER ELEVATION PLAN
October 5, 1999
Green Mountain Power Corp.
Plant #4
Montpelier, Vermont

TABLES

TABLE 1

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Environmental Sample Summary Table

Sample Identification	Depth of Boring (ft bgs)	Location of Sample	Materials Encountered (Description)	Refusal
OR-1*	2.0 ft	Beneath floor in "oil room" of main SITE building.	Concrete floor to 0.75 ft, followed by silty sand and gravel fill material and broken brick fill. Abundant water was present beneath concrete floor.	No
DS-1*	2.0 ft	Beneath floor in "Drum Storage Area" of main SITE building.	Concrete floor to 0.75 ft, followed by silty sand and gravel fill material and broken brick fill. Abundant water was present beneath concrete floor.	No
OT-1*	N/A	Composite sample taken from four sides of former oil tank cover.	Concrete. (Prior to collecting samples, paper wasp nest was irradicated using "Raid" hornet and wasp spray.)	N/A
LD-1	4.5 ft	Adjacent to southeast building corner, in area of former loading dock.	Fine sand, silt, and gravel over miscellaneous fill material and coal clinkers. Mixed sand, silt, and gravel to refusal.	Yes
LD-2*	6.0 ft	Adjacent to LD-1, in area of former rear loading dock.	Tan fine sand to 1.0 ft; silt, clay, rock, and wood fill material to 2.3 ft; tight silty sand to refusal. At 6.0 ft, mixed rock fragments were recovered in core tip.	Yes
LD-3*	3.0 ft	Adjacent to east side of building, 10 ft north of sample LD-1.	Fine silty sand; Tan to 2.0 ft, black from 2.0 to 3.0 ft.	Yes
LD-4*	6.0 ft	Discrete sample collected approximately 10 ft east of LD-3.	Loose silty fine sand with gravel over stiff silt with clay sand and some clinkers. Below clinkers were some mixed layers of silt, iron stained sands, and coarse gravel.	Yes
LD-5*	6.0 ft	Approximately 25 ft to the east of building wall, 18 ft east of LD-3.	Silty sand with gravel to 1.8 ft; mixed sands and gravel to 5.4 ft; tight brown silt and green phyllite schist to refusal at 6.0 ft.	Yes
LD-6	6.5 ft	Advanced adjacent to former oil storage tank location.	Mixed sands and gravel to approximately 4.0 ft; medium sand to refusal at 6.5 ft.	Yes
LD-7*	5.5 ft	Advanced approximately 10 ft east of former oil storage tank.	Sand and gravel to 1.0 ft bgs; coal clinkers to 2.0 ft bgs. From 2 ft to 5.5 ft (refusal), silt was encountered.	Yes

TABLE 1
(continued)

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Environmental Sample Summary Table

Sample Identification	Depth of Boring (ft bgs)	Location of Sample	Materials Encountered (Description)	Refusal
LD-8*	3.5 ft	Advanced approximately 20 ft east of former oil storage tank.	Mixed sand gravel recovered throughout sample core. Material was tan between 0-1 ft, and black from 1-3.5 ft. Sample contained an oil odor.	Yes
LD-9*	5.5 ft	Advanced directly east of rear building door.	Mixed sand, silt, and gravel to 1.0 ft; crushed rock from 1.0-1.2 ft; mixed layers of iron-stained sand and silt to refusal at 5.5 ft. Groundwater was encountered at approximately 5.0 ft.	Yes
LD-10	3.5 ft	Located approximately 15 ft east of rear building door.	Tan sand, silt, and gravel to 1.0 ft; black/brown silt with trace of sand to 1.8 ft; medium and coarse sand with gravel from 1.8-2.6 ft; weathered green phyllite schist from 2.6-3.0 ft.	Yes
SED-1*	1.0 ft	Collected from floor drain outfall, along bank of Winooski River.	Material recovered consisted of silt.	No
SED-2*	1.0 ft	Collected below mid-point of rear transformer area, along River.	Material recovered consisted of silt.	Yes
RS-1*	5.5 ft	Located in rear former transformer storage area. See **Figure 2**.	Mixed sand and gravel fill with some silt to 1.25 ft; tan silt and very fine sand to 3.2 ft.; remainder of sample consisted of silt with broken rock fill with silt, sand, and gravel.	Yes
RS-2*	5.5 ft	Located in rear former transformer storage area. See **Figure 2**.	Mixed sands and gravel from grade to 1.75 ft; silty sand to 2.0 ft; mixed angular gravel with silt, sand, and some rounded gravel to 5.5 ft. Groundwater encountered at approximately 5.0 ft bgs.	Yes
RS-3*	8.25 ft	Located in rear former transformer storage area. See **Figure 2**.	See Boring Log for MW-1/RS-3 in **Appendix B** for detailed description.	Yes
RS-4*	6.5 ft	Located in rear former transformer storage area. See **Figure 2**.	Fine to coarse sand and gravel to 1.5 ft; weathered rock fill to 1.7 ft; silty sand (some iron-stained) from 1.7-4.5 ft; Medium and coarse sand to 5.5; broken schist and sand to 6.5 ft. Slight 'musty' odor from 4-6.5 ft.	Yes
RS-5*	7.0 ft	Located in rear former transformer storage area. See **Figure 2**.	Mixed sands and gravel from 0-1.2 ft; silty sand with little fine to medium gravel to 2.5; mixed sand and gravel with weathered schist to refusal at 7.0 ft. Slight petroleum odor throughout sample.	Yes

MW-1

TABLE 1
(continued)

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Environmental Sample Summary Table

Sample Identification	Depth of Boring (ft bgs)	Location of Sample	Materials Encountered (Description)	Refusal
RS-6	4.5 ft	Located in rear former transformer storage area. See Figure 2.	Loose silty sand and gravel to 0.5 ft; native silt from 0.5-1.5 ft; medium and coarse sand from 1.5-2.0 ft; dark gray silty sand from 2.0-4.5 ft (refusal).	Yes
RS-7*	5.5 ft	Located in rear former transformer storage area. See Figure 2.	Silty sand and gravel from 0-1.0 ft; black mixed sands with glass and debris from 1.0-1.6 ft; medium sand and silt to 2.6 ft; mixed weathered rock, sand, silt, and gravel to 2.8 ft; weathered schist to 5.5 ft.	Yes
RS-8	4.5 ft	Located in rear former transformer storage area. See Figure 2.	Silty sand and gravel from 0-1.2 ft; silt with fine and very fine sand to 1.9 ft; silt from 1.9-4.2 ft; light brown fine & medium sand with trace of silt and gravel from 4.2-4.3; weathered schist, sand and gravel to 4.5 ft.	Yes
RS-9*	3.0 ft	Located in rear former transformer storage area. See Figure 2.	Silt, sand, and gravel from 0-0.9 ft; black mixed sand and gravel to 1.3 ft; silt and weathered schist to 3.0 ft.	Yes
RS-10	12.0 ft	Located in rear former transformer storage area. See Figure 2.	Loose silty sand and gravel to 075 ft; brown silt and very fine sand to 2.5 ft; mixed sand, silt, gravel, and rock fill from 4.0-5.3 ft; brown silt from 5.3-5.9 ft; gray silt from 5.9-12.0 ft. Boring was caving in from top.	No
RS-11*	5.5 ft	Located in rear former transformer storage area. See Figure 2.	Mixed rock, sand, and gravel fill material to 4.0 ft; weathered schist from 4.0-5.5 ft.	Yes
RS-12*	8.0 ft	Located in rear former transformer storage area. See Figure 2.	Silt, sand, and gravel fill material from 0-0.6 ft; cobble from 0.6-0.8 ft; tight brown silt with fine and medium sand with roots from 0.8-1.8 ft; dense gray silt from 4.0-8.0 ft. Groundwater encountered at 6.0 ft bgs.	No
RS-13*	3.0 ft	Located in rear former transformer storage area. See Figure 2.	Silt, sand, and gravel fill material. Black from 0.5-1.0; tan/brown for remainder of sample.	Yes
RS-14*	8.0 ft	Located in rear former transformer storage area. See Figure 2.	Silt, sand, and gravel from 0.0-4.0 ft; black silty sand from 4.0-5.0 ft; dense gray silt from 5.0-8.0 ft. Refusal at 8.0 ft.	Yes
RS-15*	2.0 ft	Located in rear former transformer storage area. See Figure 2.	Loose tan sand and gravel. Refusal at 2.0 ft.	Yes

TABLE 1
(continued)

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Environmental Sample Summary Table

Sample Identification	Depth of Boring (ft bgs)	Location of Sample	Materials Encountered (Description)	Refusal
RS-16*	3.0 ft	Located in rear former transformer storage area. See **Figure 2**.	Loose sand and gravel fill material from 0-1.0 ft; brown silt with sand from 1.0-3.0 ft. Slight petroleum/oil odor.	Yes
RS-17*	4.5 ft	Located in rear former transformer storage area. See **Figure 2**.	Topsoil and loose fill with organics to 0.5 ft; mixed fine and medium sand and silt to 4.0 ft; weathered schist from 4.0-4.5 ft. Groundwater encountered at 0.5 ft.	Yes
RS-18*	6.9 ft	Located in rear former transformer storage area. See **Figure 2**.	See Boring Log for MW-2/RS-18 in **Appendix B** for detailed description.	Yes
RS-19*	3.0 ft	Located in rear former transformer storage area. See **Figure 2**.	Mixed silty sands with some gravel to 2.9ft; weathered schist from 2.9-3.0 ft. Sample is damp and has 'musty' odor.	Yes
RS-20*	6.9 ft	Located in rear former transformer storage area. See **Figure 2**.	See Boring Log for MW-3/RS-20 in **Appendix B** for detailed description.	Yes
FS-1*	12.0 ft	Sample collected 50 ft west of 'tailrace', west of site building.	Mixed silt, sand and gravel from 0.0-1.0 ft; fill with coal clinkers from 1.0-2.0 ft; gray silt with fine sand from 2.0-8.0 ft; soft gray silt from 8.0-8.9 ft; black, organic rich sand from 8.9-9.2 ft; soft gray silt to 12.0 ft.	No
FS-2*	4.5 ft	Sample collected approximately 50 ft west of FS-1.	Mixed sand and gravel fill material from 0-0.8 ft; mix of silt, sand and clay from 0.8-4.0 ft.	Yes
Doorway-1*	N/A	Perimeter of rear doorway, from 0-8 ft above ground level.	Brick and concrete.	N/A
East Wall*	N/A	Interior of east building wall, along staircase.	Brick and concrete.	N/A

MW-2

MW-3

TABLE 1
(continued)

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Environmental Sample Summary Table

Notes:

1. Samples submitted for laboratory analysis were analyzed via US EPA Method 8082 for Polychlorinated Biphenyls (PCBs) except for "Doorway-1" and "East Wall", which were analyzed for Dibenzo-p-dioxins and Dibenzo-p-furans via US EPA Method 8290.
2. All samples were collected from soil borings except the following:
   OT-1 – Collected from former concrete oil tank cover, currently stored in the rear portion of the SITE.
   Doorway-1 – Collected from south side of rear doorway, adjacent to former loading dock.
   East Wall – Collected from interior surfaces of inside east wall of building, adjacent to stairwell and former loading dock door.
3. Refusal is typically a good indication of bedrock. Bedrock beneath the SITE is reportedly a green phyllite schist of the Waits River formation.
4. Of the above samples, a total of thirty-five (35) samples were submitted for PCB analysis. Data for those analyses is presented as **Table 2**. Borings from which samples were taken for analysis are marked with an "*". Samples were selected based on known site history, visual and olfactory observations, and location of groundwater table at the time of sampling.

TABLE 2

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Summary of Analytical Data - PCBs

Sample ID	Sample Matrix	Date Collected	Arochlor 1016/1242	Arochlor 1220	Arochlor 1232	Arochlor 1248	Arochlor 1254	Arochlor 1260	Total Arochlor
			All Concentrations Presented In µg/kg.						
Building Material Samples									
DS-1; 0-2 ft	Soil	09/08/1999	<20.35[4]	<40.70	<20.35	<20.35	<20.35	***240***	***240***
OR-1; 0-2 ft	Soil	09/08/1999	<20.8	<41.6	<20.8	<20.8	<20.8	<20.8	ND
OT-1	Concrete	09/09/1999	<69.2	<138.4	<69.2	<69.2	***3,200***	<69.2	***3,200***
Sediment Samples									
SED-1	Sediment	09/08/1999	<4.18	<8.36	<4.18	<4.18	<4.18	<4.18	ND
SED-2	Sediment	09/08/1999	<4.0	<8.0	<4.0	<4.0	<4.0	<4.0	ND
Rear Loading Dock Samples									
LD-2; 0-4 ft	Soil	09/09/1999	***1,700***	<36.9	<18.45	<18.45	***600***	***750***	***3,050***
LD-3; 0-3 ft	Soil	09/08/1999	<7.38	<14.76	<7.38	<7.38	<7.38	***230***	***230***
LD-4; 0-4 ft	Soil	09/08/1999	<18.7	<37.4	<18.7	<18.7	<18.7	***470***	***470***
LD-4; 4-6 ft	Soil	09/08/1999	<3.64	<7.28	<3.64	<3.64	<3.64	<3.64	ND
LD-5; 0-4 ft	Soil	09/08/1999	<3.69	<7.38	<7.38	<7.38	<7.38	***130***	***130***
LD-7; 0-4 ft	Soil	09/08/1999	<38.9	<77.8	<38.9	<38.9	<38.9	<38.9	ND
LD-8; 0-4 ft	Soil	09/08/1999	<76.2	<152.4	<76.2	<76.2	<76.2	***640***	***640***
LD-9; 4-8 ft	Soil	09/08/1999	<4.58	<9.16	<4.58	<4.58	<4.58	***9.5***	***9.5***
Rear Transformer Storage Area Samples									
RS-1; 0-4 ft	Soil	09/09/1999	<181.5	<363.0	<181.5	<181.5	<181.5	<181.5	ND
RS-2; 4-6 ft	Soil	09/09/1999	<4.23	<8.46	<4.23	<4.23	<4.23	***1.8***	***1.8***
RS-3; 0-4 ft	Soil	09/09/1999	<73.2	<146.4	<73.2	<73.2	<73.2	***1,200***	***1,200***
RS-3; 4-8 ft	Soil	09/09/1999	<74.0	<148.0	<74.0	<74.0	<74.0	***1,200***	***1,200***
RS-4; 4-6 ft	Soil	09/09/1999	<76.2	<152.4	<76.2	<76.2	<76.2	<76.2	ND
RS-5; 0-4 ft	Soil	09/09/1999	<17.9	<35.8	<17.9	<17.9	***71***	<17.9	***71***
RS-5; 4-6 ft	Soil	09/09/1999	<148.2	<296.8	<148.2	<148.2	<148.2	<148.2	ND
RS-7; 4-5.5 ft	Soil	09/09/1999	<80.8	<161.6	<80.8	<80.8	<80.8	<80.8	ND
RS-9; 0-4 ft	Soil	09/09/1999	<30.8	<61.6	<30.8	<30.8	<30.8	***150***	***150***
RS-11; 0-4 ft	Soil	09/09/1999	<3.7	<7.4	<3.7	<3.7	<3.7	<3.7	ND
RS-12; 4-8 ft	Soil	09/09/1999	<38.3	<76.6	<38.3	<38.3	***72.2***	<38.3	***72.2***
RS-13; 0-3 ft	Soil	09/09/1999	<3.97	<7.94	<3.97	<3.97	<3.97	<3.97	ND
RS-14; 4-8 ft	Soil	09/09/1999	<4.05	<8.10	<4.05	<4.05	<4.05	<4.05	ND
RS-15; 0-2 ft	Soil	09/09/1999	<38.8	<77.6	<38.8	<38.8	<38.8	<38.8	ND
RS-16; 0-4 ft	Soil	09/09/1999	<390	<780	<390	<390	***80,000***	<390	***80,000***
RS-17; 0-4 ft	Soil	10/05/1999	<3.7	<7.4	<3.7	<3.7	<3.7	<3.7	ND
RS-18; 0-4 ft	Soil	10/05/1999	<3.89	<7.78	<3.89	<3.89	***12,000***	<3.89	***12,000***
RS-20; 0-4 ft	Soil	10/05/1999	<3.95	<7.90	<3.95	<3.95	***9,100***	<3.95	***9,100***
RS-20; 4-6 ft	Soil	10/05/1999	<3.75	<7.50	<3.75	<3.75	***22,000***	<3.75	***22,000***
RS-19; 0-3 ft	Soil	10/05/1999	<3.78	<7.56	<3.78	<3.78	<3.78	***610,000***	***610,000***
Front Transformer Storage Area Samples									
FS-1; 0-4 ft	Soil	10/05/1999	<3.69	<7.38	<3.69	<3.69	***20,000***	<3.69	***20,000***
FS-2; 0-4 ft	Soil	10/05/1999	<3.93	<7.86	<3.93	<3.93	***110,000***	<3.93	***110,000***
US EPA Region 3 - Risk Based Concentraions									
Standards for Site Soils (from 4/99 RBC Table)	Residential		320	320	320	320	320	320	320
	Industrial		2,900	2,900	2,900	2,900	2,900	2,900	2,900

Notes:
(1) Soil samples collected using TSEC's Geoprobe, Geoprobe Hand Tools, or a solid stem hand auger.
(2) US EPA RBC - EPA Risk Based Concentrations are based upon the 4/99 Risk Based Concentration Table.
(3) See Figure 2, SITE Plan for sample locations.
(4) Indicates that concentration of compound is below detection limit (i.e.- <20.35 indicates that compound was not detected at or above the instrument reporting limit of 20.35 µg/kg).
(5) Bold and Italic values indicate that compound is present at a concentration exceeding the US EPA RBC.
(6) All PCB analyses for this project were performed by ChemServe Environmental Analysts of Milford, New Hampshire.

1000 mg/kg "walk away clean"

TABLE 3

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Summary of Analytical Data - Dioxins

Sample Location[1]	TEF[2]	Doorway #1	East Wall	LAB METHOD BLANK
Analyte		Concentration (parts per trillion) (ng/kg)		
		Dioxins/Furans via US EPA Method 8290[3]		
2,3,7,8 Tetrachloridibenzo-p-dioxin	1	<0.156 [4]	<0.123	<0.133
1,2,3,7,8-Pentachloridibenzo-p-dioxin	0.5	0.869	<0.101	<0.100
1,2,3,4,7,8-Hexachloridibenzo-p-dioxin	0.1	1.91	<0.230	<0.154
1,2,3,6,7,8-Hexachloridibenzo-p-dioxin	0.1	12.8	0.482	<0.162
1,2,3,7,8,9-Hexachloridibenzo-p-dioxin	0.1	4.32	<0.218	<0.146
1,2,3,4,6,7,8-Heptachloridibenzo-p-dioxin	0.01	415	4.58	<0.176
1,2,3,4,6,7,8,9-Octachloridibenzo-p-dioxin	0.001	3,260	22.5	1.22
2,3,7,8-Tetrachlorodibenzofuran	0.1	0.499	<0.406	<0.100
1,2,3,7,8-Pentachlorodibenzofuran	0.05	0.328	0.195	<0.0650
2,3,4,7,8-Pentachlorodibenzofuran	0.5	1.34	10.5	<0.0636
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1	3.07	0.338	<0.142
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1	<1.10	<0.193	<0.174
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1	2.62	0.470	<0.149
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1	5.96	0.513	<0.159
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01	144	3.55	<0.157
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01	8.42	<0.237	<0.191
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.001	396	3.22	<0.306
Total Tetrachloridibenzo-p-dioxin	NA[5]	<0.156	<0.123	<0.133
Total Pentachloridibenzo-p-dioxin	NA	3.69	[0.764]	[0.212]
Total Hexachloridibenzo-p-dioxin	NA	46.0	2.19	[0.234]
Total Heptachloridibenzo-p-dioxin	NA	643	8.42	<0.176
Total Tetrachlorodibenzofuran	NA	1.27	0.531	<0.100
Total Pentachlorodibenzofuran	NA	18.8	9.65	<0.0636
Total Hexachlorodibenzofuran	NA	101	10.4	<0.142
Total Heptachlorodibenzofuran	NA	424	8.43	<0.157
Total Polychlorinated dibenzo-p-dioxins & dibenzofurans	NA	4,890	65.3	1.22
TEQ (ND=0)	**NA**	**13.1**	**0.822**	**0.0012**
TEQ (ND=1/2)	NA	13.3	0.950	0.173
TEQ EMPC(ND=0)	NA	13.6	0.863	0.0012
TEQ EMPC(ND=1/2)	NA	13.7	0.983	0.173

Notes:
(1) See Figure 2, SITE Plan for sample locations.
(2) TEF - Toxic Equivalent Factor
(3) Sample analyses were conducted by Paradigm Analytical Laboratories, Inc. of Wilmington, North Carolina.
(4) Indicates that concentration of compound is below detection limit (i.e.- <0.156 indicates that compound was not detected at or above the instrument reporting limit of 0.156 ppt).
(5) NA - not applicable.
(6) US EPA RBC for Dioxin TEQ is 43 ppt for industrial sites; 3.8 ppt for residential sites.

TABLE 4

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
MONTPELIER, VERMONT

SMS SITE #98-2562

Summary of Water Table Elevations - October 5, 1999

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	102.38	ND	7.18	10.20	3.02	95.20
MW-2	101.90	ND	2.21	7.65	5.44	99.69
MW-3	100.84	ND	2.27	6.80	4.53	98.57
River	NA	NA	NA	NA	NA	NM

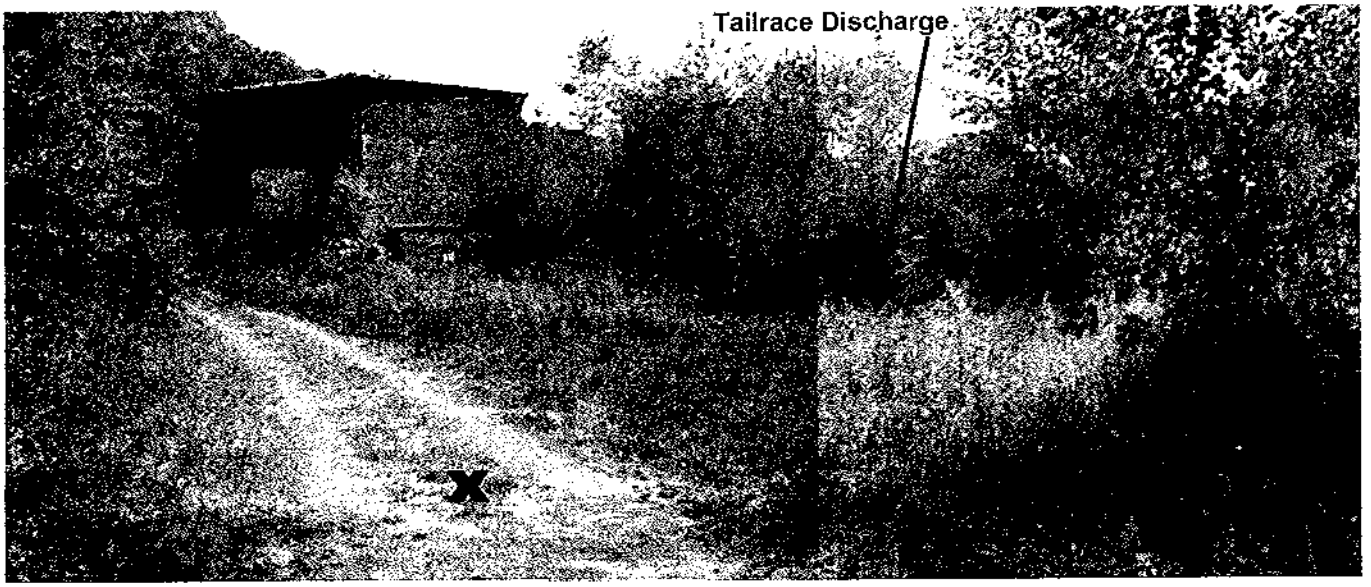
Notes 1. Elevation data is referenced to a TBM. Units are in feet.
2. ND - not detected.
3. NA - not applicable.
4. Measurements recorded are referenced to a marking on top of PVC riser for each well.
5. Depth to fluid measurements were obtained using a Solinst Interface Probe.
6. Depth of well is measured with respect to top of casing. Casing stickups are 2.34' (MW-1), 0.90' (MW-2), and 0.04' (MW-3).

jpb:\project\97036\1099ssitables.xls\Table 4

APPENDIX A

SITE PHOTOGRAPHS

GREEN MOUNTAIN POWER CORPORATION PLANT #4
MONTPELIER, VERMONT
SMS SITE #98-2562



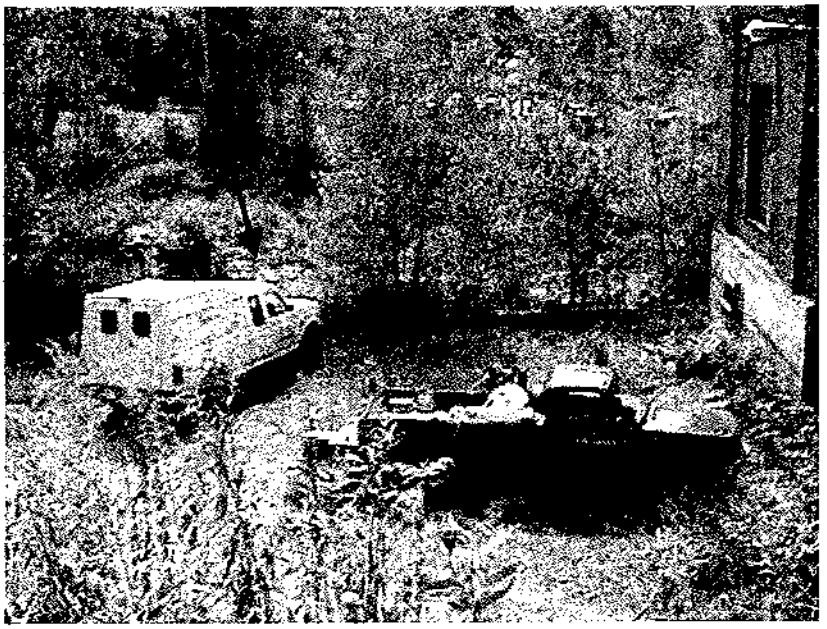
PHOTOGRAPH 1 – View of SITE building looking east from entrance road. Note location of former tailrace discharge.

PHOTOGRAPH 2 – View of entrance road looking west. Photo is taken approximately 150 ft east of site building. Note location of "x"; same location in both photos.

SITE PHOTOGRAPHS

GREEN MOUNTAIN POWER CORPORATION PLANT #4
MONTPELIER, VERMONT
SMS SITE #98-2562

PHOTOGRAPH 3 – View of building from the rear.

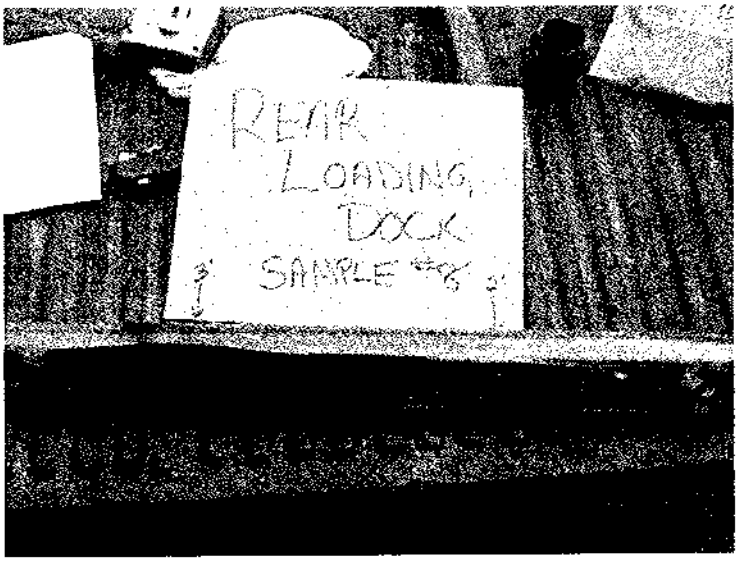


PHOTOGRAPH 4 – View of former rear loading dock area.
Note location of the Winooski River in the background.

SITE PHOTOGRAPHS

GREEN MOUNTAIN POWER CORPORATION PLANT #4
MONTPELIER, VERMONT
SMS SITE #98-2562

PHOTOGRAPH 5 – Geoprobe® collecting soil samples in the former rear transformer storage area.



PHOTOGRAPH 6 – Typical Geoprobe® core sample.

SITE PHOTOGRAPHS

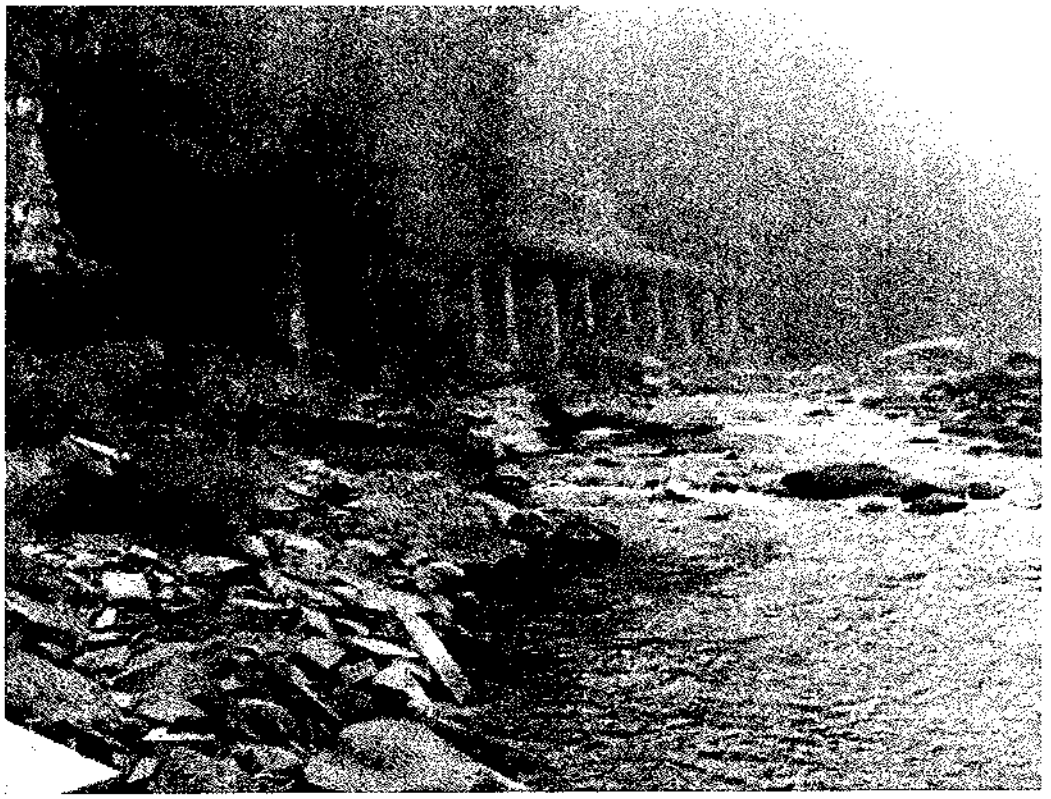
GREEN MOUNTAIN POWER CORPORATION PLANT #4
MONTPELIER, VERMONT
SMS SITE #98-2562

PHOTOGRAPH 7 – Floor Drain located in main room of building.

PHOTOGRAPH 8 – Location of Floor Drain discharge, along riverbank. Stake is located at SED-1 sample location.

SITE PHOTOGRAPHS

GREEN MOUNTAIN POWER CORPORATION PLANT #4
MONTPELIER, VERMONT
SMS SITE #98-2562



PHOTOGRAPH 9 – View looking upriver from floor drain outfall.
Note: Site is located behind penstock.

PHOTOGRAPH 10 – Former oil tank cover.
Located in rear area of SITE.

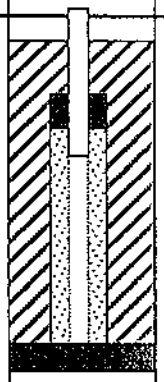
APPENDIX B

TWIN STATE ENVIRONMENTAL
34 Roosevelt Highway Colchester, Vermont 05446
(802) 654-8663 FAX: (802) 654-8667

MONITORING WELL/SOIL BORING LOG

Project Name:	**GMP Plant #4**	WELL/ BORING ID:
Location:	**Montpelier, Vermont**	**MW-1/RS-3**
TSEC Project #:	**97038**	

INSTALL DATE:	September 8, 1999	WELL DEPTH: 7.9 ft bgs	BORING DEPTH: 8.0 ft
TSEC REP:	Jon Berntsen	DEPTH TO WATER: (during drilling)	4.75 ft bgs
DRILLING CO:	TSEC Colchester, VT	SCREEN DIA: 1-inch	DEPTH: 2.9 - 7.9 ft bgs
		SCREEN TYPE/SIZE:	0.010"-slot schedule 40 PVC
DRILLING METHOD:	Geoprobe®	RISER TYPE:	Schedule 40 PVC
SAMPLING METHOD:	Macrocore	RISER DIA.: 1-inch	DEPTH: 2.34 ft ag-2.9 ft bg
REFERENCE POINT (RP):	Grade	GUARD TYPE:	Stickup
ELEVATION OF RP:	100.04 ft (wrt TBM)	RISER CAP:	Locking expansion plug.
REMARKS:	Soil boring was completed as groundwater monitoring well MW-1.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0–25		0-4	5.6	3.5 ft recovery	0.0-0.3: SAND and GRAVEL fill material. 0.3-2.5: Silty SAND, Gray, dense, slight petroleum odor (oil). 2.5-3.5: Fine to coarse (mixed) SAND. Gray. Moderate petroleum odor.
		4-8	1.5	2.8 ft recovery	4.0-4.75: Silty fine to coarse (mixed) SAND with little gravel. 4.75-5.5: Fine to medium GRAVEL. Loose, saturated, black petroleum sheen. 5.5-6.8: Broken ROCK fragments with some silt and fine sand. Saturated.
		8-10	0.6	0.25 ft recovery	8.0-8.25: Broken ROCK fragments. Loose, saturated. (Rock appears to be phyllite schist of Waits River Formation) End of Sampling = 8.25 feet End of Boring = 8.25 feet

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROXIMATE)

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.

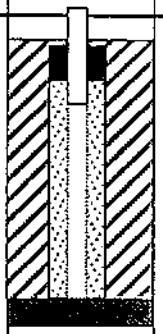
TWIN STATE ENVIRONMENTAL
34 Roosevelt Highway Colchester, Vermont 05446
(802) 654-8663 FAX: (802) 654-8667

MONITORING WELL/SOIL BORING LOG

Project Name: **GMP Plant #4**
Location: **Montpelier, Vermont**
TSEC Project #: **97038**

WELL/ BORING ID: **MW-2/RS-18**

INSTALL DATE:	October 5, 1999	WELL DEPTH: 6.75 ft bgs	BORING DEPTH: 6.9 ft
TSEC REP:	Jon Berntsen	DEPTH TO WATER: (during drilling)	0.1 ft bgs
DRILLING CO:	TSEC Colchester, VT	SCREEN DIA: 1-inch	DEPTH: 1.75 - 6.75 ft bgs
		SCREEN TYPE/SIZE:	0.010"-slot schedule 40 PVC
DRILLING METHOD:	Geoprobe®	RISER TYPE:	Schedule 40 PVC
SAMPLING METHOD:	Macrocore	RISER DIA.: 1-inch	DEPTH: 0.9 ft ag-1.75 ft bg
REFERENCE POINT (RP):	Grade	GUARD TYPE:	Stickup
ELEVATION OF RP:	101.00 ft (wrt TBM)	RISER CAP:	Locking expansion plug.
REMARKS:	Soil boring was completed as groundwater monitoring well MW-2.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0		0-4		1.5 ft recovery	0.0-0.1: Decaying vegetation (leaves, etc.) 0.1-1.0: Medium and coarse SAND with little fine gravel and trace of silt. Saturated. 1.0-1.5: Broken SHALE fragments (fill material). Gray, saturated.
1					
2					
3					
4		4-8		2.0 ft recovery	4.0-5.3: Medium, coarse, and very coarse SAND with fine to medium GRAVEL. Brown, saturated. 5.3-6.0: Medium, coarse, and very coarse SAND with fine to medium GRAVEL and some silt. Weathered schist rock in core tip. Gray, saturated. Refusal at 6.9 ft bgs. End of Sampling = 6.90 feet End of Boring = 6.90 feet
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROXIMATE)

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.

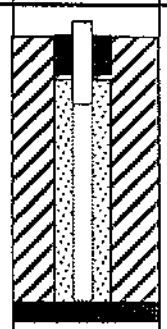
TWIN STATE ENVIRONMENTAL CORPORATION
34 Roosevelt Highway Colchester, Vermont 05446
(802) 654-8663 FAX: (802) 654-8667

MONITORING WELL/SOIL BORING LOG

Project Name: **GMP Plant #4**
Location: **Montpelier, Vermont**
TSEC Project #: **97038**

WELL/ BORING ID: **MW-3/RS-20**

INSTALL DATE:	October 5, 1999	WELL DEPTH: 6.75 ft bgs	BORING DEPTH: 6.9 ft
TSEC REP:	Jon Berntsen	DEPTH TO WATER: (during drilling)	2.0 ft bgs
DRILLING CO:	TSEC Colchester, VT	SCREEN DIA: 1-inch	DEPTH: 1.75 - 6.75 ft bgs
		SCREEN TYPE/SIZE:	0.010"-slot schedule 40 PVC
DRILLING METHOD:	Geoprobe®	RISER TYPE:	Schedule 40 PVC
SAMPLING METHOD:	Macrocore	RISER DIA.: 1-inch	DEPTH: 0.1 ft ag-1.75 ft bg
REFERENCE POINT (RP):	Grade	GUARD TYPE:	Stickup
ELEVATION OF RP:	101.00 ft (wrt TBM)	RISER CAP:	Locking expansion plug.
REMARKS:	Soil boring was completed as groundwater monitoring well MW-3.		

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES
0–25		0-4		1.5 ft recovery	0.0-0.7: Fine and medium SAND with trace of gravel and silt. Brown, damp. 0.7-0.8: Silty fine SAND. Black, damp. 0.8-1.5: Silty fine SAND with rock frags. Brown sand with green/gray rock. Damp.
		4-8		0.7 ft recovery	4.0-4.7: Fine to medium SANDS with coarse gravel. Saturated, "running". Refusal encountered at 6.9 ft bgs. End of Sampling = 6.90 feet End of Boring = 6.90 feet

LEGEND: CEMENT GROUT; NATIVE BACKFILL; BENTONITE SEAL; SAND PACK; WELL SCREEN; RISER PIPE; HS HEAD SPACE; WATER LEVEL (APPROXIMATE)

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

ENVIRONMENTAL SAMPLING PLAN

GREEN MOUNTAIN POWER CORPORATION
PLANT #4
GALLISON HILL ROAD
MONTPELIER, VERMONT

August 30, 1999

Prepared for:

GREEN MOUNTAIN POWER

GREEN MOUNTAIN POWER CORPORATION
163 ACORN LANE
COLCHESTER, VERMONT 05446
Contact: Mr. Lee E. Marchessault
(802) 655-8771

Prepared by:

Environmental Scientists and Engineers

TWIN STATE ENVIRONMENTAL CORPORATION

34 Roosevelt Highway – Colchester, Vermont 05446

1.0 INTRODUCTION

This work plan for environmental sampling and analysis has been prepared by Twin State Environmental Corporation (TSEC) to further assess the environmental condition of the Green Mountain Power Corporation (GMP) Plant #4 (SITE) (SMS Site #98-2562). The SITE is located on Gallison Hill Road in Montpelier, Vermont. Please refer to **Figure 1**, SITE Location Map and **Figure 2**, SITE Plan for additional information.

The proposed activities contained within this work plan are intended to expand upon the data collected during TSEC's *Preliminary Environmental Site Assessment (P-ESA)*, which was prepared in the fall of 1998, and to address the concerns that were raised during an August 2, 1999 meeting with TSEC, GMP, and the State of Vermont Sites Management Section (VT SMS). This plan describes the objectives, technical approach, and specific methods to be employed during the completion of this investigation.

1.1 Objectives and Scope

Based on data obtained during the P-ESA and from TSEC's understanding of the SITE history, it has been determined that the contaminants of concern (COC) at the SITE consist primarily of dioxins and polychlorinated biphenyls (PCBs). Both contaminants are documented to be present in soils and building materials at the SITE. Polyaromatic hydrocarbons (PAHs) were also detected, but at concentrations that were below referenced risk based concentrations (please refer to **Section 1.2**).

The overall goal of this sampling plan is to characterize the hazardous waste constituents present on-SITE. To attain these goals, the following objectives have been developed.

- Determine the degree and extent of PCB contamination in the soils underlying the SITE.
- Calculate the groundwater flow direction, hydraulic gradient, and groundwater flow velocity beneath the SITE.
- Install a groundwater monitoring well network to be utilized for a SITE monitoring program.
- Determine the degree and extent of PCB contamination present in the groundwater beneath the SITE.
- Determine the presence or absence of PCB contamination beneath the building.
- Establish whether PCBs and dioxins are present in the SITE building materials.
- Evaluate the potential for off SITE migration of PCBs and dioxins.
- Determine the outfall locations of the floor drains that originate inside the main shop area; and,
- Calculate the approximate volume of contaminated soils present on SITE.

1.2 Previous Investigations

As mentioned in **Section 1.0**, TSEC conducted a P-ESA of the Plant #4 facility on behalf of GMP in 1998. The purpose of the investigation was to determine the presence or absence of PAHs and PCBs

in the SITE soils and building materials. Based upon the SITE history, namely the fire that occurred in the 1950's adjacent to the former loading dock, and the data obtained during initial sampling activities, TSEC recommended that additional sampling be conducted for dioxin compounds.

A total of nine (9) composite soil samples and twelve (12) wipe samples were collected from the SITE between June 4 and 5, 1998. Soil samples were collected at depths ranging from 0" to 18" below ground surface (bgs), and the wipe samples were collected from the surface of the building floors and walls. Samples were submitted to Endyne, Inc. of Williston, Vermont for laboratory analysis via US EPA Method 8080 for PCBs and via US EPA Method 8270 for PAHs.

After a review of the results of the PCB and PAH analyses, TSEC collected two (2) samples for dioxin analysis. One (1) sample was collected from the soils beneath the former loading dock; the other was collected from the brick wall material approximately ten (10) ft above the former loading dock. These samples were submitted to Paradigm Analytical Laboratories of Wilmington, North Carolina for dioxin/furan analysis via US EPA Method 8290.

PCB compounds, PAH compounds and dioxins all were detected in the samples collected from the SITE. No concentration of PAH compounds or dioxins were found to be above the limits set by the U.S. Environmental Protection Agency (EPA) Region 3 Risk Based Concentrations (RBCs) for industrial sites. Concentrations of PCB compounds were found to be above the EPA standards for residential sites (320 milligrams per kilogram [mg/kg]) at five (5) sample locations; and at concentrations above the industrial site standard of 2,900 mg/kg at three (3) of the five (5) locations.

Although the initial investigation indicated the presence of PCBs and dioxins, the degree and extent of the contamination has yet to be adequately defined. It is therefore the purpose of this sampling plan to further expand upon the data obtained during the completion of the preliminary assessment.

2.0 TECHNICAL APPROACH

As with any investigation, the scope of work proposed to adequately address the project objectives can only be estimated. It may therefore become necessary to reassess the original scope during the data collection process to ensure that the proper data is being collected. As such, TSEC believes that a phased approach is the most effective manner in which to conduct the investigation.

2.1 Soil Boring Program

During the P-ESA, TSEC identified three (3) primary areas of concern that exhibited elevated concentrations of PCBs in soil. These are the rear transformer storage area, the former loading dock, and the location of the former oil storage tank. We feel that these areas warrant additional investigation. All of these locations are situated on the eastern portion of the SITE.

A total of 20 soil borings have been proposed for the SITE in the locations identified on **Figure 3,** Proposed Soil Boring Locations. It is anticipated that a total of approximately 25 samples will be analyzed by a laboratory for PCBs via US EPA Method 8082. TSEC proposes collecting all soil samples during a two (2) day sampling effort to minimize field activities. All samples will be submitted to the laboratory under chain of custody. Due to holing time restrictions (14 days for

extraction), all samples must go through the extraction procedure upon arrival at the laboratory. Following extraction, there is a 40 day holding time.

Selection of initial samples for analysis will be based upon the results of field investigation findings. Subsequent samples will be analyzed based upon the findings of the initial analysis round. The overall objective of the soil sampling will be to reasonably define the limits of PCB contamination in soil.

2.1.1 Rear Transformer Area

To adequately assess the distribution of PCB contamination TSEC proposes establishing an unbiased sampling grid centered on the eastern portion of the SITE, at the location of the former rear transformer storage area. Discrete sample locations will be placed at approximately 25 ft intervals. Continuous samples will be collected in two (2) foot depth intervals until the groundwater table is encountered. Samples will be field screened with a photoionization detector (PID) equipped with a 10.6 eV lamp. It is anticipated that approximately fifteen (15) soil samples will be collected for laboratory analysis from ten (10) soil boring locations. Samples will be selected based on PID readings and visual observations of the collected samples.

2.1.2 Former Loading Dock and Former Oil Storage Tank

These areas are situated directly adjacent to the east wall of the SITE structure and contained elevated concentrations of PCBs. Soil borings will be collected from approximately ten (10) biased sampling locations. Continuous samples will be collected in two (2) foot depth intervals until the groundwater table is encountered. Samples will be field screened with a PID. It is anticipated that approximately eight (8) soil samples will be collected from these borings for laboratory analysis of PCBs via US EPA Method 8082.

2.2 Groundwater Sampling Program

2.2.1 Monitoring Well Installation

During the completion of the soil boring program, TSEC will install five (5) groundwater monitoring wells in the locations indicated on **Figure 4**, Proposed Monitoring Well Locations. These wells will be installed as described in **Section 3.1.2**. The location of these wells will be based on the findings of the Preliminary Environmental Site Assessment, and will represent the locations where groundwater contamination is likely to exist.

2.2.2 Groundwater Sampling Program

Approximately one (1) week following the installation of the groundwater monitoring wells, TSEC will return to the SITE to collect groundwater samples for laboratory analysis of PCBs via US EPA Method 8082. The methods described in **Section 3.2** will be employed.

2.3 Sediment Sampling

Due to the location of the rear transformer storage area and its close proximity to the Winooski River, TSEC proposes collecting two (2) sediment samples from the river bank directly adjacent to and downstream of the storage area. These samples will be analyzed for PCBs via US EPA Method 8082. This will assist in determining whether the PCBs are migrating off SITE and are potentially impacting the quality of the Winooski River.

2.4 Building Material and Sub-Slab Sampling

2.4.1 Sub-Slab Soil Sampling

During the P-ESA, TSEC identified several cracks in the concrete floor within the SITE building. Due to the location of these cracks and the potential for these features to act as a preferential pathway for contaminant migration, TSEC recommends coring through the floor at two (2) locations (in the former oil room and in the former drum storage area) and collecting soil samples from each core location. Samples will be submitted for laboratory analysis of PCBs via US EPA Method 8082.

2.4.2 Former Oil Tank Sample

Located to the east of the SITE building is the top portion of the former concrete oil holding tank that was used to store transformer oil prior to disposal. Due to the porous nature of the concrete and since oil containing PCBs was likely in direct contact with this feature, it is likely contaminated with PCBs. TSEC proposes to collect one (1) composite sample from the four sides of the former tank for laboratory analysis of PCBs via US EPA Method 8082.

2.4.3 Building Material Samples for Dioxin

Following further discussion of the events surrounding the fire that occurred in the 1950's it was revealed that the fire also burned inside the building along the eastern interior wall. With dioxins detected in samples collected from the exterior of the building, and the potential for dioxins to be present inside the building, GMP asked TSEC to incorporate the collection of two (2) additional samples for dioxin analysis into this work plan. Samples would be collected from the eastern inside wall of the building and analyzed for dioxins/furans via US EPA Method 8290.

2.5 Floor Drain Sampling

Two (2) drains have been observed in the floor of the SITE building. These are located in the former drum storage room. Due to the potential for a release of PCB containing materials to these drains, TSEC recommends determining the configuration and ultimate discharge location of these drains.

3.0 FIELD INVESTIGATION PROCEDURES

The following methodologies will be employed during the completion of the field investigation portion of this project.

3.1 Soil Boring and Monitoring Well Installation

3.1.1 Soil Boring Completion

The Geoprobe® method is used to allow for efficient collection of soil samples that offer a portrait of subsurface geological stratigraphy; identification of contamination; and easy installation of groundwater monitoring wells. The Geoprobe® method is typically limited to accessing the unconsolidated overburden strata and upper weathered bedrock surface.

Macrocore soil samples are generally collected in 4-ft intervals; however, they can be collected at any desired interval. Standard penetration tests of the relative resistance of the various strata are used to help classify the soil texture.

Macrocore samples are typically field screened for volatile organic compounds (VOCs) using an organic vapor meter (OVM) with a photoionization detector. Soils are screened using either standard headspace methodology or through the collection of ambient OVM readings. Drill cuttings and/or fluids that are found through field screening to be contaminated will be containerized, analyzed for chemical contaminants, and disposed of appropriately. In some cases, accumulated wastes may require manifesting and disposal as hazardous waste.

At the completion of the drilling program, boring logs are created. Information contained in the boring logs will be a very important tool in planning future explorations and/or remediation approaches. Boring logs are completed using either the Unified Soil Classification System (USCS) or the Burmister Soil Classification System (as appropriate) to classify soil type. Also on the boring log are descriptions of contamination encountered, a graphic representation of the monitoring well (if installed), and measurement of depth to groundwater.

3.1.2 Monitoring Well Installation

Unless specified otherwise, monitoring wells will be constructed using 1-inch diameter schedule 40 polyvinyl chloride (PVC) monitoring well screen with 1-inch diameter threaded riser pipe. The monitoring well will typically be screened from 5-10 ft below the observed depth to groundwater (water table) to 3-5 ft above the water table (in order to monitor for free petroleum product). Well construction is subject to change due to field conditions encountered during drilling.

The annulus between the inner and outer well screens is backfilled with a clean Ottawa-type filter sand, or equivalent. About 1 to 2 ft of bentonite seal will be placed above the sand pack to hydraulically isolate the lower screened zone. The remainder of the annulus will be backfilled with clean sand or uncontaminated test boring cuttings to approximately 1 ft below the ground surface.

A flush-mounted watertight curb box (Breshnahan 6x10 inch diameter, or equivalent) or steel standpipe is set in concrete to protect the monitoring well. Each monitoring well will be fitted with an expansion plug to avoid surface infiltration to the aquifer.

Monitoring wells will be developed to remove any drilling fluids or fine particulates introduced into the formation during drilling and/or installation. In addition, well development is performed to

hydraulically connect the aquifer and the well after installation allowing for more accurate determination of in situ conditions (i.e. water level, aquifer parameters, and chemical constituents).

Monitoring wells will be surveyed if it is important to determine groundwater flow direction. The well elevation can be referenced to a temporary benchmark (TBM) or to a USGS datum. Water level elevations in the monitoring wells will be measured with an interface probe, or equivalent, to provide data used to calculate the hydraulic gradient and groundwater flow direction.

3.2 Groundwater Sampling Methodology

3.2.1 Static Water Table Measurements

Collection of water elevations on a continuing basis is important to monitor horizontal and vertical flow gradients. A change in hydrologic conditions may necessitate modification to the design of the groundwater monitoring system.

Measurements should be made from a marked location at the top of the well casing and top of curb box/well cover. Typical measurements to be obtained are depth to an immiscible layer, depth to water, and depth to the bottom of the well. The wells are measured in order of increasing contamination and the interface probe is decontaminated between each measurement.

3.2.2 Well Evacuation

Based upon the static water level and depth of well, the amount of standing water in the well can be calculated. It is standard to remove three (3) standing volumes of water prior to obtaining samples for testing. In certain circumstances there may by an insufficient amount of water to remove this volume, a note should be made when sampling under this circumstance.

Prior to sampling, water will be evacuated using a peristaltic pump with dedicated polyethylene tubing and/or a dedicated, disposable Teflon bailer. Groundwater samples will not be collected from monitoring wells where floating product is detected.

3.2.3 Sample Collection

Groundwater samples will be collected using decontaminated or dedicated manual bailers and placed in sample containers supplied by a state certified laboratory. Samples should be properly labeled and stored on ice. Preservation of samples may be necessary depending on the test methods required. Samples tested for volatile organic compounds (VOCs) require preservation with hydrochloric acid to a pH <2 (no headspace or bubbles are to be present to minimize volatilization).

A record of activities relating to the collection of samples will be maintained in a TSEC field book. This information will include the names of the sampling personnel, the date, sample location, sampling methodology, and a detailed description of any apparent characteristics of the sample.

Chain-of-Custody (COC) procedures will be implemented to ensure that the sample is traceable from the time of collection through receipt by the laboratory. COC procedures will be initiated in the field

at the time of sample collection. COC forms including the signatures of the relinquisher(s) and the receiver, the date, time, and any pertinent remarks are filled out and sent along with the samples to the laboratory.

3.3 Headspace Field Screening Methodology

Headspace field screening of soil samples is performed with a ThermoEnvironmental Instruments Model 580B OVM equipped with a 10.6 eV photoionization detector. Prior to calibration or field screening activities, the electronics of the OVM will be allowed to warm up for at least 5 min. After that period, the response of the OVM will be checked against a known VOC source such as a fuel tank or organic solvent based marker.

The OVM will be calibrated daily using a compressed gas cylinder of isobutylene with a concentration of 100 parts per million volume (ppmv). Following calibration, a response factor of 0.7 will be entered which converts measurements to benzene equivalents. The date and time of calibration will be recorded in a TSEC field book.

Soil samples for field screening will be placed in a clean, glass 4 or 8 oz. wide mouth jar to about half of the container volume. The jar will be sealed with aluminum foil and screw capped. The sample will be warmed and shaken to encourage partition of volatile compounds to transfer into the vapor phase and fill the jar headspace. After a period of approximately 10 min, the probe of the OVM will be inserted through the aluminum foil. The highest concentration will be recorded to the nearest 0.1 ppmv. If required, soil samples for analytical analyses will be collected according to standard protocol.

3.4 Sediment Sampling Procedures

TSEC will initiate the sampling of riverbank sediment by performing a visual reconnaissance of the bank from the river. Two (2) areas will be selected from this reconnaissance. TSEC will begin by manually removing the rip-rap bank stabilization material to obtain a representative sediment sample. Samples will be collected with a decontaminated metal scoop and placed into a laboratory supplied sample container. The sample container will subsequently be placed into a cooler with ice.

3.5 Building Material and Sub-Slab Sampling

To access the soils beneath the SITE building concrete slab floor, TSEC proposes opening a pilot hole in the floor using an electric core drill. A 3-inch diameter hole will be opened with the drill and Geoprobe® tools will be advanced by hand to a depth of two (2) ft bgs. The core locations will be backfilled with concrete upon completion.

To collect samples from the former oil tank, TSEC will use a metal geologists rock hammer to collect chips of concrete from the midpoint of each sidewall of the tank. The samples will be mixed together is a stainless steel mixing bowl and placed in a glass sample container.

The samples obtained from the interior walls of the SITE building will be collected using the core drill and/or the rock hammer. Sample locations will be selected by GMP personnel based on the location of the fire that occurred in the 1950's.

3.6 Floor Drain Sampling

The locations of floor drains will be determined by passing a common "plumbing snake" down the length of the discharge line. TSEC will attempt to determine the location of pipe elbows and the ultimate discharge location using this method. If evidence exists that PCB contamination is likely present at the outfall location, then a soil/sediment sample will likely be collected for laboratory analysis.

4.0 PROJECT QUALITY ASSURANCE/QUALITY CONTROL

TSEC has prepared a Quality Assurance Project Plan (QAPP) to ensure the integrity of the data collected during this investigation. This QAPP has been presented as **Attachment 1** to this document.

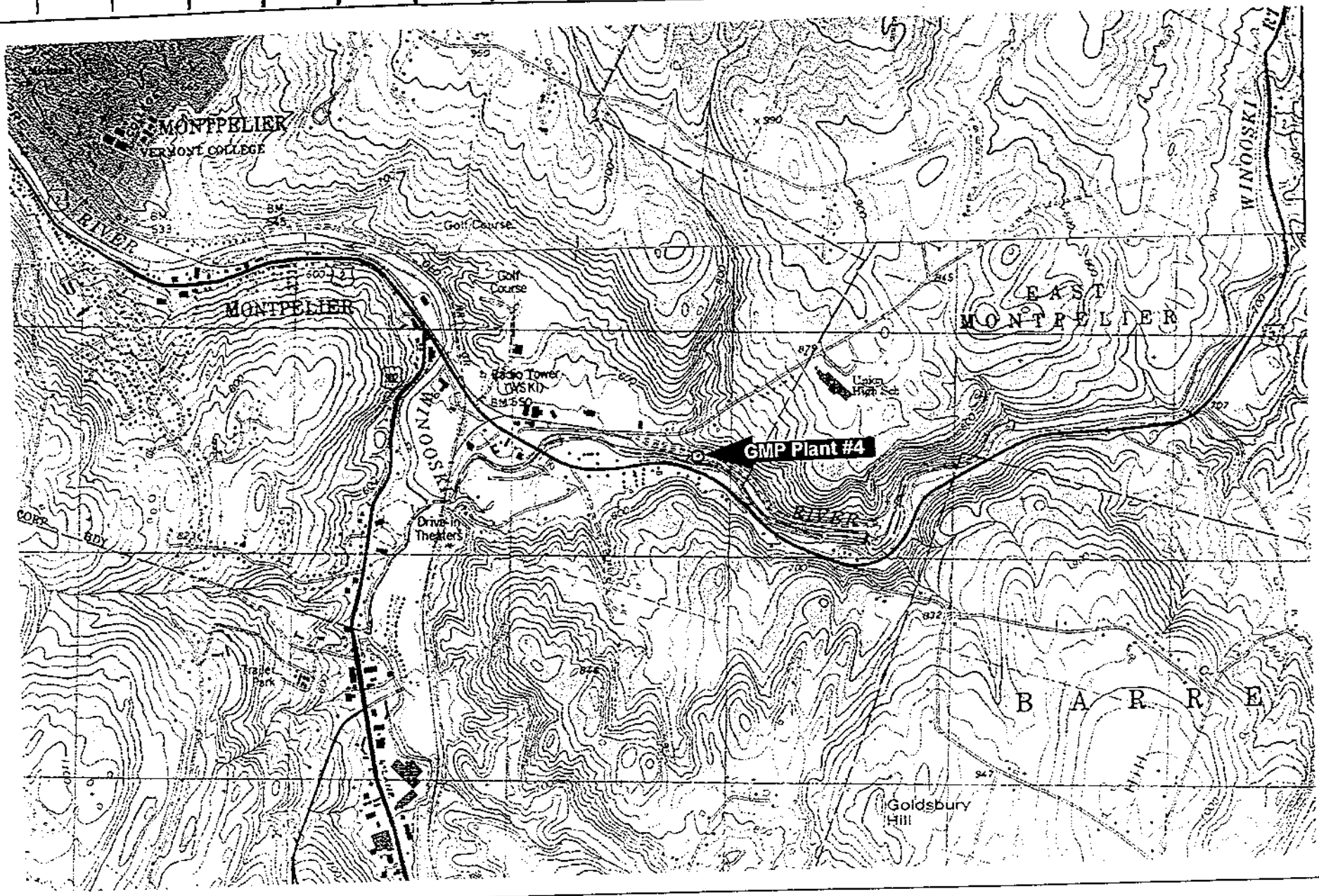
5.0 PROJECT SCHEDULE

TSEC can proceed with the activities outlined in this work plan upon written approval of the work plan by the VT SMS and GMP. We anticipate completing field activities by the middle of September, with a report completed by mid October 1999.

6.0 ESTIMATED PROJECT COST

Table 1, which has been presented at the end of this document, outlines the estimated costs required to complete this scope of work. This scope of work can be completed in phases, at the discretion of GMP. The total estimated cost of this project, as presented in this document is ***$13,097.75***. It is anticipated that if the scope of work is broken into several phases, the costs will increase due to multiple mobilizations, report preparations, and additional project management time.

FIGURES

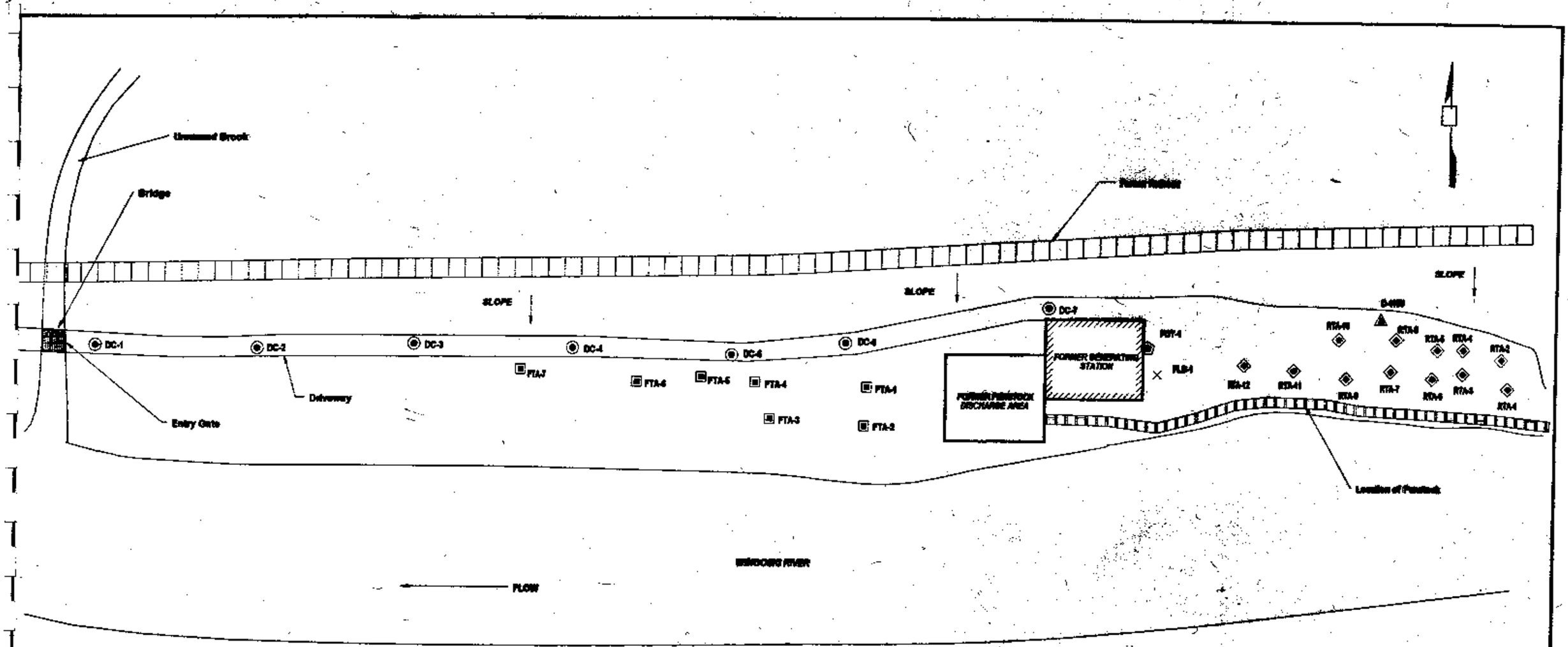


N
W E
S

0 2000
Scale (in feet) 1"=2,000'

Source: USGS 7.5 Minute Topographic Series
Barre West and Montpelier, Vermont Quadrangles

Project No: 97-036	Designed By: jpb Checked By: Approved By: Drawn By: jpb Scale: as shown Date: 12/02/98	TWIN STATE ENVIRONMENTAL CORP. 65 Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 1 SITE LOCATION MAP GMP Plant #4 East Montpelier, VT



LEGEND

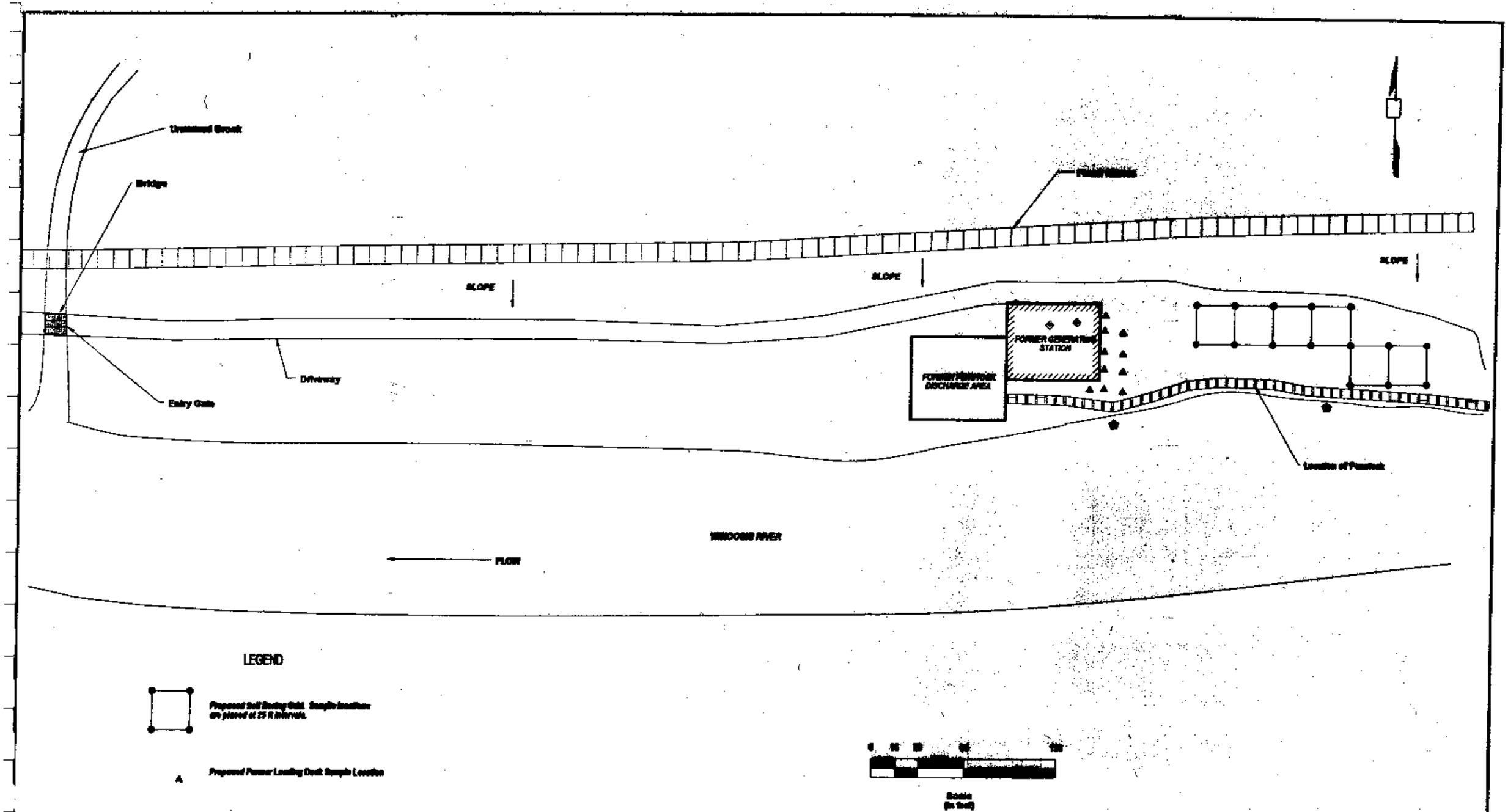
Preliminary Environmental Site Assessment
Soil Sampling Locations

- ◉ Driveway Sample Location (DC)
- ▣ Front Transformer Area Sample Location (FTA)
- ◈ Rear Transformer Area Sample Location (RTA)
- × Former Loading Dock Sample Location (FLD)
- ⬟ Former Oil Tank Sample Location (FOT)
- ▲ Delta-4160 Transformer Sample Location (D-4160)

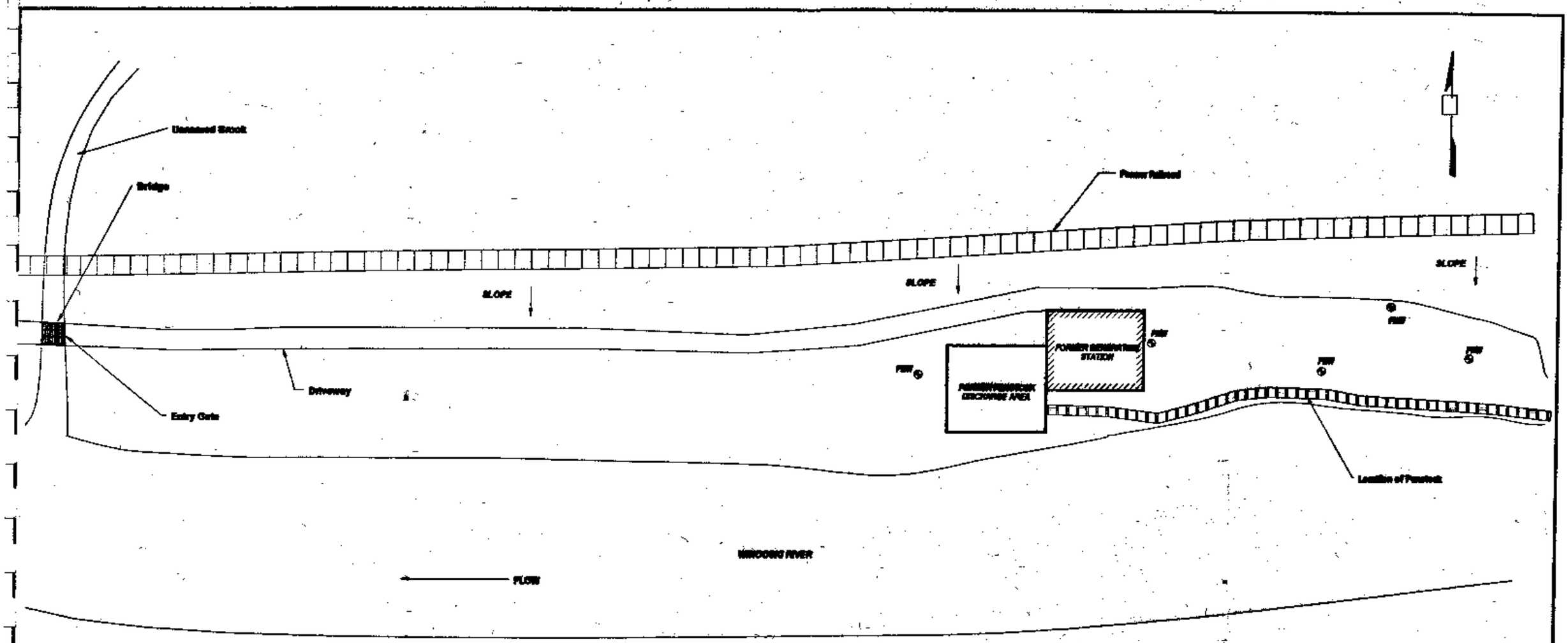
0 15 30 60 120

Scale
(in feet)

Project# 97038	Designed by: Checked by: Approved by: Drawn by: Scale: 1"=60' Date: 08/19/99	TWIN STATE ENVIRONMENTAL CORP. 34 Roosevelt Highway Colchester, Vermont 05446 (802) 654-9653	FIGURE 2 SITE PLAN Green Mountain Power Corp. Plant #4 Montpelier, Vermont



Project# 97038	Designed by: Checked by: Approved by: Drawn by: Scale: 1"=80' Date: 06/19/99	TWIN STATE ENVIRONMENTAL CORP. 34 Roosevelt Highway Colchester, Vermont 05446 (802) 654-9963	FIGURE 3 PROPOSD SOIL BORING LOCATIONS Green Mountain Power Corp. Plant #4 Montpelier, Vermont



Project# 97059	Designed by: Checked by: Approved by: Drawn by: Scale: 1"=80' Date: 08/19/99	TWIN STATE ENVIRONMENTAL CORP. 34 Roosevelt Highway Colchester, Vermont 05446 (802) 864-9893	FIGURE 4 PROPOSD MONITOR WELL LOCATIONS Green Mountain Power Corp. Plant #4 Montpelier, Vermont

ATTACHMENT 1

QUALITY ASSURANCE PROJECT PLAN

This document is a Quality Assurance Project Plan (QAPP) for conducting a soil boring, groundwater monitoring well installation and sampling program at the Green Mountain Power Corporation Plant #4 SITE in East Montpelier, Vermont. This QAPP is prepared to insure that the data obtained for this project is collected, handled, and analyzed properly.

I. Project Scope

The purpose of this project is to complete a site investigation program necessary to address potential dioxin contamination present in soils and building materials, and PCB contamination that is present in soils, building materials, and potentially groundwater and sediment at the SITE. The project will involve the advancement of soil borings, the installation of groundwater monitoring wells, and the collection groundwater elevation data, and the collection of and soil, sediment, building material, and groundwater samples for laboratory analyses.

II. Data Quality Objectives

The soil data collected during this project will be used to determine the degree and extent of PCB contamination to soils underlying the SITE. Groundwater, building material, and sediment samples will be used to determine whether other media have been contaminated by PCBs, and will aid in determining the degree and extent of the impact area(s). All data will be compared to risk-based exposure criteria to determine if a threat to human health or the environment exists at an unacceptable level. Building material samples will also be collected and analyzed for the presence of dioxins/furans due to a reported fire that occurred in the 1950's.

III. Laboratories

The following laboratories will be responsible for the analysis of environmental samples collected from the SITE:

Laboratory Name and Address	Analyses to be conducted
ChemServe, Inc. 317 Elm Street Milford, NH 03055	PCBs via US EPA Method 8082
Paradigm Analytical, Inc. 2627 Northchase Parkway Wilmington, NC 28405	Dioxins/Furans via US EPA Method 8290

IV. Project Responsibilities

The following individuals will be involved with this project:

Responsibility	Individuals	Phone Number
Project Coordination	Jon Berntsen, TSEC	(802) 654-8663
	John Diego, TSEC	(802) 654-8663
Environmental Sampling	Jon Berntsen, TSEC	(802) 654-8663
	Rod Lindsay II, TSEC	(802) 654-8663
	Chad Pidgeon, TSEC	(802) 654-8663
Laboratory Activities	Mr. Jay Chrystal, ChemServe	(603) 673-5440
	Dr. Yves Tondeur, Ph.D., Paradigm	(910) 350-1903

V. Analytical Methods/QA Summary Table

GREEN MOUNTAIN POWER CORPORATION
PLANT #4

Environmental Sampling Program
Analytical Methods/QA Summary Table

Category	Environmental Samples				Field Blank
Matrix	Soil	Groundwater	Sediment	Building Materials	Water
Sampling Frequency	Initial Round Only	To be determined	Initial Round Only	Initial Round Only	To be determined
Blanks per Round	N/A	N/A	N/A	N/A	One per groundwater sampling round
Analytical Parameters	PCBs	PCBs	PCBs	PCBs Dioxins	PCBs
Analytical Methods	US EPA Method 8082	US EPA Method 8082	US EPA Method 8082	US EPA Method 8082 - PCB US EPA Method 8290 - dioxin	US EPA Method 8082
Spikes	None	None	None	None	None
Duplicates	None	One	None	None	None
Splits	None	None	None	None	None
Performance Evaluation Samples	None	None	None	None	None
Sample Preservation	Cool (4°C)	Cool (4°C)	Cool (4°C)	Cool (4°C)	Cool (4°C)
Sample Volume	4 ounce	1 Liter	4 ounce	4 ounce – PCB 8 ounce - Dioxin	4 ounce
Sample Container	Glass	Glass	Glass	Glass	Glass
Holding Time	14 days for extraction 40 days for analysis	7 days	14 days for extraction 40 days for analysis	PCB – 14 days for extraction 40 days for analysis Dioxin – 30 day extraction, 45 day analysis	14 days for extraction 40 days for analysis

VI. Site-Specific Sampling Methods

All environmental samples will be collected in accordance with TSEC's Standard Operating Procedures (SOPs). These SOPs are presented at the end of this document and have been developed based upon industry accepted methodologies. Soil samples will be collected using Geoprobe® sampling equipment. All samples will be placed into laboratory supplied glassware

VII. Field Analytical Instrumentation

Calibration and preventative maintenance procedures for the field instrumentation to be utilized will be performed in accordance with the equipment manufacturer's specifications.

VIII. Duplicate and Split Sample Procedure

Neither duplicate nor split samples for soil, sediment, or building material analyses will be collected during the completion of this project. One (1) duplicate groundwater sample will be collected and analyzed for PCBs via US EPA Method 8082.

IX. Chain of Custody Procedures

A chain-of-custody (COC) form will be completed during the ground-water sampling round, and will accompany the sample container during shipment to the laboratory. The COC will bear the name and signature of the person assuming possession and responsibility for the samples. The COC will ensure accountability of the possession of the samples from the time of collection to the time of receipt by the laboratory. The COC will also include a description of the individual sample bottles and the analyses that are to be completed of the samples by the analytical laboratory.

X. Laboratory Storage Procedures

Upon receipt of laboratory samples by the laboratory, the sample containers will be checked in and stored in a secure refrigeration unit. The samples will remain in this secure location until analyses are completed.

XI. Laboratory Deliverables Format

All laboratory reports will be produced using standard Level I Reporting.

ATTACHMENT 2

ChemServe ENVIRONMENTAL ANALYSTS

317 Elm Street
Milford NH 03055
Tel (603) 673-5440
Fax (603) 673-0366

October 13, 1999

Mr. Jon Berntsen
Twin State Environmental
34 Roosevelt Hwy
Colchester VT 05446

Job Name	**: GMP Plant #4**	**Laboratory #**	**: 99090097**
Job #	**: 97038**	**Purchase Order #**	**: 97038**
Location	**: Montpelier, VT**	**Control #**	**: 30833, 30834, 30835, 30832**

Dear Mr. Berntsen

Enclosed please find the laboratory results for the above referenced samples which were received by the Chemserve sample custodian, under chain of custody control number 30833, 30834, 30835 & 30832 on September 10, 1999. Samples were collected by Jon Berntsen on September 8 & 9, 1999. Any abnormalities to the samples on receipt would be noted on the enclosed chain of custody document. This report is not valid without a completed Chemserve chain of custody with the corresponding control number, attached.

All samples analyzed by Chemserve are subjected to quality standards. These standards are either as stringent or more stringent than those established under 40 CFR Part 136, state certification programs, and corresponding methodologies. Chemserve has a written QA/QC Procedures Manual which outlines these standards, and is available, upon request, for your reference. Unless otherwise stated on the Chain of Custody or within the report, all holding times, preservation techniques, container types, and analytical methods are analogous with those outlined by the U.S. EPA.

I certify that I have reviewed the above referenced analytical data and state forms, and I have found this report within compliance with the procedures outlined in the Chemserve QA/QC Procedures Manual.

For
Ellen Abrams - QA/QC Administrator

Jay W. Chrystal - President/Laboratory Director

This report contains 34 pages

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: LD-3 0-3'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/20/99

LAB#: 99090097-04

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 73.8
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	230	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-01

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: DS-1 0-2'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/20/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 203.5
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	240	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-02

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: OR-1 0-2'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/20/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 208
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-03

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: LD-2 0-4'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/20/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 184.5
AROCLOR 1016/1242	1700	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	600	0.1
AROCLOR 1260	750	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: LD-3 0-3'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/20/99

LAB#: 99090097-04

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 73.8
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	230	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: SED-1

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/20/99

LAB#: 99090097-05

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 41.8
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-06

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: SED-2

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/20/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 40.0
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: LD-4 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/20/99

DATE REC'D: 09/10/99

MATRIX: Solid

LAB#: 99090097-07

JOB#: 97038

CONTROL#: 30832-30835

DATE ANALYZED: 10/05/99

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 187
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	470	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-08

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: LD-4 4-6'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/20/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 36.4
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-09

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: LD-5 0-4'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/20/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 36.9
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	130	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: LD-7 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/20/99

LAB#: 99090097-10

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/08/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 389
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-11

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: LD-8 0-4'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/21/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 762
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	640	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe ENVIRONMENTAL ANALYSTS

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: LD-9 4-8'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-12

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 45.8
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	9.5	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-1 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-13

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 1815
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-2 4-6'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-14

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 42.3
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	1.8	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-3 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-15

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 732
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	1200	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-3 4-8'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-16

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 740
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	1200	0.1

- Check -- CR-

BDL=BELOW DETECTION LIMIT NO PCBs -

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-17

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: RS-4 4-6'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/21/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 762
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-5 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-18

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 179
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	71	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-5 4-6'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-19

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 1484
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-7 4-5.5'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/21/99

LAB#: 99090097-20

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 808
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-9 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/22/99

LAB#: 99090097-21

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 308
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	150	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-11 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/22/99

LAB#: 99090097-22

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 37.0
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99090097-23

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: RS-12 4-8'

CONTROL#: 30832-30835

DATE SAMPLED: 09/08/99

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

DATE EXTRACTED: 09/22/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 383
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	72.2	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-13 0-3'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/22/99

DATE REC'D: 09/10/99

MATRIX: Solid

LAB#: 99090097-24

JOB#: 97038

CONTROL#: 30832-30835

DATE ANALYZED: 10/05/99

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 39.7
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: OT-1

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/22/99

LAB#: 99090097-25

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/08/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 692
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	3200	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-14 4-8'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/22/99

LAB#: 99090097-26

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/06/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 40.5
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-15 0-2'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/22/99

LAB#: 99090097-27

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/05/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 388
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

SAMPLE LOCATION: Montpelier, VT

SAMPLE IDENTITY: RS-16 0-4'

DATE SAMPLED: 09/08/99

DATE EXTRACTED: 09/22/99

LAB#: 99090097-28

JOB#: 97038

CONTROL#: 30832-30835

DATE REC'D: 09/10/99

DATE ANALYZED: 10/08/99

MATRIX: Solid

COMPOUND	CONCENTRATION (ug/Kg)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (ug/Kg) X 3900
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	80,000	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

Chain of Custody No. 30853 1 of 4

Multiple COC's (Yes) No

ChemServe ENVIRONMENTAL ANALYSIS

317 Elm Street Milford, NH 03055
(603) 673-5440/ Fax (603) 673-0366

CHAIN OF CUSTODY

A CUSTOMER INFORMATION

CUSTOMER: TWIN STATE ENVIRONMENTAL
ADDRESS: 34 ROOSEVELT HIGHWAY
CITY/STATE/ZIP: COLCHESTER VT 05446
TELEPHONE: (802) 654-8603
REPORT TO: JON BERNTSEN
P O NUMBER: 97038

B PROJECT INFORMATION

JOB NAME: GMP PLANT #4
JOB NUMBER: 97038
LOCATION: MONTPELIER VT
TELEPHONE: N/A
CONTACT: N/A
QUOTE NUMBER: AA28-99-02 Rev 1

C SAMPLE INFORMATION

TURNAROUND TIME: (CIRCLE ONE:)
(STANDARD) RUSH
RUSH T.A.T. _____ (CHECK w/LAB)

AMBER GLASS (AG) / GLASS (G) / PLASTIC (P)

STATION # (D)	SAMPLE IDENTIFICATION & LOCATION (E)	COLLECTED (F) DATE	COLLECTED (G) TIME	SAMPLE TYPE GRAB (H)	SAMPLE TYPE COMP (H)	MATRIX SOLID (S) LIQUID (L) COMBINED (C) HAZARD (H) (I)	# OF CONTAINERS (J)	CONTAINER AND PRESERVATIVE (K) 8 oz CLEAR GLASS	ANALYSIS (L)
01	DS-1 0-2'	9-8-99	915	✓		S	1	✓	US EPA METHOD 8082 (PCB ONLY)
02	OR-1 0-2'	9-8-99	945	✓		S	1	✓	
03	LD-2 0-4'	9-8-99	1100	✓		S	1	✓	
04	LD-3 0-3'	9-8-99	1115	✓		S	1	✓	
05	SED-1	9-8-99	1215	✓		S	1	✓	
06	SED-2	9-8-99	1225	✓		S	1	✓	
07	LD-4 0-4'	9-8-99	1240	✓		S	1	✓	
08	LD-4 4-6'	9-8-99	1255	✓		S	1	✓	

M CUSTODY

SAMPLER: JON BERNTSEN (print name)
SIGNATURE:

	DATE	MILITARY TIME
RELINQUISHED:	9-9-99	1600
RECEIVED:	9-10-99	1000
RELINQUISHED: VT Transit	9-10-99	1000
RECEIVED FOR LAB: Jobi Moorman	9/10/99	1615

SAMPLE CHECK LIST:
RECEIVED WITHIN HOLD TIME YES OR NO
RECEIVED IN GOOD CONDITION YES OR NO
TEMP BLANK _____ °C
SHIPPED OR HAND DELIVERED
SAMPLES WERE PROPERLY PRESERVED YES NO N/A
SAMPLES WERE FILTERED IN FIELD LAB N/A
IF NO EXPLAIN:

GROUP # 99090097 9/24

FIELD READING(S):

Chain of Custody No. 30554

Multiple COC's (Yes) No 2 of 4

ChemServe ENVIRONMENTAL ANALYSIS

317 Elm Street Milford, NH 03055
(603) 673-5440/ Fax (603) 673-0366

CHAIN OF CUSTODY

A CUSTOMER INFORMATION

CUSTOMER: TWIN STATE ENVIRONMENT
ADDRESS: 34 ROOSEVELT HWY
CITY/STATE/ZIP: COLCHESTER VT 05446
TELEPHONE: (802) 654-8063
REPORT TO: JON BERNTSEN
P O NUMBER: 97038

B PROJECT INFORMATION

JOB NAME: GMP PLANT #4
JOB NUMBER: 97038
LOCATION: MONTPELIER, VT
TELEPHONE: N/A
CONTACT: N/A
QUOTE NUMBER: AA28-99-02 Rev 1

C SAMPLE INFORMATION

TURNAROUND TIME: (CIRCLE ONE:)
(STANDARD) RUSH
RUSH T.A.T. _____ (CHECK w/LAB)
AMBER GLASS (AG) / GLASS (G) / PLASTIC (P)

STATION # (D)	SAMPLE IDENTIFICATION & LOCATION (E)	COLLECTED (F) DATE	COLLECTED (G) TIME	SAMPLE TYPE GRAB (H)	SAMPLE TYPE COMP (H)	MATRIX (I) SOLID (S) LIQUID (L) COMBINED (C) HAZARD (H)	# OF CONTAINERS (J)	CONTAINER AND PRESERVATIVE (K) 8 OZ CLEAR GLASS (AG)	ANALYSIS (L)
09	LD-5 0-4'	9-8-99	1315	✓		S	1	✓	USEPA Method 8082 (PCB ONLY)
10	LD-7 0-4	9-8-99	1400	✓		S	1	✓	
11	LD 8 0-4'	9-8-99	1415	✓		S	1	✓	
12	LD-9 4-8'	9-8-99	1440	✓		S	1	✓	
13	RS-1 0-4'	9-9-99	0815	✓		S	1	✓	
14	RS-2 4-6'	9-9-99	0840	✓		S	1	✓	
15	RS-3 0-4'	9-9-99	0845	✓		S	1	✓	
16	RS-3 4-8'	9-9-99	0850	✓		S	1	✓	

M CUSTODY

SAMPLER: JON BERNTSEN (print name)
SIGNATURE:

	DATE	MILITARY TIME
RELINQUISHED:	9-9-99	1600
RECEIVED:	9-10-99	1060
RELINQUISHED:	9.10.99	1000
RECEIVED FOR LAB: Via Transit	9.10.99	1001
	9/10/99	1015

SAMPLE CHECK LIST:

RECEIVED WITHIN HOLD TIME YES OR NO
RECEIVED IN GOOD CONDITION YES OR NO
TEMP BLANK _____ °C
SHIPPED OR HAND DELIVERED
SAMPLES WERE PROPERLY PRESERVED YES NO N/A
SAMPLES WERE FILTERED IN FIELD LAB N/A
IF NO EXPLAIN:

GROUP # 99090097 9/24

FIELD READING(S):

Chain of Custody No. 30835

Multiple COC's (Yes) No 3 of 4

ChemServe
ENVIRONMENTAL ANALYSIS

317 Elm Street Milford, NH 03055
(603) 673-5440/ Fax (603) 673-0366

CHAIN OF CUSTODY

A CUSTOMER INFORMATION

CUSTOMER: TWIN STATE ENVIRONMENTAL
ADDRESS: 34 ROOSEVELT HIGHWAY
CITY/STATE/ZIP: COLCHESTER VT 05446
TELEPHONE: (802) 654-8663
REPORT TO: JON BERNTSEN
P O NUMBER: 97038

B PROJECT INFORMATION

JOB NAME: GMP PLANT #4
JOB NUMBER: 97038
LOCATION: MONTPELIER VT
TELEPHONE: N/A
CONTACT: N/A
QUOTE NUMBER: AA28-99-02 Rev 1

C SAMPLE INFORMATION

TURNAROUND TIME: (CIRCLE ONE:)
(STANDARD) RUSH
RUSH T.A.T. _____ (CHECK w/LAB)

AMBER GLASS (AG) / GLASS (G) / PLASTIC (P)

STATION # (D)	SAMPLE IDENTIFICATION & LOCATION (E)	COLLECTED DATE (F)	COLLECTED TIME (G)	SAMPLE TYPE GRAB (H)	SAMPLE TYPE COMP (H)	MATRIX (I)	# OF CONTAINERS (J)	CONTAINER AND PRESERVATIVE (K) 8 oz Clear Glass	ANALYSIS (L)
17	RS-4 4-6'	9-9-99	0930	✓		S	1	✓	US EPA METHOD 8082 (PCBONLY)
18	RS-5 0-4'	9-9-99	940	✓		S	1	✓	
19	RS-5 4-6'	9-9-99	948	✓		S	1	✓	
20	RS-7 4-5.5'	9-9-99	1030	✓		S	1	✓	
21	RS-9 0-4'	9-9-99	1049	✓		S	1	✓	
22	RS-11 0-4'	9-9-99	1225	✓		S	1	✓	
23	RS-12 4-8'	9-9-99	1415	✓		S	1	✓	
24	RS-13 0-3'	9-9-99	1435	✓		S	1	✓	

M CUSTODY

SAMPLER: JON BERNTSEN (print name)
SIGNATURE:

	DATE	MILITARY TIME
RELINQUISHED:	9-9-99	1600
RECEIVED:	9-10-99	1000
*RELINQUISHED:	9-10-99	1001
RECEIVED FOR LAB: Jodi Moorman	9/10/99	1675

SAMPLE CHECK LIST:
RECEIVED WITHIN HOLD TIME YES OR NO
RECEIVED IN GOOD CONDITION YES OR NO
TEMP BLANK _____ °C
SHIPPED OR HAND DELIVERED
SAMPLES WERE PROPERLY PRESERVED YES NO N/A
SAMPLES WERE FILTERED IN FIELD LAB N/A
IF NO EXPLAIN:

GROUP # 99090097 9/24

FIELD READING(S):

Chain of Custody No. 30832 4 of 4

Multiple COC's (Yes) No

ChemServe
ENVIRONMENTAL ANALYSES

317 Elm Street Milford, NH 03055
(603) 673-5440/ Fax (603) 673-0366

CHAIN OF CUSTODY

A CUSTOMER INFORMATION

CUSTOMER: TWIN STATE ENVIRONMENTAL
ADDRESS: 34 ROOSEVELT HIGHWAY
CITY/STATE/ZIP: COLCHESTER VT 05446
TELEPHONE: (802) 654-8663
REPORT TO: JON BERNTSEN
P O NUMBER: 97038

B PROJECT INFORMATION

JOB NAME: GMP PLANT #4
JOB NUMBER: 97038
LOCATION: MONTPELIER, VT
TELEPHONE: N/A
CONTACT: N/A
QUOTE NUMBER: AA26-99-02 KONG

C SAMPLE INFORMATION

TURNAROUND TIME: (CIRCLE ONE:)
(STANDARD) RUSH
RUSH T.A.T. _____ (CHECK w/LAB)
AMBER GLASS (AG) / GLASS (G) / PLASTIC (P)

STATION # (D)	SAMPLE IDENTIFICATION & LOCATION (E)	COLLECTED DATE (F)	COLLECTED TIME (G)	SAMPLE TYPE GRAB (H)	SAMPLE TYPE COMP (H)	MATRIX (I)	# OF CONTAINERS (J)	CONTAINER AND PRESERVATIVE (K) 8 oz CLEAR GLASS	ANALYSIS (L)
25	OT-1	9-9-99	1425		✓	S	1		USEPA METHOD 8082 (PCB ONLY)
26	RS-14 4-8'	9-9-99	1500	✓		S	1		
27	RS-15 0-2'	9-9-99	1515	✓		S	1		
28	RS-16 0-4'	9-9-99	1520	✓		S	1		
		DATE	TIME	✓					
		DATE	TIME	✓					
		DATE	TIME	✓					
		DATE	TIME	✓					

M CUSTODY

		DATE	MILITARY TIME
SAMPLER: JON BERNTSEN (print name)			
SIGNATURE:		9-9-99	1630
RELINQUISHED:		9-10-99	1000
RECEIVED:		9.10.99	1000
RELINQUISHED		9.10.99	001
RECEIVED FOR LAB:		9/10/99	1615

SAMPLE CHECK LIST:
RECEIVED WITHIN HOLD TIME YES OR NO
RECEIVED IN GOOD CONDITION YES OR NO
TEMP BLANK _____ °C
SHIPPED OR HAND DELIVERED
SAMPLES WERE PROPERLY PRESERVED YES NO N/A
SAMPLES WERE FILTERED IN FIELD LAB N/A
IF NO EXPLAIN:

GROUP # 99090097 9/24

FIELD READING(S):

The State of New Hampshire
Department of Environmental Services

CERTIFICATE OF APPROVAL
Drinking Water Analysis

Issued to
Chemserve, Inc.

Located at
317 Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300 for the following analyses:

FULL CERTIFICATION: Metals by ICP, Herbicides (Compliance List), Organic Disinfection By-Products, Trihalomethanes, Metals by Graphite Furnace, Volatile Organics, Insecticides (Compliance List), Turbidity, E. coli by Colilert/Colisure, Sodium, Total Cyanide, Total Filterable Residue, Calcium Hardness, Alkalinity, Coliform (Compliance Testing), Total Coliform by MF, EDB, Residual Free Chlorine, Total Coliform by Colilert/Colisure, DBCP, Vinyl Chloride, Nitrite-N, Fluoride, Nitrate-N, Fecal Coliform by MF.

PROVISIONAL CERTIFICATION: Carbamates, Base/Neutrals, Bromide, Mercury, pH, Sulfate, Vydate.

REPLACES CERTIFICATE #: 100898-A

CERTIFICATE NUMBER: 100898-D

DATE OF ISSUE: March 22, 1999

Certifying Officer

EXPIRATION DATE: December 02, 1999

The State of New Hampshire
Department of Environmental Services

CERTIFICATE OF APPROVAL
Wastewater Analysis

Issued to
Chemserve, Inc.

Located at
317 Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300 for the following analyses:

FULL CERTIFICATION: Metals by Graphite Furnace, Volatile Organics, Pesticides, PCB's in Oil, PCB's in Water, Metals by ICP, Magnesium, Mercury, Specific Conductance, Total Hardness, Potassium, Total Alkalinity, Chloride, Fecal Coliform by MF, Total Coliform by MF, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Calcium, TDS, TKN, Total Residual Chlorine, Total Phenolics, Oil & Grease (Freon), Non-Filterable Residue, Total Cyanide, pH, 5-Day BOD, Total Phosphorus, Orthophosphate, Sodium, COD.

PROVISIONAL CERTIFICATION: Oil & Grease (Method 1664).

REPLACES CERFICATE #: 100898-B

CERTIFICATE NUMBER: 100898-C

DATE OF ISSUE: December 11, 1998

Certifying Officer

EXPIRATION DATE: December 02, 1999

OCT 25 1999

ChemServe
ENVIRONMENTAL ANALYSTS

317 Elm Street
Milford NH 03055
Tel (603) 673-5440
Fax (603) 673-0366

October 21, 1999

Mr. Jon Berntsen
Twin State Environmental
34 Roosevelt Hwy
Colchester VT 05446

Job Name	**: GMP Plant #4**	**Laboratory #**	**: 99100100**
Job #	**: 97038**	**Purchase Order #**	**: 97038**
Location	**: Montpelier VT**	**Control #**	**: 28192**

Dear Mr. Berntsen

Enclosed please find the laboratory results for the above referenced samples which were received by the Chemserve sample custodian, under chain of custody control number 28192 on 10/13/99. Samples were collected by Jon Berntsen on 10/05/99. Any abnormalities to the samples on receipt would be noted on the enclosed chain of custody document. This report is not valid without a completed Chemserve chain of custody with the corresponding control number, attached.

All samples analyzed by Chemserve are subjected to quality standards. These standards are either as stringent or more stringent than those established under 40 CFR Part 136, state certification programs, and corresponding methodologies. Chemserve has a written QA/QC Procedures Manual which outlines these standards, and is available, upon request, for your reference. Unless otherwise stated on the Chain of Custody or within the report, all holding times, preservation techniques, container types, and analytical methods are analogous with those outlined by the U.S. EPA.

I certify that I have reviewed the above referenced analytical data and state forms, and I have found this report within compliance with the procedures outlined in the Chemserve QA/QC Procedures Manual.

Ellen Abrams - QA/QC Administrator

Jay W. Chrystal - President/Laboratory Director

This report contains 9 pages

CHEMSERVE QUALITY ASSURANCE SEAL ENVIRONMENTAL ANALYSTS

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99100100-01

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: RS-17 0-4'

CONTROL#: 28192

DATE SAMPLED: 10/05/99

DATE REC'D:10/12/99

DATE ANALYZED: 10/19/99

DATE EXTRACTED: 10/15/99

MATRIX: Solid

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (UG/KG) X 37.0
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	BDL	0.1

BDL = BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99100100-02

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: RS-18 0-4'

CONTROL#: 28192

DATE SAMPLED: 10/05/99

DATE REC'D:10/12/99

DATE ANALYZED: 10/19/99

DATE EXTRACTED: 10/15/99

MATRIX: Solid

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (UG/KG) X 38.9
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	12,000	0.1
AROCLOR 1260	BDL	0.1

BDL = BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99100100-03

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: RS-20 0-4'

CONTROL#: 28192

DATE SAMPLED: 10/05/99

DATE REC'D:10/12/99

DATE ANALYZED: 10/19/99

DATE EXTRACTED: 10/15/99

MATRIX: Solid

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (UG/KG) X 39.5
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	9100	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99100100-04

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: RS-20 4-6'

CONTROL#: 28192

DATE SAMPLED: 10/05/99

DATE REC'D:10/12/99

DATE ANALYZED: 10/19/99

DATE EXTRACTED: 10/15/99

MATRIX: Solid

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (UG/KG) X 37.5
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	22000	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99100100-05

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: RS-19 0-3'

CONTROL#: 28192

DATE SAMPLED: 10/05/99

DATE REC'D:10/12/99

DATE ANALYZED: 10/19/99

DATE EXTRACTED: 10/15/99

MATRIX: Solid

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (UG/KG) X37.8
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	BDL	0.1
AROCLOR 1260	610000	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99100100-06

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: FS-1 0-4'

CONTROL#: 28192

DATE SAMPLED: 10/05/99

DATE REC'D:10/12/99

DATE ANALYZED: 10/19/99

DATE EXTRACTED: 10/15/99

MATRIX: Solid

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (UG/KG) X 36.9
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	20000	0.1
AROCLOR 1260	BDL	0.1

BDL = BELOW DETECTION LIMIT

ANALYZED BY: JM

ChemServe

PCB
EPA METHOD 8082

CUSTOMER: Twin State Environmental

LAB#: 99100100-07

SAMPLE LOCATION: Montpelier, VT

JOB#: 97038

SAMPLE IDENTITY: FS-2 0-4'

CONTROL#: 28192

DATE SAMPLED: 10/05/99

DATE REC'D:10/12/99

DATE ANALYZED: 10/19/99

DATE EXTRACTED: 10/15/99

MATRIX: Solid

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT BASED ON PQL DETECTION LIMIT MULTIPLIER: (UG/KG) X39.3
AROCLOR 1016/1242	BDL	0.1
AROCLOR 1221	BDL	0.2
AROCLOR 1232	BDL	0.1
AROCLOR 1248	BDL	0.1
AROCLOR 1254	110000	0.1
AROCLOR 1260	BDL	0.1

BDL=BELOW DETECTION LIMIT

ANALYZED BY: JM

Chain of Custody No. 28192

Multiple COC's Yes No

ChemServe
ENVIRONMENTAL ANALYSIS

317 Elm Street Milford, NH 03055
(603) 673-5440/ Fax (603) 673-0366

CHAIN OF CUSTODY

A CUSTOMER INFORMATION

CUSTOMER: TWIN STATE ENVIRONMENTAL
ADDRESS: 34 ROOSEVELT HIGHWAY
CITY/STATE/ZIP: COLCHESTER VT 05446
TELEPHONE: (802) 654-8163
REPORT TO: JON BERNTSEN
P O NUMBER: 97038

B PROJECT INFORMATION

JOB NAME: GMP PLANT #4
JOB NUMBER: 97038
LOCATION: MONTPELIER VT
TELEPHONE: N/A
CONTACT: N/A
QUOTE NUMBER: AA28-99-02 Rev.1

C SAMPLE INFORMATION

TURNAROUND TIME: (CIRCLE ONE:)
STANDARD * SEE BELOW RUSH
RUSH T.A.T. _____ (CHECK w/LAB)
AMBER GLASS (AG) / GLASS (G) / PLASTIC (P)

STATION # (D)	SAMPLE IDENTIFICATION & LOCATION (E)	COLLECTED DATE (F)	COLLECTED TIME (G)	SAMPLE TYPE GRAB (H)	SAMPLE TYPE COMP (H)	MATRIX (I)	# OF CONTAINERS (J)	CONTAINER AND PRESERVATIVE (K) 4 oz GLASS	ANALYSIS (L)
	RS-17 0-4'	10/5/99	1015	X		S	1	X	USEPA METHOD 8082 PCB
	RS-18 0-4'	10/5/99	1035	X		S	1	X	
	RS-20 0-4	10/5/99	1059	X		S	1	X	
	RS 20 ~~DUP~~ 4-6'	10/5/99	1105	X		S	1	X	
	RS-19 0-3'	10/5/99	1130	X		S	1	X	
	FS-1 0-4'	10/5/99	1255	X		S	1	X	
	FS-2 0-4'	10/5/99	1320	X		S	1	X	
		DATE	TIME						

M CUSTODY

SAMPLER: JON BERNTSEN (print name)
SIGNATURE:

	DATE	MILITARY TIME
RELINQUISHED:	10/5/99	15:30
RECEIVED:	10/7/99	910
RELINQUISHED:	DATE	TIME
RECEIVED FOR LAB:	DATE	TIME
	10/13/99	

SAMPLE CHECK LIST:
RECEIVED WITHIN HOLD TIME (YES) OR NO
RECEIVED IN GOOD CONDITION (YES) OR NO
TEMP BLANK ____ °C
SHIPPED OR HAND DELIVERED
SAMPLES WERE PROPERLY PRESERVED. YES NO (N/A)
SAMPLES WERE FILTERED IN FIELD LAB (N/A)
IF NO EXPLAIN:

GROUP # 99100860 10/18

FIELD READING(S):
* NEED DATA BY 10/18 - END OF DAY!

The State of New Hampshire
Department of Environmental Services

CERTIFICATE OF APPROVAL
Drinking Water Analysis

Issued to
Chemserve, Inc.

Located at
317 Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300 for the following analyses:

FULL CERTIFICATION: Metals by ICP, Herbicides (Compliance List), Organic Disinfection By-Products, Trihalomethanes, Metals by Graphite Furnace, Volatile Organics, Insecticides (Compliance List), Turbidity, E. coli by Colilert/Colisure, Sodium, Total Cyanide, Total Filterable Residue, Calcium Hardness, Alkalinity, Coliform (Compliance Testing), Total Coliform by MF, EDB, Residual Free Chlorine, Total Coliform by Colilert/Colisure, DBCP, Vinyl Chloride, Nitrite-N, Fluoride, Nitrate-N, Fecal Coliform by MF.

PROVISIONAL CERTIFICATION: Carbamates, Base/Neutrals, Bromide, Mercury, pH, Sulfate, Vydate.

REPLACES CERTIFICATE #: 100898-A

CERTIFICATE NUMBER: 100898-D

DATE OF ISSUE: March 22, 1999

EXPIRATION DATE: December 02, 1999

Certifying Officer

The State of New Hampshire
Department of Environmental Services

CERTIFICATE OF APPROVAL
Wastewater Analysis

Issued to
Chemserve, Inc.

Located at
317 Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300 for the following analyses:

FULL CERTIFICATION: Metals by Graphite Furnace, Volatile Organics, Pesticides, PCB's in Oil, PCB's in Water, Metals by ICP, Magnesium, Mercury, Specific Conductance, Total Hardness, Potassium, Total Alkalinity, Chloride, Fecal Coliform by MF, Total Coliform by MF, Fluoride, Sulfate, Ammonia-N, Nitrate-N, Calcium, TDS, TKN, Total Residual Chlorine, Total Phenolics, Oil & Grease (Freon), Non-Filterable Residue, Total Cyanide, pH, 5-Day BOD, Total Phosphorus, Orthophosphate, Sodium, COD.

PROVISIONAL CERTIFICATION: Oil & Grease (Method 1664).

REPLACES CERFICATE #: 100898-B

CERTIFICATE NUMBER: 100898-C

DATE OF ISSUE: December 11, 1998

EXPIRATION DATE: December 02, 1999

Certifying Officer

ATTACHMENT 3

PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

05 OCT 99

Mr. Jon Berntsen
Twin State Environmental
34 Roosevelt Highway
Colchester, VT 05446

Ph.: 802-654-8663
FAX: 802-654-8667

Subject: Polychlorinated Dibenzo-*p*-Dioxins & Dibenzofurans Measurements

Dear Mr. Berntsen;

Enclosed are the final results for the two solid samples received by Paradigm Analytical Labs on September 13, 1999. The analytical procedures conformed to or exceeded the ones described in Method 8290. The Level I reporting format is composed of this cover letter, summary topsheets for the Laboratory Method Blank (LMB), the samples, and a copy of the chain-of-custody. Table 1 summarizes the analytical data.

No. of Samples Received:	**2 Solids**
No. of Samples Analyzed:	**2**
No. of Lab. Method Blanks:	**1 (LMB)**
Your Project Number:	**97038.10**
PAL Project No.:	**G374-1**

Remarks:

- **Data meet QA/QC requirements.**

Thank you for the opportunity to serve you. Please feel free to contact us if you have questions or should you need additional technical support.

Sincerely,

Martha Maier

Martha M. Maier

Table 1: Analyte Concentrations in "ppt"

Analyte	LMB	Doorway #1	East Wall
2,3,7,8-TCDD	(0.133)	(0.156)	(0.123)
1,2,3,7,8-PeCDD	(0.100)	[0.869]	(0.101)
1,2,3,4,7,8-HxCDD	(0.154)	1.91	(0.230)
1,2,3,6,7,8-HxCDD	(0.162)	12.8	0.482
1,2,3,7,8,9-HxCDD	(0.146)	4.32	(0.218)
1,2,3,4,6,7,8-HpCDD	(0.176)	415	4.58
OCDD	1.22	3260	22.5
2,3,7,8-TCDF[a]	(0.100)	0.499	[0.406]
1,2,3,7,8-PeCDF	(0.0650)	0.328	0.195
2,3,4,7,8-PeCDF	(0.0636)	1.34	1.05
1,2,3,4,7,8-HxCDF	(0.149)	2.62	0.470
1,2,3,6,7,8-HxCDF	(0.142)	3.07	0.338
2,3,4,6,7,8-HxCDF	(0.159)	5.96	0.513
1,2,3,7,8,9-HxCDF	(0.174)	(1.10)	(0.193)
1,2,3,4,6,7,8-HpCDF	(0.157)	144	3.55
1,2,3,4,7,8,9-HpCDF	(0.191)	8.42	(0.237)
OCDF	(0.306)	396	3.22
Total TCDDs	(0.133)	(0.156)	(0.123)
Total PeCDDs	[0.212]	3.69	[0.764]
Total HxCDDs	[0.234]	46.0	2.19
Total HpCDDs	(0.176)	643	8.42
Total TCDFs	(0.100)	1.27	0.531
Total PeCDFs	(0.0636)	18.8	9.65
Total HxCDFs	(0.142)	101	10.4
Total HpCDFs	(0.157)	424	8.43
Total PCDD/Fs[b]	1.22	4890	65.3
TEQ (ND=0)[c]	0.0012	13.1	0.822
TEQ (ND=1/2)[d]	0.173	13.3	0.950
TEQ EMPC (ND=0)[e]	0.0012	13.6	0.863
TEQ EMPC (ND=1/2)	0.173	13.7	0.983

a) When applicable, the result is obtained from an isomer-specific analysis.
b) Total PCDD/Fs represent the sum of all polychlorinated dibenzo-p-dioxins & dibenzofurans.
c) TEQ computed using ITEF and setting non detected analytes with a "Zero" concentration.
d) TEQ computed using ITEF and setting non detected analytes with a concentration half the calculated detection limit.
e) TEQ computed using ITEF and setting the concentration of EMPC analytes to the EMPC value.

NOTE:
( ) = ND using DL value.
[ ] = EMPC value.

Method 8290 - QC BLANK Results

LMB

Analytical Data Summary Sheet

Analyte	Amount (ppt)	DL (ppt)	EMPC (ppt)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.119		29:36	0.45	
1,2,3,7,8-PeCDD	ND	0.0844		33:14	0.68	
1,2,3,4,7,8-HxCDD	ND	0.108		35:40	2.16	
1,2,3,6,7,8-HxCDD	ND	0.113		35:46	2.52	
1,2,3,7,8,9-HxCDD	ND	0.102		35:58	0.67	
1,2,3,4,6,7,8-HpCDD	ND	0.139		38:43	0.9	
OCDD	EMPC	0.193	1.40	42:29	0.74	
2,3,7,8--TCDF	ND	0.0812				
1,2,3,7,8-PeCDF	ND	< 0.0500				
2,3,4,7,8-PeCDF	ND	< 0.0500		33:05	1.14	
1,2,3,4,7,8-HxCDF	ND	0.0542		35:00	0.89	
1,2,3,6,7,8-HxCDF	ND	0.0518		35:05	0.83	
2,3,4,6,7,8-HxCDF	ND	0.0576		35:33	2.17	
1,2,3,7,8,9-HxCDF	ND	0.0632		36:16	2.25	
1,2,3,4,6,7,8-HpCDF	ND	0.0748				
1,2,3,4,7,8,9-HpCDF	ND	0.0912				
OCDF	ND	0.111		42:46	0.89	
Total TCDDs	ND	0.119				
Total PeCDDs	0.278	0.0844	0.502			
Total HxCDDs	ND	0.102	0.578			
Total HpCDDs	ND	0.139				
Total TCDFs	ND	0.0812				
Total PeCDFs	ND	< 0.0500				
Total HxCDFs	ND	0.0518				
Total HpCDFs	ND	0.0748				
TEQ (ND=0)	0.0000		0.0014			ITEF
TEQ (ND=½)	0.128		0.129			ITEF

Laboratory Information

Sample ID: WG3026-1

Extraction Date: 20-Sep-99
Analysis Date: 24-Sep-99

Sample Information

Matrix:	Soil	
Weight / Volume:	10.0	Grams
Moisture / Lipids:	NA	%
Original pH :	NA	
Filename:	a23sep99a_2-2	
Retchk:	a23sep99a-15	
Begin ConCal:	a23sep99a-15	
End ConCal:	a23sep99a_2-11	
Initial Cal:	m8290-052699m	

Method 8290 - QC BLANK Results

LMB

Analytical Data Summary Sheet

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.67	83.5	29:35	0.78	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.86	93.0	33:15	1.54	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.83	91.5	35:44	1.18	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.79	89.5	38:42	1.03	
$^{13}C_{12}$-OCDD	4	3.46	86.5	42:28	0.87	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.50	75.0	28:39	0.83	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.71	85.5	32:29	1.59	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.64	82.0	35:05	0.49	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.60	80.0	37:34	0.45	
Cleanup Standards						
$^{37}Cl_4$-2,3,7,8-TCDD	2	1.55	77.5	29:36		
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	2.00	100.0	33:04	1.6	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.75	87.5	35:39	1.18	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.59	79.5	34:59	0.48	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.82	91.0	39:17	0.47	
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD				28:52	0.8	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD				35:56	1.17	

Laboratory Information

Sample ID: WG3026-1

Extraction Date: 20-Sep-99
Analysis Date: 24-Sep-99

Reviewed by: MM

Sample Information

Matrix: Soil
Weight / Volume: 10.0 Grams
Moisture / Lipids: NA %
Original pH : NA

Filename: a23sep99a_2-2
Retchk: a23sep99a-15
Begin ConCal: a23sep99a-15
End ConCal: a23sep99a_2-11
Initial Cal: m8290-052699m

Date Reviewed: 9/24/99

Method 8290

Doorway #1

Twin State Environmental Corp.

Analytical Data Summary Sheet

Analyte	Amount (ppt)	DL (ppt)	EMPC (ppt)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.156				
1,2,3,7,8-PeCDD	EMPC	0.108	0.869	34:07	0.67	
1,2,3,4,7,8-HxCDD	1.91	0.183		36:43	1.19	
1,2,3,6,7,8-HxCDD	12.8	0.193		36:48	1.15	
1,2,3,7,8,9-HxCDD	4.32	0.174		37:02	1.23	
1,2,3,4,6,7,8-HpCDD	415	0.209		40:06	1.03	
OCDD	3260	0.350		44:19	0.88	
2,3,7,8--TCDF	0.499	0.221		30:31	0.78	
1,2,3,7,8-PeCDF	0.328	0.0936		33:18	1.46	
2,3,4,7,8-PeCDF	1.34	0.0915		33:56	1.53	
1,2,3,4,7,8-HxCDF	2.62	0.946		36:00	1.16	
1,2,3,6,7,8-HxCDF	3.07	0.902		36:06	1.18	
2,3,4,6,7,8-HxCDF	5.96	1.00		36:36	1.27	
1,2,3,7,8,9-HxCDF	ND	1.10				
1,2,3,4,6,7,8-HpCDF	144	0.105		38:51	1.04	
1,2,3,4,7,8,9-HpCDF	8.42	0.128		40:46	1.05	
OCDF	396	0.237		44:37	0.85	
Total TCDDs	ND	0.156				
Total PeCDDs	3.69	0.108	5.12			
Total HxCDDs	46.0	0.193	47.6			
Total HpCDDs	643	0.209				
Total TCDFs	1.27	0.221	2.97			
Total PeCDFs	18.8	0.0936	19.3			
Total HxCDFs	101	1.10				
Total HpCDFs	424	0.128	425			
TEQ (ND=0)	13.1		13.6			ITEF
TEQ (ND=½)	13.3		13.7			ITEF

Client Information

Project Name:	GMP Plant #4 97038.10
Sample ID:	Doorway #1

Laboratory Information

Project ID:	G374-1
Sample ID:	72272
Collection Date:	08-Sep-99
Receipt Date:	13-Sep-99
Extraction Date:	20-Sep-99
Analysis Date:	03-Oct-99

Sample Information

Matrix:	Solid	
Weight / Volume:	10.1	Grams
Moisture / Lipids:	0.0	%
Original pH :	NA	
Filename:	a02oct99a-13	
Retchk:	a02oct99a-1	
Begin ConCal:	a02oct99a-1	
End ConCal:	a02oct99a-15	
Initial Cal:	m8290-052699m	

Method 8290

Doorway #1

Twin State Environmental Corp.

Analytical Data Summary Sheet

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (mm.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.43	71.5	31:13	0.74	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.87	93.5	34:06	1.58	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.97	98.5	36:47	1.18	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.93	96.5	40:05	1.04	
$^{13}C_{12}$-OCDD	4	3.68	92.0	44:18	0.86	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.31	65.5	30:30	0.85	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.63	81.5	33:18	1.7	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.88	94.0	36:06	0.5	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.73	86.5	38:50	0.44	
Cleanup Standards						
$^{37}Cl_4$-2,3,7,8-TCDD	2	1.35	67.5	31:14		
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.82	91.0	33:55	1.66	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.75	87.5	36:42	1.17	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.66	83.0	36:00	0.49	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.76	88.0	40:45	0.45	
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD				30:42	0.75	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD				37:02	1.18	

Client Information

Project Name:	GMP Plant #4 97038.10
Sample ID:	Doorway #1

Laboratory Information

Project ID:	G374-1
Sample ID:	72272
Collection Date:	08-Sep-99
Receipt Date:	13-Sep-99
Extraction Date:	20-Sep-99
Analysis Date:	03-Oct-99

Sample Information

Matrix:	Solid	
Weight / Volume:	10.1	Grams
Moisture / Lipids:	0.0	%
Original pH :	NA	
Filename:	a02oct99a-13	
Retchk:	a02oct99a-1	
Begin ConCal:	a02oct99a-1	
End ConCal:	a02oct99a-15	
Initial Cal:	m8290-052699m	

Reviewed by: JMR Date Reviewed: 10/5/99

Method 8290

East Wall

Twin State Environmental Corp.

Analytical Data Summary Sheet

Analyte	Amount (ppt)	DL (ppt)	EMPC (ppt)	RT (min.)	Ratio	Qualifier
2,3,7,8--TCDD	ND	0.123				
1,2,3,7,8-PeCDD	ND	0.101				
1,2,3,4,7,8-HxCDD	ND	0.230				
1,2,3,6,7,8-HxCDD	0.482	0.242		36:48	1.13	
1,2,3,7,8,9-HxCDD	ND	0.218				
1,2,3,4,6,7,8-HpCDD	4.58	0.201		40:06	1.05	
OCDD	22.5	0.522		44:19	0.87	
2,3,7,8--TCDF	EMPC	0.155	0.406	30:31	1.04	
1,2,3,7,8-PeCDF	0.195	0.103		33:18	1.44	
2,3,4,7,8-PeCDF	1.05	0.100		33:56	1.48	
1,2,3,4,7,8-HxCDF	0.470	0.166		36:00	1.10	
1,2,3,6,7,8-HxCDF	0.338	0.158		36:06	1.26	
2,3,4,6,7,8-HxCDF	0.513	0.176		36:36	1.36	
1,2,3,7,8,9-HxCDF	ND	0.193				
1,2,3,4,6,7,8-HpCDF	3.55	0.155		38:51	1.11	
1,2,3,4,7,8,9-HpCDF	ND	0.237				
OCDF	3.22	0.292		44:36	0.84	
Total TCDDs	ND	0.123				
Total PeCDDs	ND	0.101	0.764			
Total HxCDDs	2.19	0.242				
Total HpCDDs	8.42	0.201				
Total TCDFs	0.531	0.155	3.29			
Total PeCDFs	9.65	0.103	9.76			
Total HxCDFs	10.4	0.193				
Total HpCDFs	8.43	0.237				
TEQ (ND=0)	0.822		0.863			ITEF
TEQ (ND=½)	0.950		0.983			ITEF

Client Information

Project Name:	GMP Plant #4 97038.10
Sample ID:	East Wall

Laboratory Information

Project ID:	G374-1
Sample ID:	72273
Collection Date:	08-Sep-99
Receipt Date:	13-Sep-99
Extraction Date:	20-Sep-99
Analysis Date:	03-Oct-99

Sample Information

Matrix:	Solid	
Weight / Volume:	10.1	Grams
Moisture / Lipids:	0.4	%
Original pH :	NA	
Filename:	a02oct99a-14	
Retchk:	a02oct99a-1	
Begin ConCal:	a02oct99a-1	
End ConCal:	a02oct99a-15	
Initial Cal:	m8290-052699m	

Method 8290

East Wall

Twin State Environmental Corp.

Analytical Data Summary Sheet

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (mm.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	2	1.63	81.5	31:13	0.74	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2	1.92	96.0	34:06	1.57	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2	1.91	95.5	36:47	1.18	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2	1.80	90.0	40:05	1.04	
$^{13}C_{12}$-OCDD	4	2.77	69.3	44:18	0.82	
$^{13}C_{12}$-2,3,7,8-TCDF	2	1.55	77.5	30:30	0.83	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2	1.72	86.0	33:18	1.68	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2	1.86	93.0	36:06	0.51	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2	1.65	82.5	38:49	0.44	
Cleanup Standards						
$^{37}Cl_4$-2,3,7,8-TCDD	2	1.46	73.0	31:14		
$^{13}C_{12}$-2,3,4,7,8-PeCDF	2	1.74	87.0	33:55	1.68	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	2	1.65	82.5	36:42	1.18	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	2	1.61	80.5	36:00	0.51	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	2	1.58	79.0	40:44	0.43	
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD				30:42	0.74	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD				37:02	1.18	

Client Information

Project Name:	GMP Plant #4 97038.10
Sample ID:	East Wall

Laboratory Information

Project ID:	G374-1
Sample ID:	72273
Collection Date:	08-Sep-99
Receipt Date:	13-Sep-99
Extraction Date:	20-Sep-99
Analysis Date:	03-Oct-99

Sample Information

Matrix:	Solid	
Weight / Volume:	10.1	Grams
Moisture / Lipids:	0.4	%
Original pH :	NA	
Filename:	a02oct99a-14	
Retchk:	a02oct99a-1	
Begin ConCal:	a02oct99a-1	
End ConCal:	a02oct99a-15	
Initial Cal:	m8290-052699m	

Reviewed by: JLM Date Reviewed: 10/5/99

TWIN STATE ENVIRONMENTAL

CHAIN OF CUSTODY RECORD No. 97038.10

34 Roosevelt Highway • Colchester, Vermont 05446
(802) 654-8663 Fax: (802) 654-8667

CLIENT INFORMATION

Twin State Environmental Corporation
Company Name
34 Roosevelt Highway
Address
Colchester Vermont 05446
City, State Zip
Send Report to:
Jon Berntsen
Phone #: (802) 654-8663

PROJECT INFORMATION

97038.10
Project #:
Montpelier, Vermont
Location
GMP Plant #4
Project Name

(802) 654-8667
Fax #:

RECEIVING LABORATORY INFORMATION

Paradigm Analytical Laboratories, Inc.
Name
2627 Northchase Parkway Wilmington, NC 28405
Address City State Zip
Phone # (910) 350-2839

CONTAINER TYPE
P – PLASTIC
G – GLASS
V – VOA
T – Tedlar bag
O - Other

MATRIX CODES
DW – DRINKING WATER
GW – GROUNDWATER
WW – WASTEWATER
SO – SOIL
SL – SLUDGE
OI – OIL
LIQ – OTHER LIQUID
SOL – OTHER SOLID

LAB #	SAMPLE IDENTIFICATION	SAMPLE INFORMATION					REQUESTED ANALYSES	REMARKS
		DATE/TIME	SAMPLER	MATRIX	CONTAINER TYPE	CONTAINER SIZE		
	DOORWAY #1	9/8/99/1005	JB	SOL	G	8oz	EPA METHOD 8290 - DIOXIN	QUOTE #
	EAST WALL	9/8/99/1000	JB	SOL	G	8oz	" " " "	17AUG99-YT-335

G37H1

RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:	RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:
9-10-99/1225	FEDEX Erica L. Price 9/13/99 10:25		