FINAL REPORT
REMEDIAL INVESTIGATION
ACCURATE DIE CASTING FACILITY
FAYETTEVILLE, NEW YORK

Prepared for

ITT COMMERCIAL FINANCE CORPORATION

Prepared by

STEARNS & WHELER
Environmental Engineers and Scientists
One Remington Park Drive
Cazenovia, NY 13035

December 1993

Project No. 2125

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 GENERAL

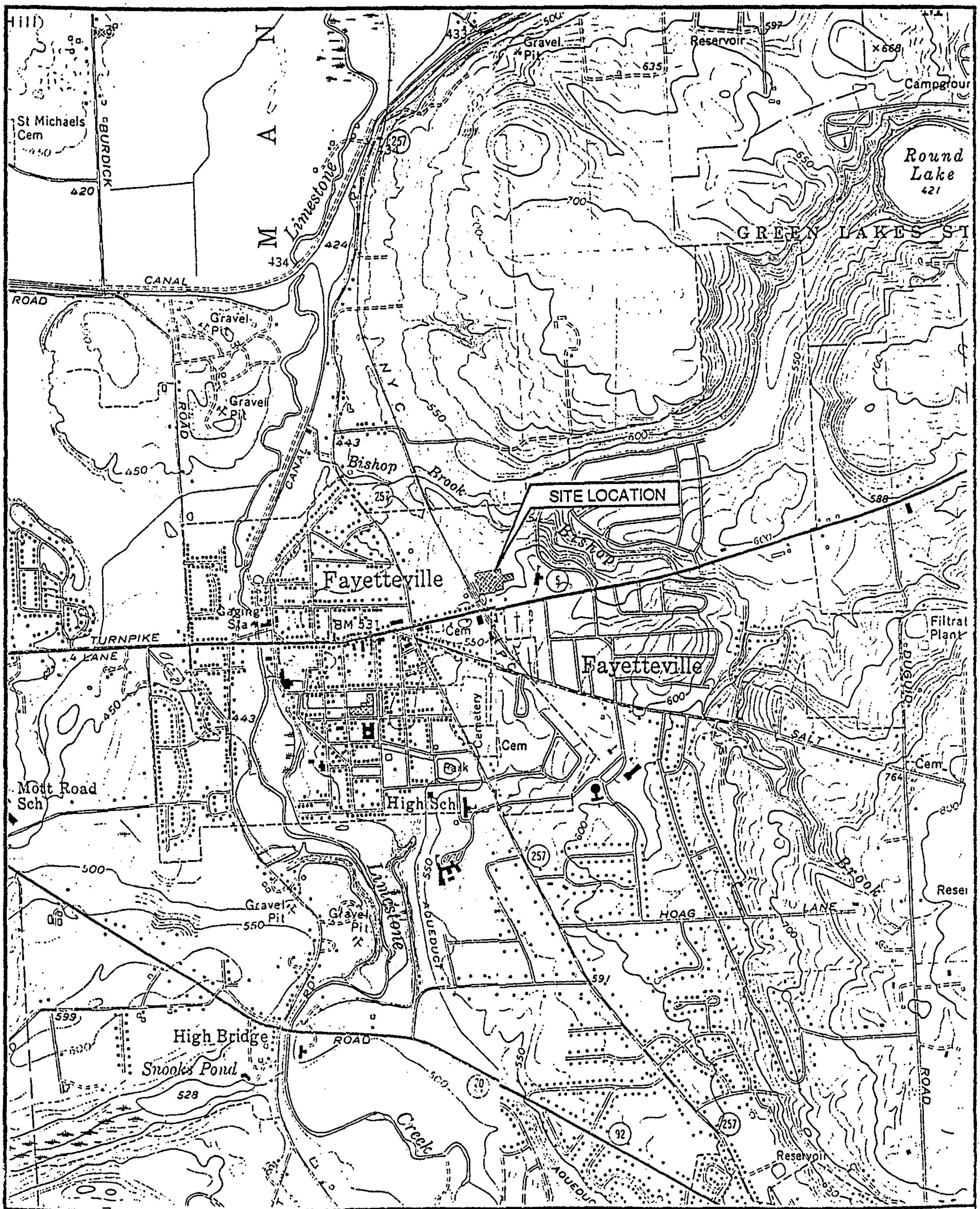
ITT Commercial Finance Corporation (ITT) is currently the mortgagee in foreclosure of the former Accurate Die Casting facility, located at 547 East Genesee Street, Fayetteville, New York (Figure 1-1). Field investigations performed to date have resulted in a general understanding of environmental conditions at the site. Following a review of work completed to date, the New York State Department of Environmental Conservation (NYSDEC) has determined that additional work constituting an administratively complete Remedial Investigation/Feasibility Study (RI/FS) must be performed at the site.

Currently, ITT has retained Stearns & Wheler to conduct the RI/FS at the former Accurate Die Casting site. This document represents a Draft Remedial Investigation Report for the Accurate Die Casting site. Additional work completed in 1992 and required by the NYSDEC as part of the Remedial Investigation (RI) is detailed in this report. The information obtained, combined with the results of previous investigations conducted at the site, is used to characterize the extent and environmental significance of contamination observed at the site. The Feasibility Study (FS) will assess in detail the information and data collected during the RI and will present recommended approaches to remediation and management of the identified environmental impacts.

1.2 OBJECTIVES OF THE RI

As stated in the RI/FS Work Plan (Stearns & Wheler), the RI has the following overall objectives based on general United States Environmental Protection Agency (USEPA) guidance and requirements and on NYSDEC's comments on the previously submitted report entitled "Phase II Environmental Assessment and Remediation Efforts":

- Further characterize the hydrogeology of the site, particularly any connection between unconsolidated overburden and bedrock groundwater quality.



Source:

USGS TOPOGRAPHIC
7.5 MINUTE QUAD
SYRACUSE EAST, N.Y.
QUADRANGLE
SCALE: 1"=2,000 Ft.

Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 1-1
SITE LOCATION

- Identify the location of groundwater discharge (and hence potential contaminant discharge) to surface water.

- Investigate the possibility of environmental impact due to constituents that may be present in channel sediments of Bishop Brook.

- Identify environmental resources at risk due to groundwater and surface water quality impacts from the site.

- Obtain additional water quality data to assist in development and evaluation of remedial action alternatives.

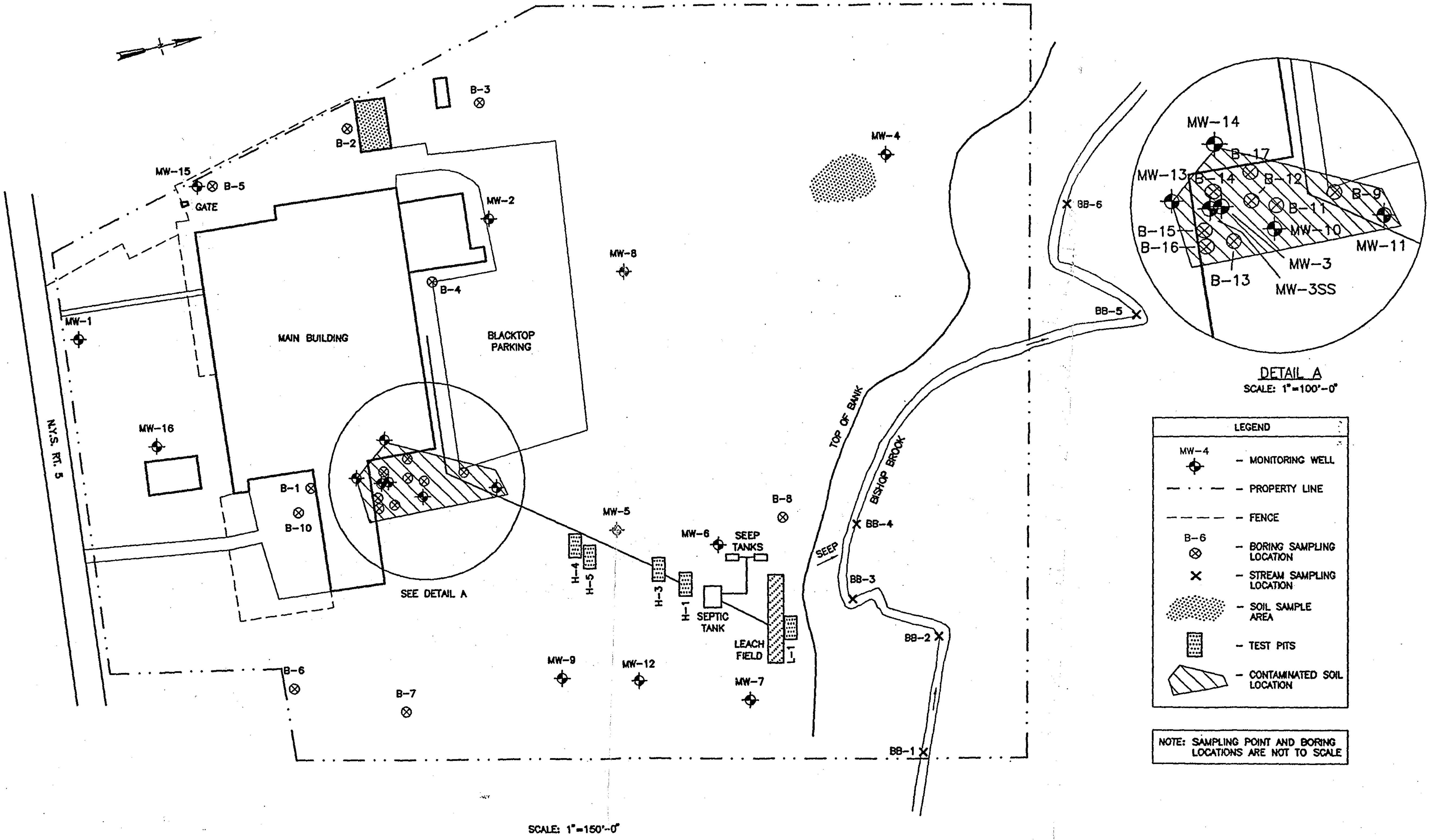
The ultimate goal of these activities is to provide sufficient additional information concerning volatile organic contamination of groundwater and surface water to allow completion of an administratively complete RI/FS for the site. Data obtained in the Remedial Investigation are used to develop and screen remedial alternatives for the site. Screening of remedial alternatives will be discussed in the Feasibility Study Report.

1.3 STUDY AREA BACKGROUND

The former Accurate Die Casting facility is located on a 32-acre parcel at 547 East Genesee Street in the Village of Fayetteville, New York (Figure 1-1). The facility was used as a die casting operation from its construction in the 1950s until its abandonment in 1988. The site includes parking areas adjacent to the main building, a wooded area to the north, scrub growth to the east, and a lawn to the south. The topography is generally flat on the south end of the site and slopes to the north on the north half of the site. At the northern edge of the property, there is a steep embankment adjacent to Bishop Brook, which flows from east to west (Figure 1-2).

Bordering properties include abandoned farmland to the north, residential areas on the western and eastern boundaries, and commercial properties to the south along East Genesee Street. An abandoned railroad siding extends along the western border of the property, acting as a buffer between the site and adjacent parcels.

With the bankruptcy of Accurate Die Casting, Inc., out client, as mortgage lender, commissioned Phase II environmental assessments for property transfer. Prior to proceeding with the detailed



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
FEASABILITY STUDY

FIGURE 1-2
SITE MAP

Phase II investigation, background information was reviewed to develop an understanding of the site conditions. This background included Phase I environmental assessments by Stearns & Wheler, HRP Associates, and Blasland and Bouck Engineers, P.C.; a sampling analysis report by HRP Associates; review of NYSDEC files relative to the site; and discussions with three former employees of Accurate Die Casting, Inc.

Previous assessments concluded that potential for environmental contamination existed at the site. The main causes for concern included waste oils on site, polychlorinated biphenyl (PCB) containing transformers, containerized wastes, a trichloroethylene (TCE) degreaser system, oil clogged floor drain system, underground petroleum storage tanks, and an abandoned septic system. Stearns & Wheler's Phase I assessment report is presented in Appendix B.

In June 1987, the NYSDEC responded to a release of waste oil at the facility. The release occurred in the northwest area of the site at the discharge of a cooling water outfall pipe. As a result of this release, the site was identified for future investigation by NYSDEC as a potential Class 2 Inactive Hazardous Waste Site. Allwash of Syracuse, Inc. was retained by the NYSDEC to contain and clean up the spill.

Based upon a review of work completed to date at the former Accurate Die Casting facility, the NYSDEC has required that additional work be performed at the site. Additional investigative activities were set forth in the Remedial Investigation/Feasibility Study Work Plan (Stearns & Wheler, May 1992). This report describes the results of that additional work in concert with a summary of previous investigative results from the site.

1.4 REPORT ORGANIZATION

This report contains a summary of pertinent information obtained at the site to date, integrated with detailed findings of most recent investigative tasks. The report contains the following elements:

A. **Chapter 2, Study Area Investigation.** Summarizes investigative activities completed at the site to date which are pertinent to completion of the RI/FS.

B. **Chapter 3, Physical Characterization of Study Area.** Describes the geology, hydrogeology, hydrology, and ecology of the site and its immediate vicinity.

C. **Chapter 4, Nature and Extent of Contamination.** Describes the type and distribution of volatile organic contamination observed at the site.

D. **Chapter 5, Contaminant Fate and Transport.** Discusses factors affecting the mobility and persistence of volatile organic contamination at the site.

E. **Chapter 6, Baseline Risk Assessment.** Characterizes potential risks to the health of humans and other receptors posed by observed on-site conditions.

F. **Chapter 7, Addendum to the Remedial Investigation.** Discussions conditions observed during installation and sampling of additional bedrock monitoring wells and findings related to additional soil sampling.

G. **Chapter 8, Summary and Conclusions.** Summarizes conditions observed on site and their contribution to potential risk, and suggests objectives for remedial actions.

CHAPTER 2

STUDY AREA INVESTIGATION

The primary goals of the RI at the former Accurate Die Casting site were to: (1) further characterize site hydrogeology; (2) obtain additional water quality data; and (3) identify environmental resources at risk due to groundwater or surface water quality impacts from the site. A large number of investigative tasks were completed at the site during the Phase II Environmental Assessment (Stearns & Wheler, 1990). These activities are briefly reviewed in Section 2.1. Additional tasks completed beginning in May 1992 are discussed in Section 2.2. The details of field procedures and quality assurance procedures used during all phases of work are provided in the RI/FS Work Plan (Stearns & Wheler, 1992).

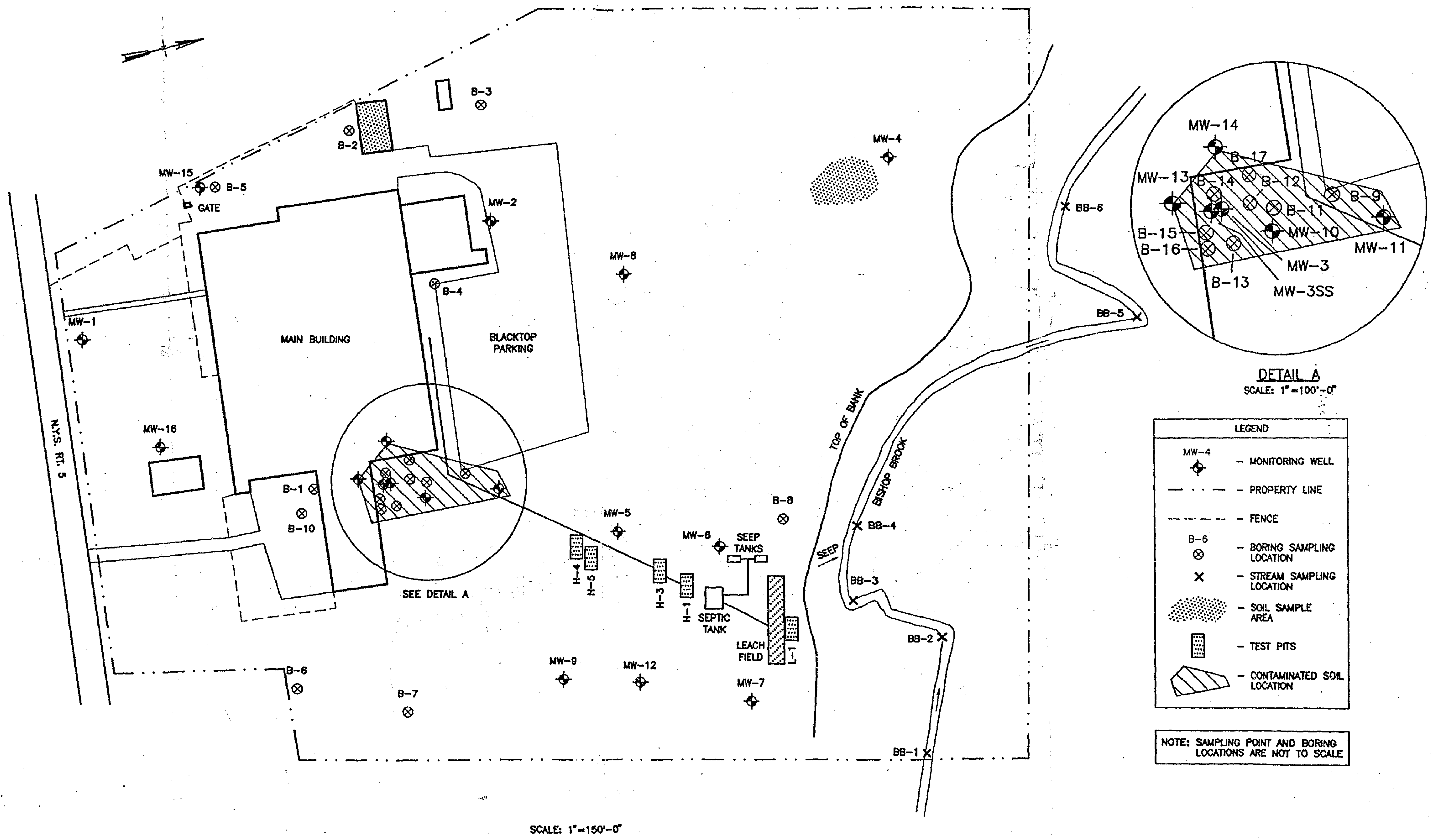
2.1 WORK COMPLETED THROUGH PHASE II INVESTIGATION

Only those aspects of previous work that are directly pertinent to the RI/FS are reviewed in this section. Other activities and details of methods and results are presented in the Phase II report (Stearns & Wheler, 1990). For the activities reviewed below, methodologies were essentially the same as those followed during subsequent work (Section 2.2).

A. **Monitoring Wells and Soil Borings.** Nine monitoring wells (MW-1 through MW-9) were completed at the site during the Phase II investigation, as shown in Figure 2-1. Due to the presence of free product trichloroethene (TCE) in Well MW-3, a free product recovery well was also installed (MW-3SS). Well MW-7 is screened in bedrock; all other wells are screened in unconsolidated overburden. Well logs and construction details are provided in Appendix A.

Seventeen soil borings were also completed during Phase II in order to assess bedrock depth and assist in delineating free product location. Boring locations are shown in Figure 2-1. Soil samples from both monitoring wells and soil borings were analyzed for volatile organics, PCBs, and EP toxicity levels of lead, zinc, and cadmium. In addition, three rounds of groundwater samples were obtained from monitoring wells during Phase II.

B. **Test Pits.** Five test pits were completed during Phase II and are shown on Figure 2-1. Pits H-1, H-3, H-4, and H-5 were located to assess possible movement of contaminants within the



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS
DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
FEASABILITY STUDY

FIGURE 2-1
PHASE II SAMPLING LOCATIONS

relatively permeable backfill material of the sewer line. Pit L-1 was located to assess the possibility of contaminant discharge from the sewer system. Soil samples from test pits were analyzed for volatile organic compounds.

C. **Soil Vapor Investigation.** A soil vapor survey was conducted during the Phase II investigation to measure TCE concentrations at property boundaries and establish baseline soil vapor TCE concentrations. Soil vapor probe locations are shown on Figure 2-2. Methodology is presented in the Phase II report; general results are presented later in this text.

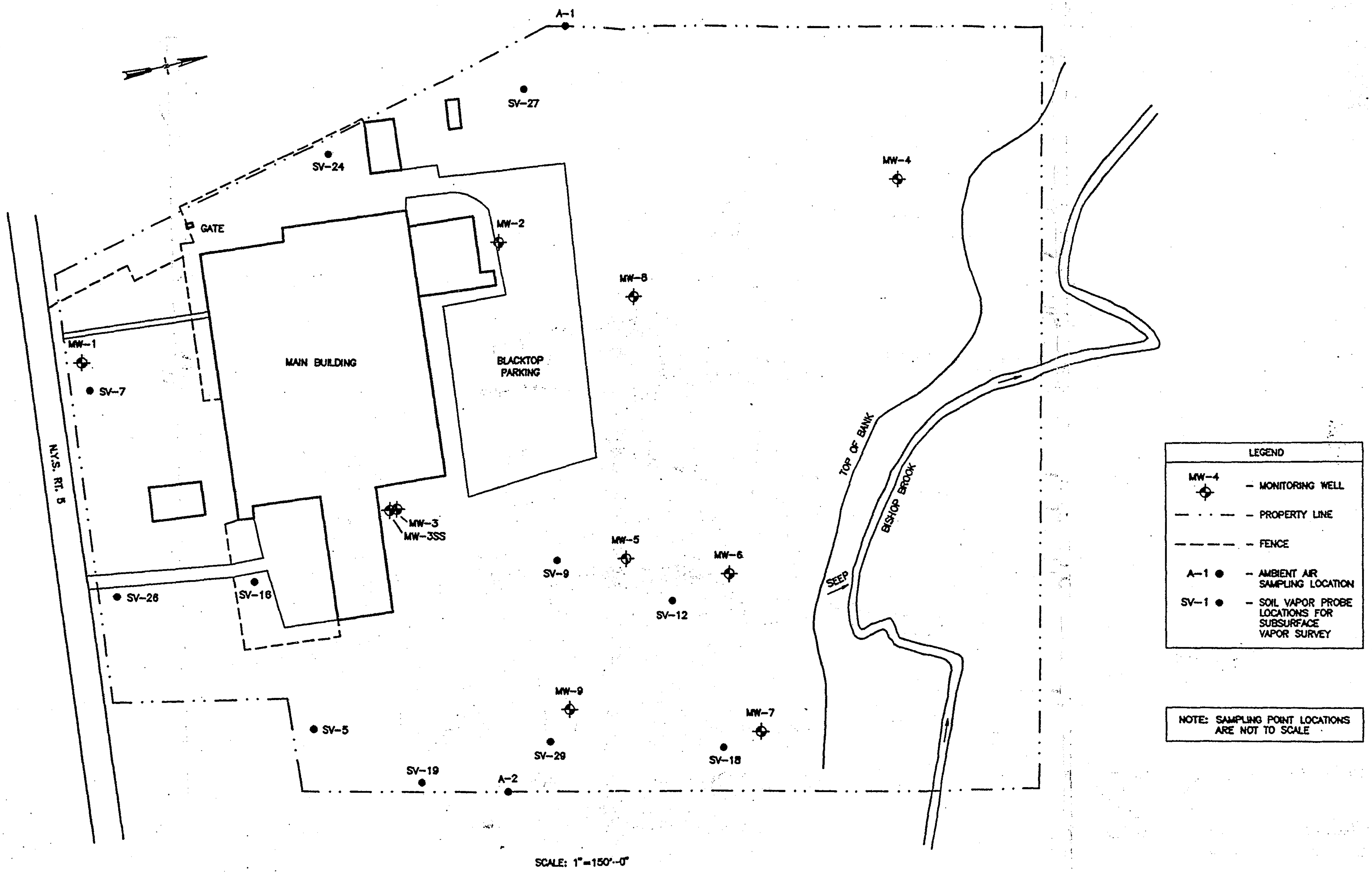
D. **Surface Water and Sediment Sampling.** Water and stream sediment samples were taken from three locations along Bishop Brook, as shown on Figure 2-1. Sampling points were at the upstream property boundary, mid-site, and at the downstream property boundary. Water samples were also taken from a groundwater seep on the bank of Bishop Brook north of Well MW-6.

E. **Preliminary Study Area Investigation Results.** The hydrogeology and chemistry of the study area, as understood at the conclusion of the Phase II investigation, is briefly described below. This information provided the basis for additional work performed at the site in 1992. A detailed description of our current understanding of site conditions is given in Chapter 3.

The Phase II investigation identified bedrock at the site as shale to shaly dolostone. Only one Phase II well (MW-7) was completed in bedrock. The bedrock surface slopes northward from the building toward outcrops in the Bishop Brook valley.

Bedrock at the site is overlain by Pleistocene glacial deposits of varying thickness and lithology. Sediments deposited directly by glacial ice are composed of silt, sand, clay and boulders. These dense "glacial till" deposits are overlain by a looser unconsolidated unit composed primarily of sand, silt, and gravel.

Depth to water data collected during the Phase II investigation indicated that groundwater flow in the overburden is generally north toward Bishop Brook. This was consistent with the existence of a groundwater seep at the Bishop Brook embankment. The dense, silty glacial till was hypothesized to constitute a lower confining layer for this northerly overburden flow regime. As previously stated, free product (liquid) TCE was observed in Well MW-3 during drilling. Soil samples from Well MW-3 showed TCE concentrations of 1.8 mg/kg in the 4- to 6-foot sample



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 2-2
PHASE II SOIL VAPOR SURVEY

interval, and 7500 mg/kg in the 19- to 21-foot sample interval. Soils collected from Borings B-11 through B-16 also showed evidence of TCE.

Groundwater sampling performed on three occasions in 1989 and 1990 indicated the presence of TCE in several overburden monitoring wells. Highest levels were observed in Wells MW-3 (where free product had been observed), MW-5, and MW-6. TCE was also detected in the groundwater seep near Bishop Brook. These results indicated that the principal migration of dissolved TCE is to the north. Some impact was also observed in Well MW-9; however, no TCE was observed in samples from Well MW-7. This supported the hypothesis that the glacial till acts as a lower confining unit for overburden groundwater flow. PCE was not detected in any of the groundwater samples analyzed during this phase.

Results of Phase II samples collected from Bishop Brook generally showed undetectable to low concentrations of TCE. Low levels of TCE were observed at mid-site and downstream locations; TCE was not detected upstream of the site. During all four Phase I stream sampling events, the concentration of TCE measured at the downstream property line was well below the New York State Department of Health (NYSDOH) standard for drinking water (5 ppb).

Based on these observations, interim remedial measures as well as additional investigative measures were undertaken.

F. **Voluntary Interim Remedial Measures.** A number of interim remedial measures (IRMs) were initiated during the Phase II investigation, as detailed in the Phase II report. The majority of these measured involved removal of potentially hazardous materials, such as containerized wastes, in and around the plant building, and thus are not directly related to this RI/FS. However, removal of free product TCE near Well MW-3SS (Figure 2-1) would be expected to directly affect subsurface TCE concentrations. Free product removal would be expected to ultimately lower dissolved TCE concentrations and could cause changes in observed TCE concentrations over the course of investigations at the Accurate site. For this reason, free product removal is described below.

Four-inch diameter recovery Well MW-3SS was installed adjacent to Well MW-3. MW-3SS was developed using a vacuum-type transfer pump to remove silt and induce recharge to the well. Approximately 280 gallons of TCE free product were removed during development. All liquid removed from the well was drummed and disposed of as hazardous waste.

Following well development, a small-diameter, dual phase pump was installed to recover free product (settings were chosen to limit pumpage of groundwater). All free product collected was pumped to a 1,000-gallon storage tank with appropriate shutoff and secondary containment features to minimize potential hazards. This task was emptied by a waste disposal contractor at less than 90-day intervals, and waste was disposed of in accordance with all applicable regulations.

Initial free product recovery was approximately 5 gallons per day. Recovery rate slowed as free product was removed. Approximately 550 gallons of free phase product were recovered and the product thickness went from 20 inches to 2 inches. Recovery dropped to approximately 0.5 gallons per day. At that point, it was determined that product recovery was no longer effective, and the pump was turned off with the understanding that more comprehensive remediation might be implemented in the future.

In April of 1990, routine inspection of the facilities revealed a small (1 inch in diameter) stain near an interior transformer and a loss of fluid in the exterior transformers. Syracuse Merit Electric, Inc. inspected each of the transformers on site and detected signs of leakage in three of these units. PCBs were also detected on floor surfaces beneath interior transformers above the USEPA recommended cleanup level. A soil sample taken near the exterior transformers did not detect any PCBs.

Two of the three interior transformers (one 750 KVA and one 1,000 KVA) contained dielectric fluid with PCBs. These two transformers were taken out of service, drained of the dielectric fluid, and disposed of. All four exterior transformers had the dielectric fluid drained, were dismantled, and then relocated to the interior of the building. All associated capacitors and switchgear containing PCB fluid were also disposed of properly.

PCBs were not detected in any other areas that were characterized. Therefore, with the completion of this voluntary action, the potential for further releases of PCBs had been eliminated.

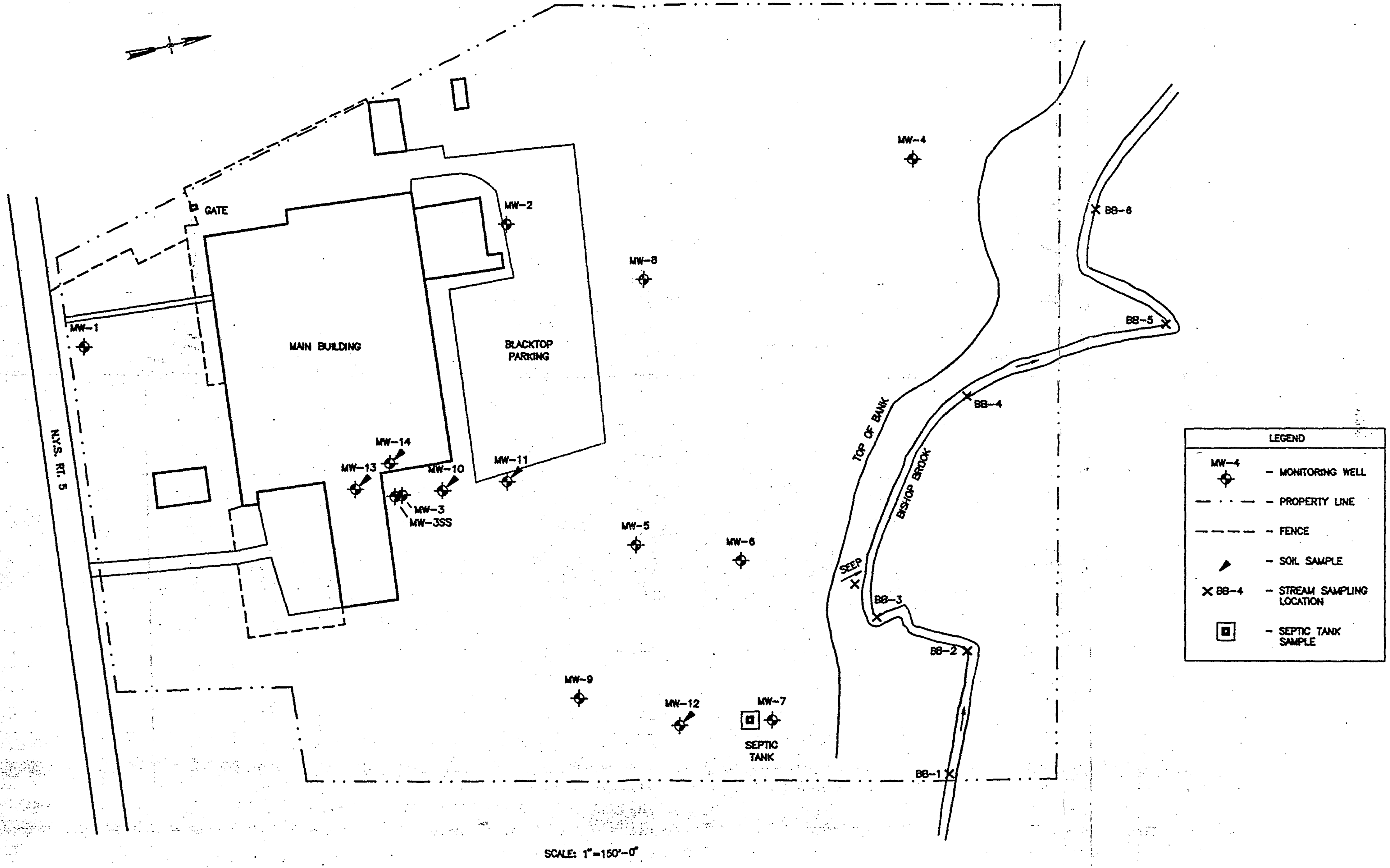
2.2 ADDITIONAL WORK CONDUCTED MAY-OCTOBER 1992

A review of work completed to date has provided sufficient information to develop a general understanding of site conditions. Using this knowledge, a strategy was developed for further site characterization, risk and environmental assessment, and management planning. Additional information was required to further characterize the full extent of shallow aquifer contamination, and potential bedrock aquifer or surface water contamination, thus allowing risk assessment and remedial alternatives screening to be conducted. The tasks described below were designed to accomplish these goals and allow completion of the RI/FS. Specific details of the procedures were presented in the FSP and QAPP (Stearns & Wheler, 1992). Daily field logs for all field tasks are provided in Appendix B.

All analytical services for this investigation were provided by Nytest Environmental, Inc. (NEI). Data validation services were provided by Roy F. Weston, Inc., Analytics Division, of Lionville, Pennsylvania. Both of these subcontractors are Contract Laboratory Program (CLP) and New York State Analytical Services Protocol (ASP) facilities.

A. **Monitoring Wells.** Installation of five monitoring wells was completed between May 6 and May 16, 1992. Previous investigations (Section 2.1) included the installation of one bedrock monitoring well at the site, MW-7. Groundwater samples taken from this well showed no evidence of volatile organic contamination. In order to further our understanding of bedrock aquifer groundwater quality in the vicinity of MW-3, two additional bedrock monitoring wells were installed. Wells MW-10 and MW-11 are shown on Figure 2-3; both wells are screened in bedrock Well MW-10 is completed to a depth of 54 feet, Well MW-11 to a depth of 48 feet. Well logs are provided in Appendix A.

In order to investigate possible groundwater contamination in overburden in the northeast corner of the site, an additional overburden monitoring well, MW-12, was installed between MW-7 and MW-9 (Figure 2-3). The initial recommendation by NYSDEC was to place this well adjacent to the current MW-7 location. A review of the MW-7 boring log indicates that depth to bedrock is approximately 25.5 feet, and that there is at least 1.5 feet of coarse, cobbly material overlying bedrock. Depth to water in the overburden aquifer at MW-7 is roughly 22.5 feet. We believed that it would be inadvisable to screen the proposed overburden well in the cobble layer directly overlying bedrock, due to the possibility of introducing contaminants to the bedrock aquifer. This means that the maximum thickness of saturated overburden available for a monitoring well in this area would be 1.5 feet. A well installed at this location would likely contain insufficient water to allow sampling and would be of limited usefulness in long-term monitoring due to periodic low water table elevations. Moreover, it is difficult to purge a well with very little water in it (1.5 feet or less) without jeopardizing the accuracy of VOC results. Purging lowers the water table and induces turbulence, which volatilizes organics. In a well with little water, a high percentage of the flow entering the casing following purging is exposed to turbulence; therefore, inaccurate organics



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 2–3
SAMPLING LOCATIONS

concentrations would result. For these reasons, Well MW-12 was installed to the north of MW-7, where water table elevation is slightly higher and bedrock is at a slightly greater depth than at MW-7 (based on observed conditions at MW-9). Well MW-12 was completed to a depth of 46 feet and screened in overburden.

Finally, to assess whether soils and groundwater under the building and in the vicinity of MW-3 are significantly impacted by TCE, two wells were installed within the building. Well MW-13 is located in the east addition just south of MW-3. Well MW-14 is located in the main building just west of MW-3 (Figure 2-3).

Both wells were completed so that the base of the screen was as near as feasible to the low permeability layer that appears to act as a confining unit at the base of the overburden aquifer. Well MW-13 was completed to a depth of 21 feet; MW-14 was completed to a depth of 24 feet. Both wells were virtually dry at the time of drilling, but were completed in the lowest permeable interval, with the expectation that there would be water in the wells during wetter seasons.

All monitoring wells were installed by Northstar Drilling Company (Cortland, New York) and installation was observed and evaluated by Stearns & Wheler geologists. Lithologic logs for all wells with well construction details are provided in Appendix A.

The drill rig, augers, other drilling tools, and soil sampling equipment were steam cleaned between each drilling location to minimize the possibility of cross contamination between holes. Split-spoon samples were taken at 5-foot intervals, at a minimum. In borings where precise definition of stratigraphy was desired, samples were collected continuously. Split spoons were decontaminated between samples. Samples were examined and described by a Stearns & Wheler geologist. All samples were screened with a photoionization detector (PID) to estimate the level of volatile organic compounds present. Results are presented on well logs (Appendix A). In addition, a total of seven soil samples were taken from the five monitoring wells for laboratory analysis. Sample selection was based on PID readings of split-spoon samples. Samples were analyzed for target compound list (TCL) volatile organics and TCL metals. Laboratory results are discussed in Chapter 4.

All wells were constructed with 2-inch I.D.stainless steel riser and 10-slot (0.01-inch) stainless steel screen. Wells were sand packed from the base of the screened interval to 2 to 2.5 feet above the screened interval. All construction materials were emplaced into the annulus using a tremie pipe to reduce bridging. A 2- to 3-foot thick bentonite seal was emplaced above the sand pack, and the well was finished with cement-bentonite grout with a cement pad at the surface. A locking steel well cover was installed in the cement surface seal.

In order to minimize the chance of transferring contamination from overburden to bedrock, bedrock Wells MW-10 and MW-11 were installed in three stages. First, wells were advanced to the interface between the loose, overlying silts and sands and the denser glacial till. A 5-inch I.D. steel casing was installed, grouted to the surface, and allowed to set until the grout hardened. Drilling was then continued through this surface seal to the top of competent bedrock. A 4-inch I.D. steel casing was then installed, grouted to the surface, and the grout allowed to harden. Drilling continued through the center of the 4-inch casing and the well was installed as previously described. A rock core was collected from MW-11 to characterize the bedrock.

All new wells were surveyed onto the existing base map for the site, and well elevations were determined. On May 16, 1992, all new wells were developed by Northstar Drilling Company. Wells were pumped until turbidity decreased to provide essentially clear water or until turbidity failed to decrease with continued development.

Following well development, hydraulic conductivity tests (slug tests) were performed in those new wells which contained sufficient water to permit this procedure. A pressure transducer was placed in the well and attached to a Hermit 1000C Datalogger (In-situ, Inc., Laramie, Wyoming). Water was then displaced by rapidly lowering a decontaminated aluminum bar into the well. Water levels were monitored throughout recovery to static water level. Water level recovery data were analyzed by the Bouwer-Rice method to obtain an estimated hydraulic conductivity. Slug test calculations are provided in Appendix C.

B. **Groundwater Sampling.** On June 2-4, 1992, one round of water quality samples was taken from eight of the previously existing wells and three of the new wells. Wells MW-1, MW-13, and MW-14 did not contain sufficient water to allow sampling. This sampling round was intended to allow further characterization of shallow and bedrock water quality at the site, including any changes that may have occurred since the removal of TCE free product from the subsurface.

Before sampling, each well was purged of three well volumes of water. Disposable bailers and rope were used for purging each well. Samples for laboratory analysis of TCL volatile organics and TAL metals were then obtained. Again, disposable bailers and rope were used, and all equipment which came into contact with groundwater was decontaminated between wells. Samples were kept under observation or sealed at all times and were shipped overnight to the laboratory at the end of each sampling day. Details of sampling methodology are presented in the QAPP and FSP (Remedial Investigation/Feasibility Study Work Plan, Stearns & Wheler, 1992). Chain-of-custody documentation is provided in Appendix D.

On August 7, field parameters were measured in the monitoring wells. This was completed because a review of the results from the June 2 event indicated that the field instrument measuring pH, conductivity, and Eh had been malfunctioning. Field parameters are presented on Table 2-1. While collecting field parameters and water levels on August 7, it was observed that there was sufficient water in Wells MW-1, MW-13, and MW-14 to collect samples, at least for analysis of volatile organics. On August 19, the three wells were sampled.

It should be noted that although NYSDEC states that groundwater samples having a turbidity above 50 NTU are not recommended for analytical purposes, samples with turbidities above this standard were collected and analyzed. Following are the reasons for this evaluation:

1. Because of the fine-grained nature of the sediments in the area, lower turbidities are difficult to achieve despite proper development and careful sampling techniques.

2. Because the contaminants of concern at the site are volatile organic compounds, turbidity is not the significant concern that it would be if metals were the contaminant of concern.

3. Turbidity would not necessarily impact the analytical results of the VOC analysis.

4. Were the samples with turbidities over 50 NTUs not evaluated, this would have limited our data set to the point of not being useful to draw any reasonable conclusions.

Because of these reasons, we proceeded with the analysis of all groundwater samples.

C. **Surface Water and Stream Sediment Sampling.** Previous investigations have identified low concentrations of TCE in water samples from Bishop Brook. Although observed surface water TCE concentrations were below NYSDEC guidance values for Class B and Class C surface water, contaminated stream bed sediments could contribute higher levels to the stream

TABLE 2-1: FIELD PARAMETERS

LOCATION	DTW	pH	Eh	COND.	TEMP. (C)	TURB.
MW-1	24.42	7.11	0.42	130	14.3	870
MW-2	10.36	6.96	-113	0.29	15.5	27
MW-3	18	10.03	36	0.31	14.9	492
MW-4	17.71	6.98	108	0.3	13.5	61
MW-5	29.2	7.14	132	0.49	12.4	112
MW-6	18.92	7.13	121	0.47	13	41
MW-7	23.87	7.13	38	1.99	12.8	5
MW-8	24.95	7.12	125	0.64	12.4	148
MW-9	42.2	7.52	112	0.45	14.5	548
MW-10	38	7.38	130	0.35	13.7	98
MW-11	30.14	7.34	119	0.57	14.2	2
MW-12	31.37	7.61	103	0.5	12.8	230
MW-13	20	7.42	106	0.19	12	112
MW-14	19.08	7.36	106	52	11.7	7

during stream bed disturbances. In addition, contaminated sediments could provide a long-term source of contamination to the stream even after the primary source near the facility is remediated.

Based on previous studies, it is our belief that the most significant source of contamination to the stream is the groundwater seep observed at the Bishop Brook embankment. To evaluate the degree to which stream bed sediments are contaminated and help identify where contamination is entering the stream, six locations were chosen for stream water and sediment sampling. As shown on Figure 2-3, three sampling points are upgradient from the seep, including an upgradient boundary sample. Three sampling points are downstream of the seep to assess possible contamination sources along that stretch of stream, and one sample of the seep water was collected. Sampling occurred from May 29, 1992 through June 4, 1992. Sediment samples were collected at depths of 0, 6, and 12 inches, or as sediment depth permitted. Surface water samples were taken in Bishop Brook adjacent to sediment sample locations. All equipment used for sampling was disposable or was decontaminated between sampling points. Sampling methodology is detailed in the QAPP and FSP (Remedial Investigation/Feasibility Study Work Plan, Stearns & Wheler 1992). Samples were maintained under chain-of-custody and were shipped to the laboratory by overnight mail each day. Chain-of-custody documentation is presented in Appendix D.

During a previous study phase, the seep was sampled at two points: just above the seep but below the ground surface, and at the free-flowing surface of the seep. The subsurface sample had 700 ppb TCE, and the surface sample had 78 and 74 ppb TCE (measured on two separate occasions). The difference between the subsurface and surface values is attributed to volatilization of the TCE. The significant change in concentration in the course of the seep and the minimal (below standards) impact to the stream suggest that, just through natural volatilization, the seep is not a significant concern.

D. **Septic Tank Sampling.** To investigate the possibility that the septic tank (Figure 2-3) is a source of groundwater contamination, the septic tank was sampled on May 28, 1992. Upon excavation and opening of the tank, it was observed that the tank had been decommissioned by being filled with gravel through three manways. The gravel did not fill the tank completely and between the manways, near the top of the tank, a white material with a soil-like consistency was found. This material was sampled. The sample was kept under chain-of-custody and transported via overnight mail to the laboratory. The sample was analyzed for TCL metals and TCL volatiles.

E. **Water Level Determination.** Water levels were periodically taken in all monitoring wells on site. Depth to water was measured with a conductance probe and was converted to water table elevation by subtracting from surveyed measuring point elevation for each well.

F. **Habitat Survey.** A qualitative habitat survey of the areas adjacent to Bishop Brook downstream to its confluence with Limestone Creek was performed to determine what potential receptors are present. The purpose of the survey was to identify the various habitats, including their flora and fauna, in the vicinity of the site and along Bishop Brook to determine sensitivity to potential impacts.

CHAPTER 3

PHYSICAL CHARACTERIZATION OF STUDY AREA

3.1 LAND USE

The Accurate Die Casting facility is located in the Village of Fayetteville in the Town of Manlius, a suburb of the City of Syracuse. Fayetteville has a population of approximately 4,300 people and includes a mix of residential, commercial, and undeveloped land.

The facility is located on Route 5, a significant east-west route through the state prior to construction of the New York State Thruway. As such, there is notable commercial development along the road. On Route 5 in the immediate vicinity of the site are a lumber yard, a car dealer, a service station, a shopping center, and a professional office. A post office, church, and day care center are also in the vicinity. To the east and northeast of the site is a residential area. North and northwest of the site are undeveloped wooded areas.

3.2 GEOMORPHOLOGY AND HYDROLOGY

The Accurate Die Casting site lies within the Ontario Lowland Physiographic Province, just north of the Appalachian Upland border scarp zone (Winkley, 1989). The Ontario Lowland in this area consists of a relatively low relief lake plain blanketed by glacially derived sediments.

Land surface at the Accurate site slopes generally northward. Slopes are shallow in the southern portion of the site near the building, and increase northward to a relatively steep embankment at Bishop Brook (Figure 1-1).

Surface waters in the area are within the Oneida River Basin, and are ultimately tributary to the Lake Ontario drainage system. All surface water at the site drains into Bishop Brook, which flows from east to west across the northern boundary of the site (Figure 1-1). Bishop Brook empties into Limestone Creek several miles west of the site (Figure 1-1). Limestone Creek flows into Chittenango Creek, which in turn flows into Oneida Lake.

3.3 GEOLOGY

A. **Regional Geology.** Bedrock in the vicinity of the site consists of dolostone, evaporites, and shale of the Upper Silurian Camillus and Bertie Formations and Cobleskill Limestone (RIckard and Fisher, 1970). These rocks were deposited in relatively stable, shallow, continental marine environments. Despite significant orogenic activity to the east during the Devonian Acadian orogeny, bedrock in the Syracuse area underwent little structural deformation (Winkley, 1989). As a result, bedrock in the area exhibits only a slight dip (inclination of bedding planes) of about one degree toward the south-southwest.

Silurian bedrock in the vicinity of the site is immediately overlain by unconsolidated Pleistocene glacial deposits of varying thickness and lithology. Sediments deposited directly by glacial ice are generally composed of mixed sand, silt, clay, gravel, and boulders. They are commonly dense and relatively impermeable to groundwater flow and are termed "glacial till". Glacial till units in the area are commonly overlain and/or cut by sand, silt, or gravel outwash or glaciolacustrine units. Outwash units may be of various origins (meltwater channels, deltas, beach terraces, etc.), but are commonly composed at least partly of sand and are relatively permeable to groundwater flow.

B. **Site Geology.** Fourteen groundwater monitoring wells and numerous borings and test pits completed at the site have provided information about the surficial and bedrock geology of the site. Monitoring well logs from all wells are provided in Appendix A. Boring and test pit logs are provided in the Phase II investigation report (Volume III). The following is a summary of geological conditions observed at the site.

Bedrock observed in several monitoring wells and borings, as well as outcrops adjacent to Bishop Brook, ranged from gray-green shale to shaly dolostone. Cores from MW-11 indicate that the bedrock is highly fractured. The bedrock surface slopes to the north at the site, gradually on the south side of the site, and more steeply on the north side of the site, down into the Bishop Brook ravine. Based on a 100-foot arbitrary elevation datum on the site (manhole rim in parking lot), bedrock elevation in MW-1 at the south edge of the site is 75 feet, and at MW-6 in the north end of the site, bedrock elevation is 29 feet. This represents a drop of 46 feet. Bedrock elevation continues to drop off as it approaches Bishop Brook. At the west end of the site, bedrock outcrops can be seen in the south wall of the ravine.

Three cross sections were derived from the monitoring well logs from all phases of drilling. The locations of the cross sections are shown on Figure 3-1. Figure 3-2 is a southern west-to-east cross section, Figure 3-3 is a northern west-to-east cross section, and Figure 3-4 is a north-to-south cross section. Figure 3-4 illustrates the topography of the bedrock at the site.

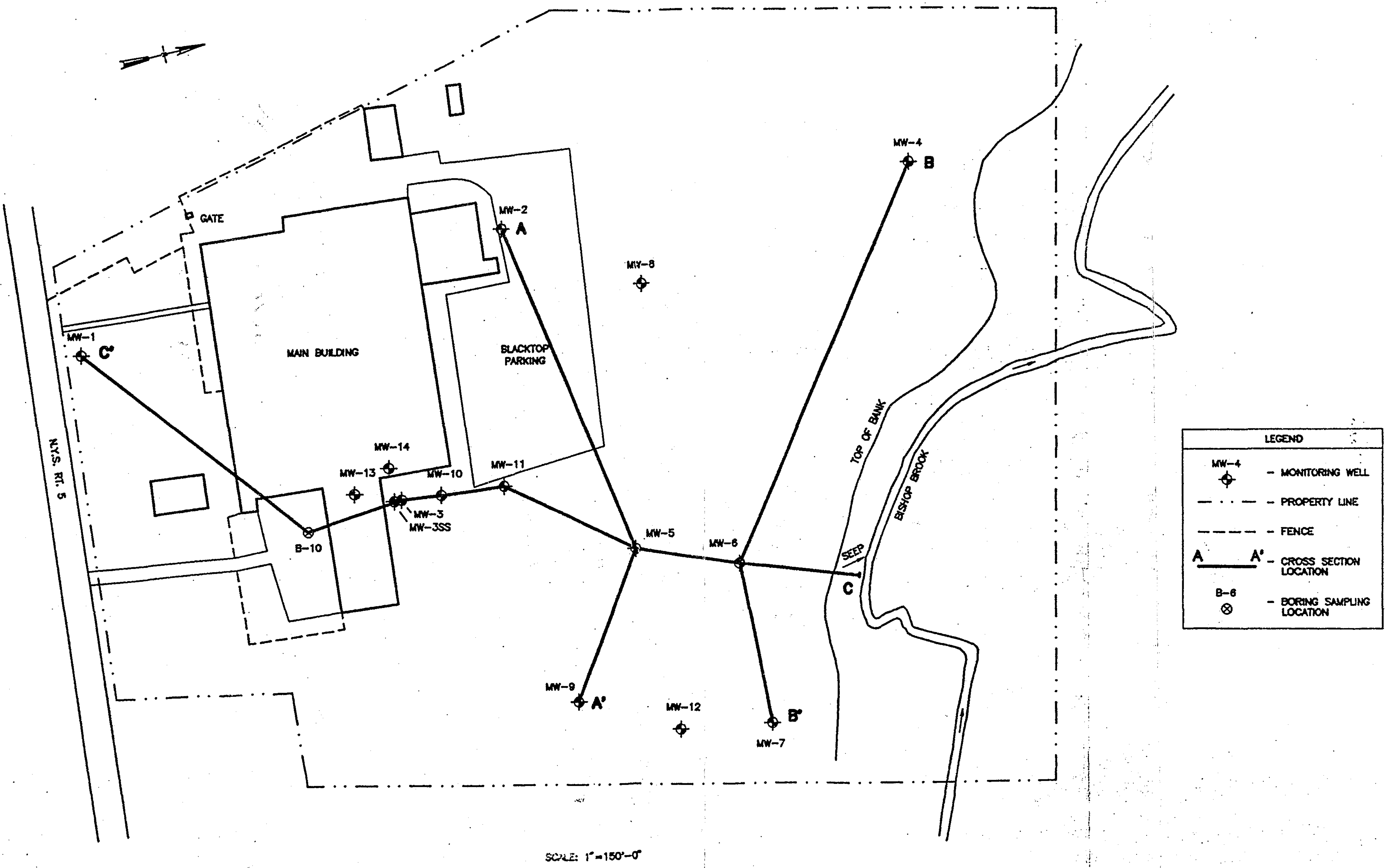
The overburden stratigraphy is quite variable and complex for the relatively small site. Overlying the bedrock is a dense layer that ranges in composition from red clay to silt with sand, gravel and cobbles. This layer has been interpreted to be glacial till and ranges in thickness from 0 to over 30 feet, pinching out to the south and getting thicker to the north. The till is overlain by coarser sand and gravel deposits attributed to fluvial deposition. Coarser sand and gravel generally underlies a finer-grained silt, sand and gravel zone, but the two different zones tend to interfinger as shown in all three cross sections.

With the additional information gained in the most recent phase of drilling, the interpretation of the subsurface has been modified. The boring log from MW-12 indicates bedrock at a depth of 44 feet. This suggests that the earlier interpretation of a buried valley running north to south in a line roughly connecting Wells MW-3, MW-5, and MW-6 is not necessarily valid. Although the seep, topographic expression, and groundwater chemistry suggest a preferred flow path, it is not necessarily attributable to a bedrock valley. Although the overburden materials are variable, there is no definitive evidence of a channel-like deposit running to the north through the site.

In summary, the overburden stratigraphy consists of fluvial deposits overlying glacial till. The fluvial deposits have two different characters, but this does not appear to have a significant impact on the assessment of the site conditions. Although the till layer did have the apparent capability of reducing the downard flow of free product, as evidenced by the pool of free product encountered at Well MW-3, it is apparent, based on the results of Wells 10 and 11, that dissolved phase TCE has reached the bedrock aquifer. The topography of that till layer could have impacted the direction of free product migration, but numerous borings and wells have indicated that the free product has been confined to the immediate vicinity of MW-3.

3.4 HYDROGEOLOGY

A. **Major Water-bearing Units.** Two major water-bearing units exist at the site. These include the unconsolidated overburden and the fractured bedrock. Although the overburden has three components -- till, fine fluvial, and coarse fluvial -- it will be discussed as one unit, that being

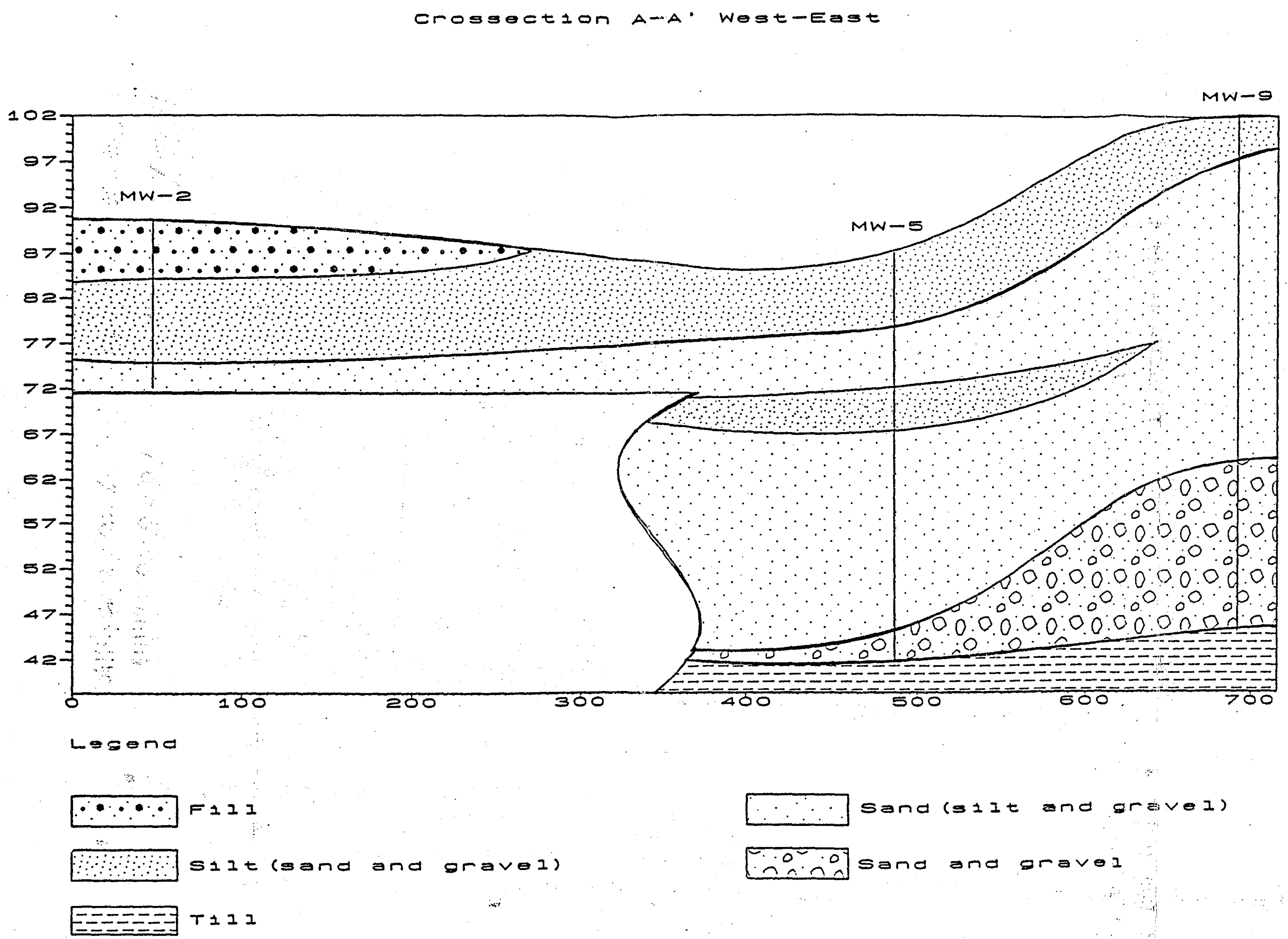


Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 3-1
GEOLOGIC CROSS SECTIONS

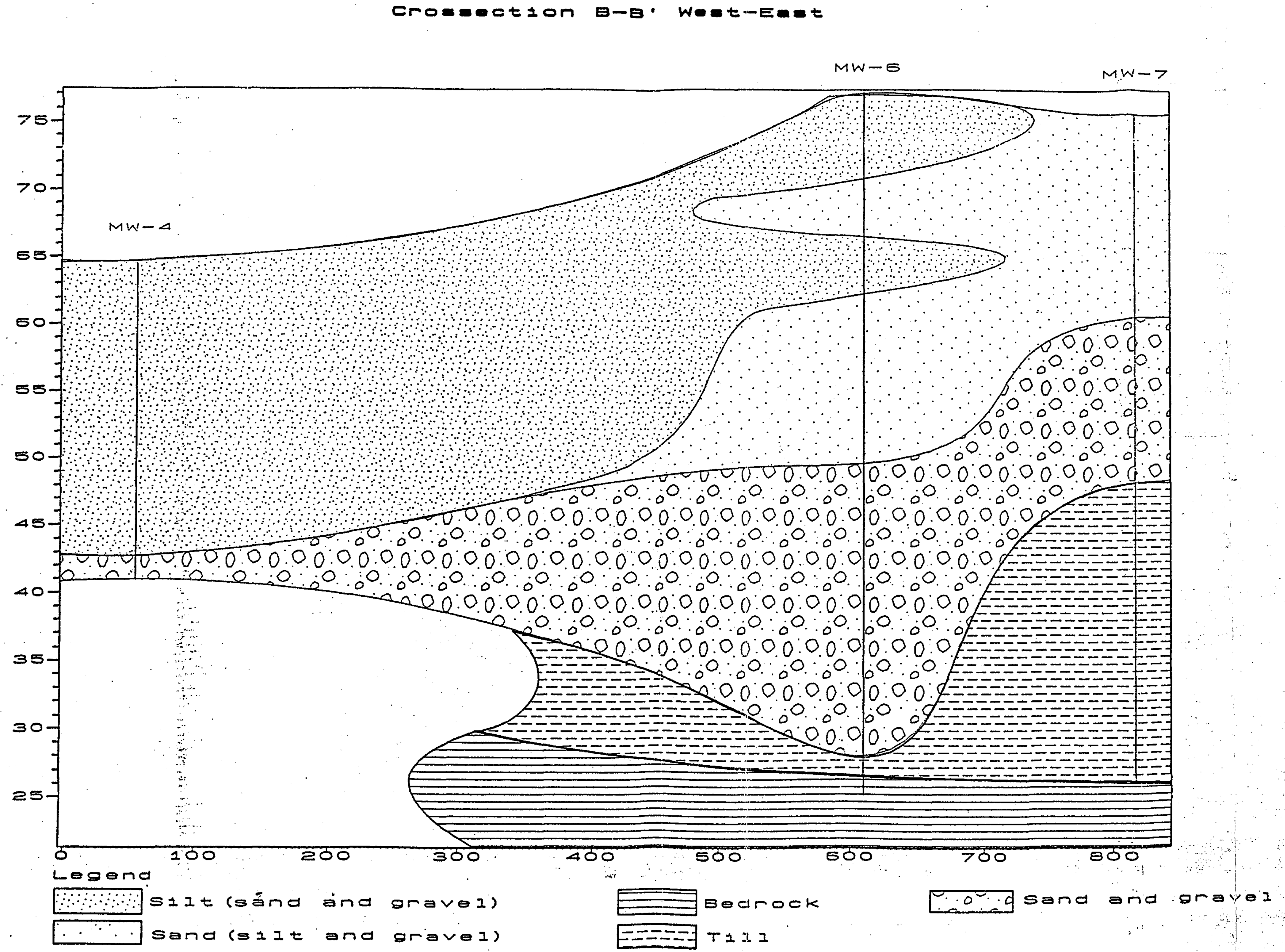


Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 3-2
GEOLOGIC CROSS SECTION A-A'

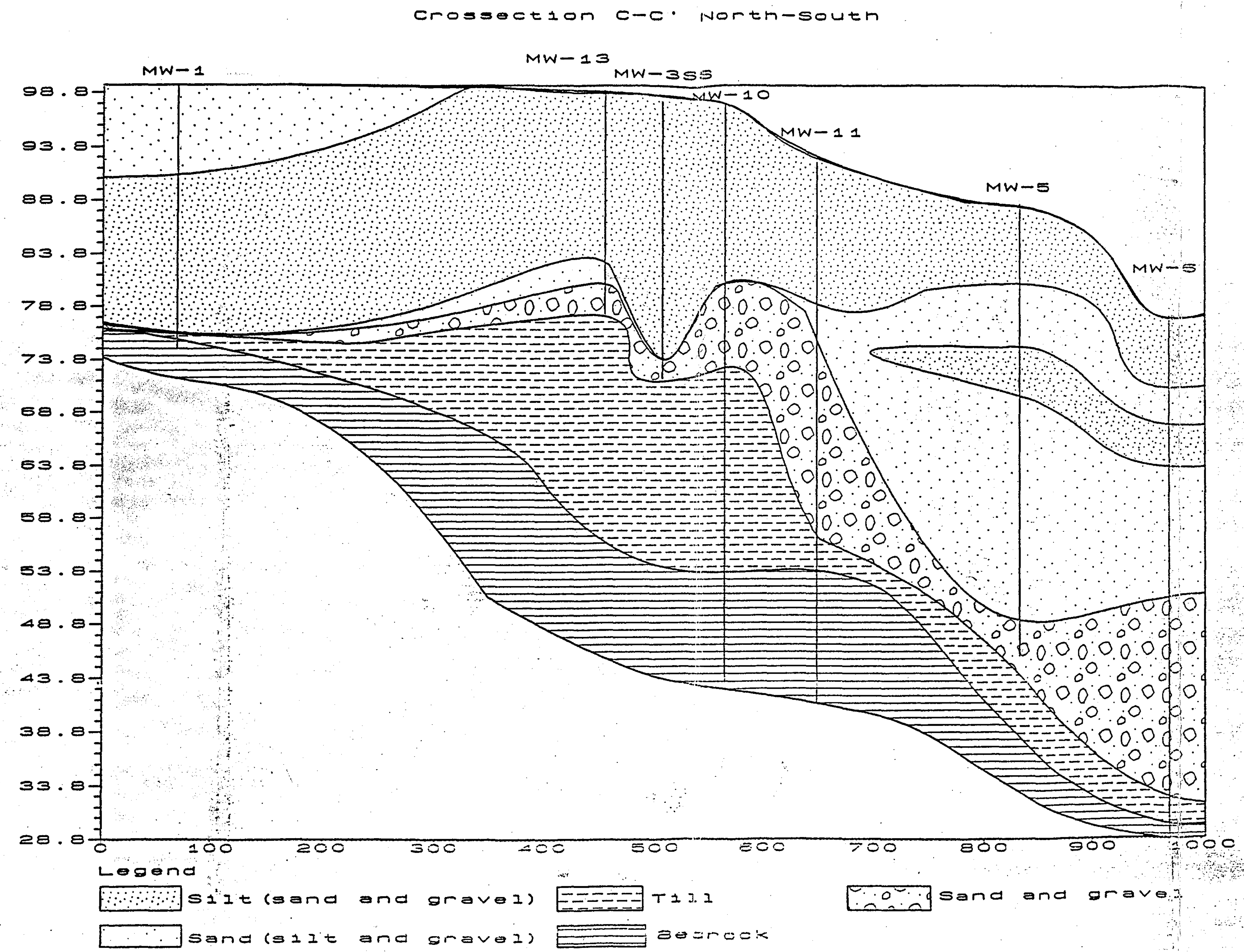


Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 3-3
GEOLOGIC CROSS SECTION B-B'



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 3–4
GEOLOGIC CROSS SECTION C–C'

comprised of the fluvial deposits. The till, although saturated, will not be considered a water-bearing unit because of the relative immobility of the water.

B. **Groundwater Flow.** Water level data in wells were collected several times during the Phase I I investigation and groundwater contour maps based on that data are included in the Phase II report. Water levels were collected from all on-site wells three times during the course of this investigation. Water level data are summarized on Table 3-1. Water table elevations were calculated with respect to an arbitrary datum of 100 feet at the ground surface of the site and are also shown on Table 3-1. The calculated water table elevations were used to contour water table maps for the three dates data were recorded. Figures 3-5A to 3-5C illustrate a representative interpretation of the water tables and groundwater flow on those dates. As expected and indicated on the Phase II maps, flow is generally from the south to the north, towards Bishop Brook. Also, as indicated previously, when there is a measurable water level in MW-1, a southerly component of flow away from the building is suggested. The southerly component of flow in this area is the result of a groundwater divide which becomes measurable during periods of high infiltration. This idea is supported by the fact that the site lies on a topographic divide between Bishop Brook to the north and Limestone Creek to the southwest. MW-13 and MW-14 were dry at the time they were drilled, but during subsequent monitoring, had small amounts of water in them. Water elevations in the interior wells are generally consistent with MW-3. The fact that they have less water in them is a function of the elevation of the lower till layer.

In-situ hydraulic conductivity (slug) tests were performed in Wells MW-1, MW-2, and MW-4 through MW-9 during the Phase II study. In this investigation, slug tests were performed in Wells MW-10, MW-11, and MW-12. Results from MW-10 did not provide a smooth curve that could be interpreted. MW-11 and MW-12 results are presented in Table 3-2, which also summarizes the results of Phase II testing. Slug test calculations are included in Appendix F.

Eliminating the results of tests in MW-1 and MW-12, which were obvious outliers not representative of the site as a whole, and MW-7 and MW-11 which are completed in bedrock, the median hydraulic conductivity across the site is 1.31 x 10^{-3} cm/sec. Selecting a median value has been determined to be reasonable because the wells are all completed in the more permeable sand unit where most of the significant groundwater flow is occurring.

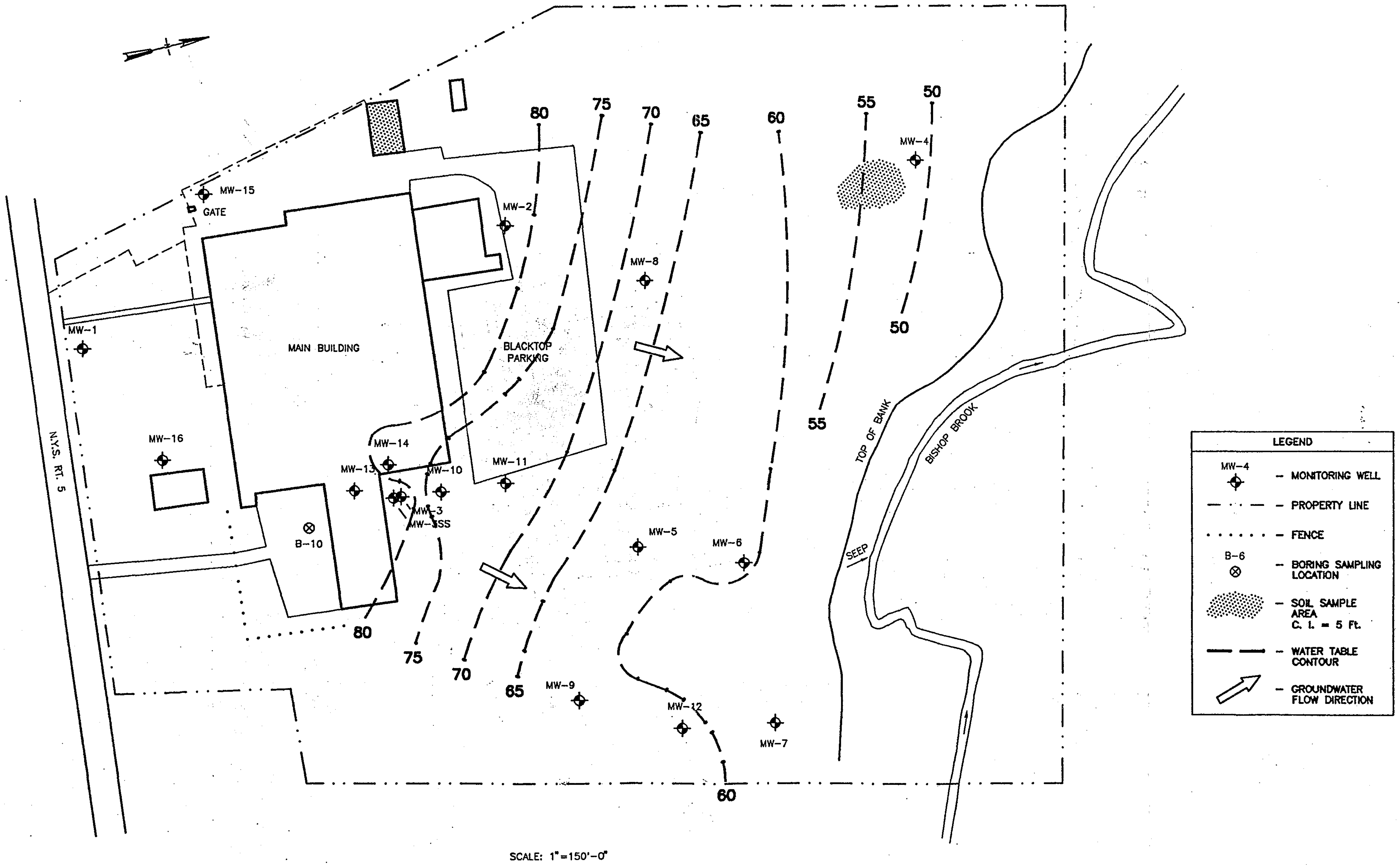
The shallow groundwater flow rate across the site has been estimated from the median hydraulic conductivity value of 1.31 x 10^{-3} cm/sec and gradient. Between the building and the Bishop

TABLE 3-1: DEPTH TO GROUNDWATER AND WATERTABLE ELEVATIONS

		5/28/92		6/26/92		8/7/92	
MONITORING WELL	MEASURING POINT ELEVATION	DEPTH TO WATER	WATER ELEVATION	DEPTH TO WATER	WATER ELEVATION	DEPTH TO WATER	WATER ELEVATION
MW-1	101.11	DRY		DRY		24.42	76.69
MW-2	91.78	11.47	80.31	11.87	79.91	10.36	81.42
MW-3	99.63	19.19	80.44	19.54	80.09	18	81.63
MW-4	68.52	17.44	51.08	18.57	49.95	17.71	50.81
MW-5	90.42	29.71	60.71	26.66	63.76	29.2	61.22
MW-6	79.38	18.88	60.5	18.89	60.49	18.92	60.46
MW-7	78.34	23.75	54.59	23.79	54.55	23.87	54.47
MW-8	91.78	25.4	66.38	25.4	66.38	24.95	66.83
MW-9	104.03	43.57	60.46	43.52	60.51	42.2	61.83
MW-10	99.69	38.54	61.15	37.7	61.99	38	61.69
MW-11	93.8	31.46	62.34	30.1	63.7	30.14	63.66
MW-12	94.14	31.9	62.24	33.4	60.74	31.37	62.77
MW-13	100.92	DRY		20.3	80.62	20	80.92
MW-14	100.62	25.51	75.11	21.55	79.07	19.08	81.54

TABLE 3-2: HYDRAULIC CONDUCTIVITY SUMMARY

MONITORING WELL	TEST DATE	HYDRAULIC CONDUCTIVITY IN CM/SEC
MW-1	2/27/90	2.19 E-02
MW-2	2/27/90	8.54 E-04
MW-4	2/27/90	8.82 E-04
MW-5	2/26/90	1.23 E-03
MW-6	2/26/90	3.82 E-03
MW-7	2/26/90	2.08 E-03
MW-8	2/26/90	1.38 E-03
MW-9	2/26/90	6.28 E-02
MW-11	6/26/92	4.60 E-04
MW-12	6/26/92	1.00 E-02

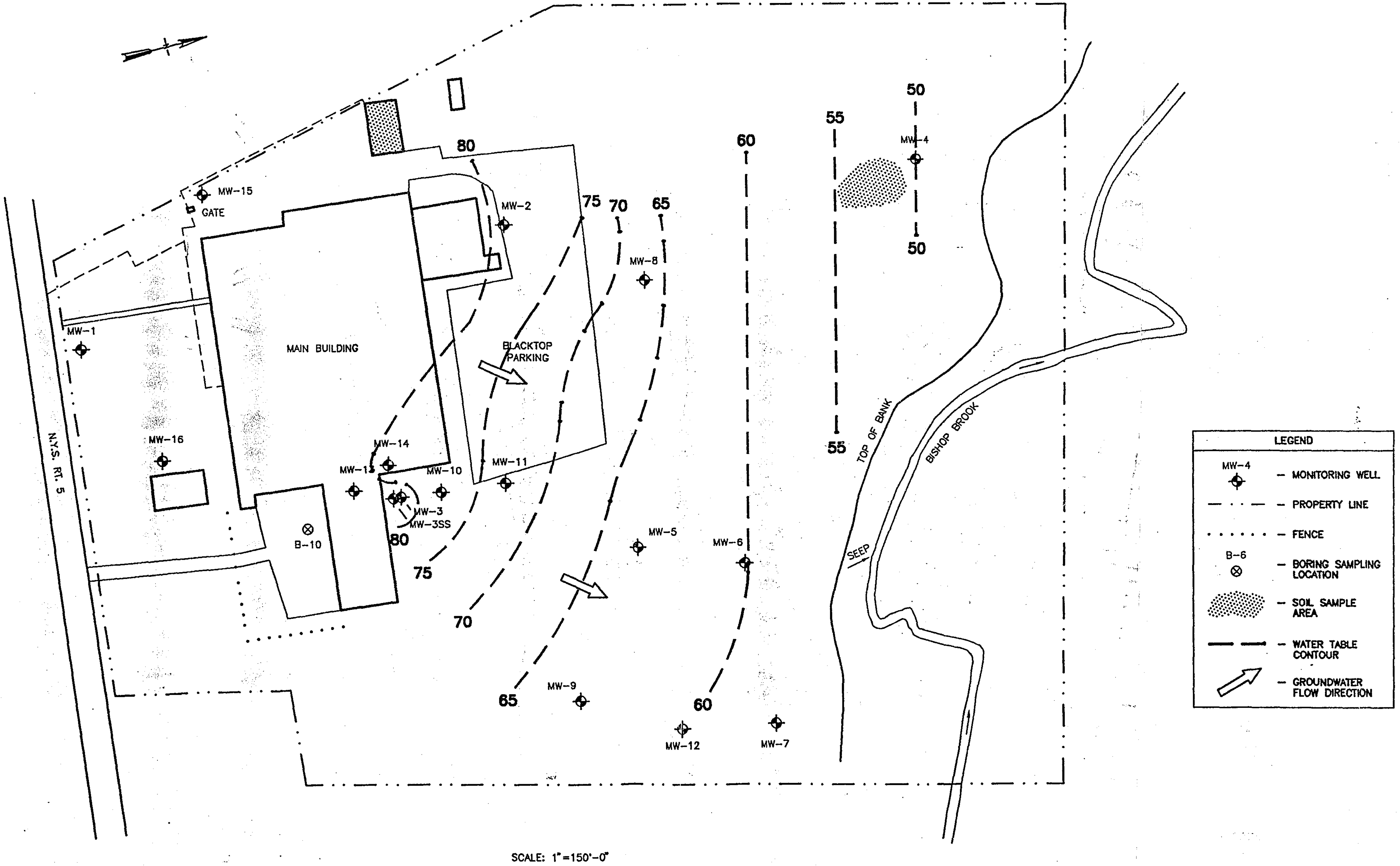


Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 3-5A
WATER TABLE CONTOUR MAP
28 MAY 1992

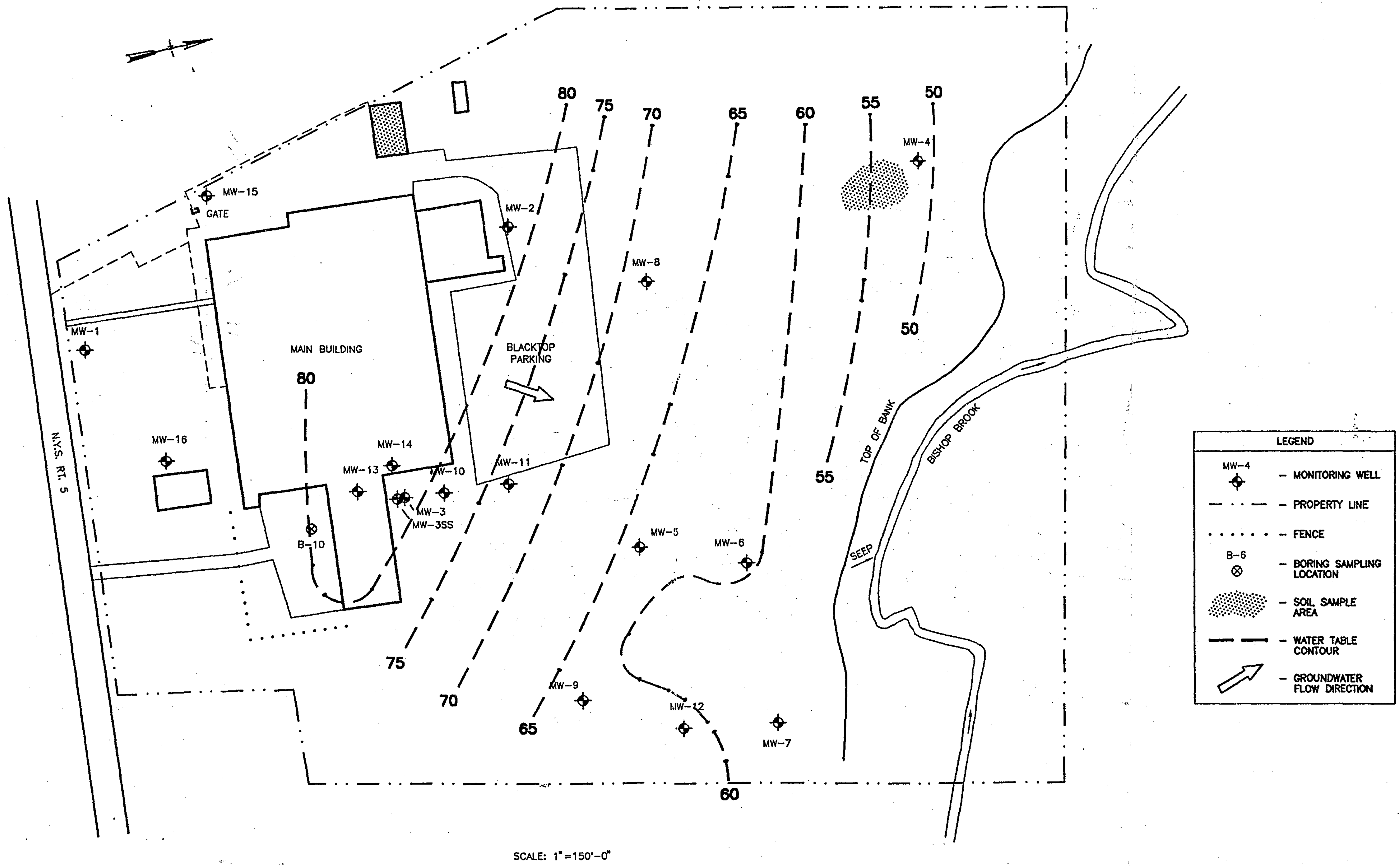


Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 3-5B
WATER TABLE CONTOUR MAP
26 JUNE 1992



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 3-5C
WATER TABLE CONTOUR MAP
7 AUGUST 1992

Brook embankment, a hydraulic gradient of 20 feet in 4809 feet, or .04 ft/ft, was calculated. Flow velocity is calculated using the following formula:

$$V = KI/n \times 2835$$

where:

V = Velocity in feet/day
K = Hydraulic conductivity in cm/sec
I = Hydraulic gradient
n = Porosity (estimated)
2835 = Conversion factor

$$V = \frac{1.31 \times 10^{-3} \text{ (cm/sec) } .04}{.30} \times 2835$$

$$V = .5 \text{ feet/day}$$

Analytical results from this investigation indicate that the bedrock aquifer has been impacted by site contamination, and therefore groundwater flow in bedrock is significant. Groundwater flow through fractured bedrock can be quite easily understood in a qualitative sense. However, quantifying the description of flow through fractured bedrock is extremely complex and requires a quantitative evaluation of the fractures that goes beyond the scope of this investigation. For the purposes of this investigation, it will be assumed that groundwater in bedrock is moving toward the north through bedding plane fractures, ultimately discharging to Bishop Brook. Our knowledge of Silurian shales in the area suggests that only the uppermost portion of the formation is significantly fractured and that fracture frequency and extent diminish with depth.

3.5 HABITAT ASSESSMENT

A qualitative habitat survey of the areas adjacent to Bishop Brook downstream to its confluence with Limestone Creek was performed to determine what potential receptors are present. The purpose of the survey was to identify the various habitats, including their flora and fauna, in the vicinity of the site and along Bishop Brook to determine sensitivity to potential impacts.

The habitat assessment identified 14 habitats based on vegetation associations. Species of vegetation were identified in each of the 14 areas and animal life was described in general for the area. The detailed habitat assessment is included as Appendix F.

CHAPTER 4

NATURE AND EXTENT OF CONTAMINATION

4.1 SOURCES

Investigations completed prior to this RI indicated that the contaminant of concern at the Accurate Die Casting facility is trichloroethene (TCE). This conclusion was consistent with the fact that a degreasing system using TCE as a solvent was in operation at the facility. The greatest concentration of TCE was found in the form of free product in MW-3 during the initial site investigation. MW-3 is located just outside the northwest corner of the east addition. The TCE degreasing system was located just inside the east addition wall from MW-3, and an above-ground storage tank for TCE was located on the outside wall of the east addition, just south of MW-3. The degreasing system, including the storage tank, was considered the probable source of TCE.

4.2 INVESTIGATION OBJECTIVES

Previous investigations resulted in the following conclusions:

1. TCE is the principal contaminant at the site.

2. The apparent source of TCE is the degreasing system at the northeast corner of the east addition.

3. TCE existed in the soil in the vicinity of MW-3.

4. TCE was found in the groundwater and was migrating toward the north, as indicated by MW-5 and MW-6. There was apparently little lateral movement, as indicated by Wells MW-2, MW-8, and to a lesser degree, MW-9.

5. A stream sample contained 5 ppb TCE, as compared to the NYSDEC guidance value of 11 ppb.

The objectives of this investigation were based on the above information and included:

1. Determining if the bedrock groundwater was impacted.

2. Determining quality in the overburden groundwater in the vicinity of MW-7 (a bedrock well).

3. Determining if stream sediments were impacted.

4. Investigating impact to soils at sites of new monitoring wells.

5. Confirming previous surface water and groundwater quality data.

6. Investigate potential impact by other TCL analytes, specifically metals.

In summary, the objective of the RI tasks was to more precisely characterize, in terms of vertical and horizontal migration, the nature and extent of previously identified site contamination. The findings are discussed below, organized by the media of concern. Laboratory validation reports are included as Appendix E.

4.3 ASSESSMENT OF TCE CONTAMINATION

A. **Groundwater.** Groundwater had previously been identified as the pathway of greatest concern. This investigation, together with previous studies at the site, have resulted in the following conclusions regarding the extent of TCE contamination. Analytical results for volatile organics in groundwater obtained in this investigation are presented on Table 4-1. All tables summarizing analytical results are found at the end of Chapter 4. TCE exists in its greatest concentrations in the vicinity of MW-3, where a pool of free product was identified in the early stages of this investigation. Most of the free product was recovered during an IRM conducted in 1990.

As part of this investigation, MW-13 and MW-14 were installed inside the building to the west and south of MW-3 to determine if remaining free product extended in those directions. It was possible that it did, because these locations are in the immediate vicinity of the degreasing system. The two borings encountered the lower silt layer before encountering groundwater or product. Minimal PID readings gave no indication of residual product in the area of those two wells. Based

TABLE 4-1: VOLATILE ORGANICS IN GROUNDWATER IN ug/L

SAMPLE ID	Trichloroethene	1,2-Dichloroethene	Methylene Chloride	Acetone	Tetra-chloroethene
MW-1					
MW-2					
MW-3	340000		16000 J	77000	
MW-4	6 J	9 J	10 U		
MW-5	110 J	6 J	10 U		4 J
MW-6	510	4 J			1 J
MW-7			10 U		2 J
MW-8			10 U		
MW-9	60		6 J		
MW-10	4500		10 U		
MW-11	5200		250 U		
MW-12	36		10 U		
MW-13	110 D		1 BJD		
MW-14	67				

SAMPLE ID	4-Methyl-2-Pentanone	2- Hexanone	1,1,2,2-Tetra chloroethane	Toluene	Others
MW-1*					1J
MW-2					
MW-3	18000 J	26000 J	6600 J	3000 J	
MW-4					
MW-5					
MW-6					
MW-7					
MW-8					
MW-9					
MW-10		3 J			
MW-11					
MW-12					
MW-13*					17 BDJ
MW-14*					

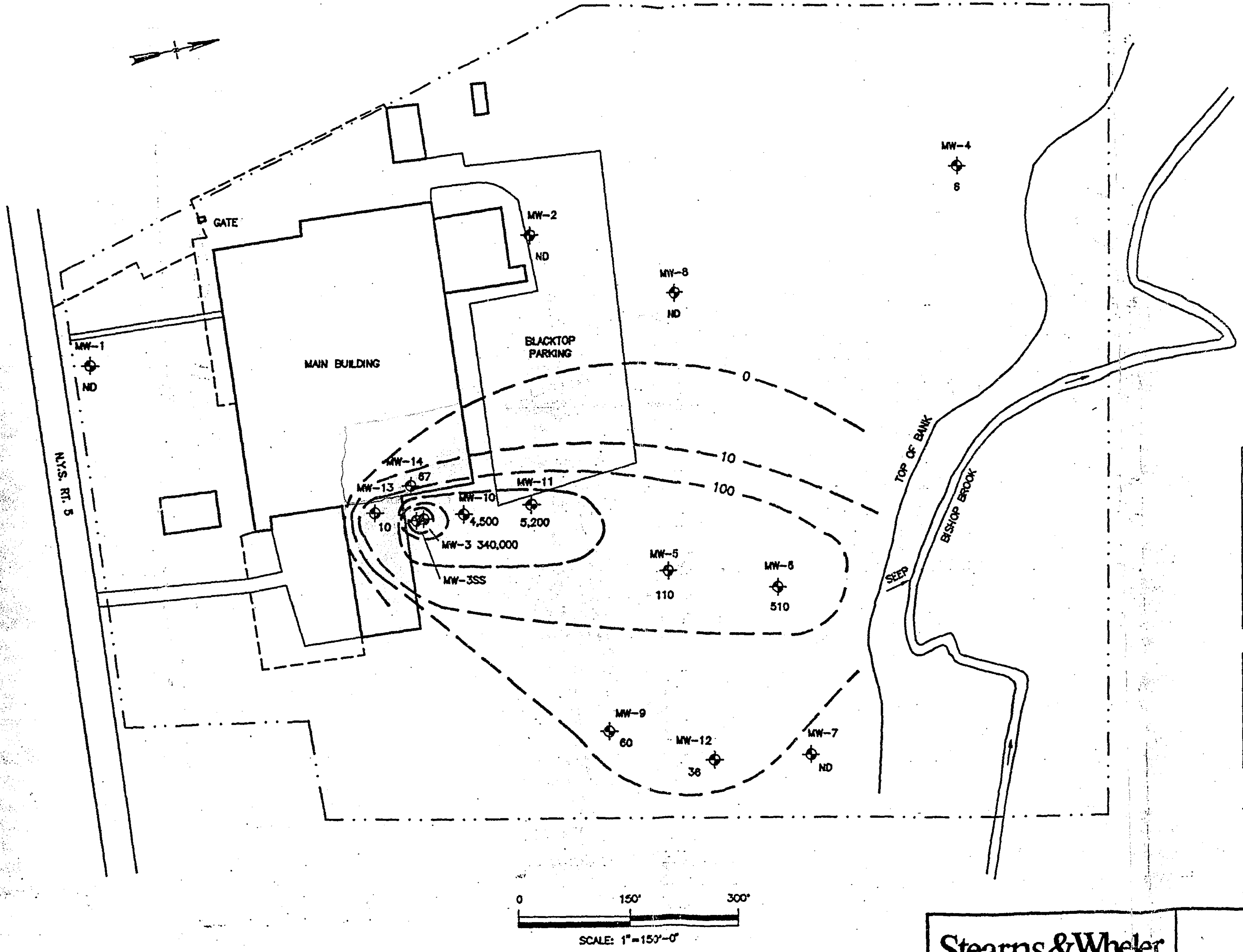
*SAMPLED 8/19/92 BECAUSE THEY WERE DRY ON ORIGINAL SAMPLING DATE.

RESULTS FOR MW-1, MW-13 AND MW-14 ARE PRELIMINARY AND UNVALIDATED AT THE TIME OF REPORT PREPARATION

TABLE 4-2: HISTORICAL REVIEW, TCE CONCENTRATIONS IN PPB

	8/30/89	12/4/~~98~~ 89	5/20/90	5/28/92
MW-1	112	ND	2.1	ND(1)
MW-2	ND	ND	1.3	ND
MW-3	Free Product	>55000	440000	340000
MW-4	NS	6.9	43.2	6
MW-5	NI	340	344	110
MW-6	NI	700	454	510
MW-7	NI	ND	ND	ND
MW-8	NI	ND	ND	ND
MW-9	NI	109	106	60
MW-10	NI	NI	NI	4500
MW-11	NI	NI	NI	5200
MW-12	NI	NI	NI	36
MW-13	NI	NI	NI	110(1)
MW-14	NI	NI	NI	67(1)
SEEP	NS	78	74	67

ND = Not Detected at concentrations greater than CRDL
NS = Not Sampled: wells, insufficient water: seep, not in initial scope
NI = Well not installed at time of sampling
(1) Sample collected 8/19/92 because these wells were dry on 5/28/9



LEGEND

- MW-4 ⊕ - MONITORING WELL
- — · · — - PROPERTY LINE
- — — — — - FENCE
- —— —— - CONTOUR INTERVAL = ORDER OF MAGNITUDE

NOTES

MW-1, MW-13, MW-14, SAMPLES COLLECTED 19 AUGUST 1992

MW-10, MW-11, MW-7 COMPLETED IN BEDROCK, CONTOURED AS A SINGLE UNIT

Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 9/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 4-1
TCE CONCENTRATION IN GROUNDWATER
2 JUNE 1992/19 AUGUST 1992

on investigative efforts, the free product was apparently confined to the immediate vicinity of MW-3 and has, to a large extent, been recovered.

The lateral extent of the dissolved phase in the overburden aquifer has been well defined by this and previous investigations. MW-12 was added to evaluate impacts to the northeast because the only other well in that area was MW-7, which is completed in bedrock. The results of groundwater sampling from this investigation are consistent with previous results, as shown in Table 4-2. High concentrations of TCE (340,000 ppb) were found in MW-3. Dissolved TCE is migrating toward the north with minimal east and west dispersion. MW-5 and MW-6, 340 and 500 feet north of MW-3, respectively, had 100 and 510 ppb TCE. To the east, MW-12 had 36 ppb and MW-9 had 60 ppb; and to the west, MW-8 showed no impact by TCE and MW-4 had 6 ppb. The concentrations of TCE in groundwater are plotted on Figure 4-1.

The area of impact is well defined to the west, with MW-4 and MW-8 apparently indicative of extent in that direction. MW-12 and MW-9 indicated that impact has extended that far to the east, but the relatively low concentrations suggest that the impact does not extend to the east a significant distance further.

The area of significant impact for TCE in the overburden aquifer has been defined as the area bordered by MW-3, MW-9, MW-8, and Bishop Brook.

An objective of this investigation was to determine whether the bedrock aquifer had been impacted. Previous investigations indicated no impacts to MW-7, and a layer with relatively low permeability at the base of the overburden that at least restricted the downward movement of the free phase TCE and possibly limited the downward movement of the dissolved phase. It was therefore assumed that the bedrock aquifer was not impacted.

MW-10 and MW-11 were installed 60 and 150 feet north of MW-3. Each well was screened in the top 10 feet of relatively competent bedrock, as compared to the highly weathered zone penetrated first. MW-10 had 4500 ppb and MW-11 had 5200 ppb, indicating that the bedrock aquifer has been impacted. This suggests that the low permeability layer is either not continuous in the vicinity of the spill, is fractured, or is sufficiently permeable to allow the downward migration of the dissolved phase. It is known that MW-7 is not impacted; other than that, the lateral, downgradient, and vertical extent of impact to the bedrock aquifer is not known. It can be assumed that Bishop Brook is a flow boundary for the bedrock aquifer.

Other compounds (4-methyl-2-pentanone, 2 hexanone, 1,1,2,2-tetrachloroethane and toluene) were also detected in MW-3 at reported concentrations ranging from 3,000 to 26,000 µg/l. Each of those values is quantified as not accurate or precise. Because of the 5,000-fold dilution of the MW-5 sample, the CRQL for organics was raised to 50,000 µg/l. The detected values are therefore 12 to 50 percent of the CRQL and are therefore relatively minor occurrences. The source of these other compounds is unknown, but they may be the result of impurities in the source solvents.

B. **Surface Water.** Bishop Brook was sampled in six locations along its course on Accurate Die Casting property. The rationale for sampling point selection took into account that the seep was an identified source, but that discharges of groundwater anywhere along the stream bed were a possibility. Stream water quality is summarized in Table 4-3. In addition to the stream water, the seep was sampled. Consistent with previous results of 78 and 74 ppb, 67 ppb were detected during this investigation at the seep. This confirms migration of TCE as far as the stream. No samples upstream of the seep were impacted, suggesting that there is no significant discharge of impacted groundwater to the stream along that reach. The first sample downstream of the seep, SW-4, approximately 40 feet away, indicated minimal impact with 3 ppb, although the data was qualified during validation as estimated (present, but not accurately quantified due to the low concentration). SW-5, approximately 500 feet downstream, showed no impact and SW-6 had the same results reported as SW-4.

The analytical results from the stream samples indicated that there was TCE in concentrations of approximately 3 ppb in two of thre samples, downstream of the seep.

C. **Stream Sediments.** Stream sediments were collected at the same six sampling points as the surface water samples. It was the intent of this task to determine if groundwater discharging to the stream through the stream bed was resulting in residual TCE in the stream sediment. At each sampling point, from one to three samples were collected from a vertical column. The number of samples collected from each location was dependent on the depth of the sediment. Samples were attempted from the surface, from 6 inches and from 12 inches. Samples were collected from the inside of a cylinder open at both ends. The cylinder was advanced into the sediment and allowed sampling from discrete intervals while preventing caving from the sides. Analytical results are presented in Table 4-4.

TABLE 4-3: VOLATILE ORGANICS IN SURFACE WATER IN ug/L

SAMPLE ID	Trichloroethene	1,2-Dichloroethene	2-Butanone	Methylene Chloride	Acetone
SW-1				10 U	
SW-2				10 U	
SW-3				10 U	25 U
SW-4	3 J			10 U	29 U
SW-5				10 U	32 U
SW-6	3 J			10 U	21 U
SW-7 (SEEP)	67			10 U	

TABLE 4-4: VOLATILE ORGANICS IN STREAM SEDIMENTS IN ug/kg

SAMPLE ID	Trichloroethene	1,2-Dichloroethene	2-Butanone	Methylene Chloride	Acetone	TOC
BB1A				12 U	12 U	10935
BB2A				13 U		
BB2B				12 U	12 U	41232
BB3A		2 J	14 U	21 U	36 U	60609
BB3B				12 U	12 U	46131
BB4A				11 U		
BB4B				17 U		49074
BB5A			2 J	24 U	20 U	
BB5B	0.8 J			22 U	18 U	
BB6A				13 U	13 U	
BB6B				32 U		
BB6C				22 U	14 U	

With the exception of four positive results at or below detection limits, there are no data to suggest that the stream sediments have been impacted. The four positive results from the 12 samples are all qualified as either imprecisely quantified due to the low concentration or as present in the blanks.

Based on the surface water and sediment results, it is concluded that stream sediments are not impacted to the extent that would cause the surface water to exceed standards or guidance values for TCE or other measured organic compounds. This conclusion is consistent with what is known about the site. Because the stream bed is apparently in or, in most places, very near bedrock, the main pathway of migration is surface seepage, such as the one known primary seep. If TCE is entering the stream at the stream surface, it would rapidly volatilize, as is evident from comparing analytical results of the surface water to the seep. Given this migration pathway, it is improbable that the TCE could become entrained in the sediment or adsorbed to sediment particles, as demonstrated.

D. **Soils.** To evaluate TCE concentrations, one or two soil samples were collected from each of the five borings installed in this investigation. Sample intervals were selected based on highest PID readings or in cases of no significant PID readings, from just above the water table where vapor migration was expected to be most likely. Existing knowledge of the site allows the conclusion that the only place residual TCE would be in the unsaturated soil column would be in the immediate vicinity of MW-3.

Table 4-5 summarizes the findings of TCE in the soil borings. Low levels were detected from 17.5 to 19.5 feet in MW-13 and from 30 to 32 feet in MW-11. More significant concentrations were detected in MW-10 with 840 ppb from 24.5 feet to 26.5 feet and 390 ppb from 27.5 feet to 31.8 feet. None was detected in MW-12, and a qualified measurement of 5 ppb was detected in MW-14.

These results support the conclusion that the greatest concentrations of TCE in the unsaturated zone are isolated near MW-3. MW-10 is 60 feet from MW-3 and vapor migration could account for the concentrations in that boring. Further away from the source, significant vapor migration is not indicated.

TABLE 4-5: VOLATILE ORGANICS IN SOIL IN ug/kg

RI/FS DATA

SAMPLE ID	LOCATION	DEPTH	Trichloroethene	Methylene Chloride	Acetone
SS-1 (MW10(24.5))	MW-10	24.5-26.5	840	6 J	
SS-2 (MW10(27.5))	MW-10	27.5-31.8	390		250
SS-3 (MW11(30-32))	MW-11	30-32	30	2 J	24
SS-5 (MW12SS5)	MW-12	20-26.5			
SS-7 (SS-7)	MW-13	17.5-19.5	38	11 U	
SS-9 (SS-9)	MW-14	4-8	5 J	11 U	
SS-10 (SS10)	MW-14	25-26.5		11 U	
ST-1	SEPTIC TANK			12 U	12 U

PHASE 2 DATA

mg/kg

LOCATION	DEPTH	TCE
MW-1	19-21	ND
MW-2	2-4	ND
MW-3	4-6	1.8
MW-3	19-21	7500
MW-4	2-4	ND
B-1	8-10	ND
B-3	2-4	ND
B-4	19-21	ND
B-8	2-4	ND
B-9	15-16.5	ND
B-11	25-25.6	1.3
B-12	24-25.8	1.8
B-13	15-17	4.5
B-13	24-24.5	4.2
B-14	15-17	0.8
B-15	18-18.3	6.6
B-16	15-17	2.7
B-17	15-17	ND

TABLE 4-6: TOTAL METALS IN GROUNDWATER IN ug/L

	METAL NAME	GW STANDARD	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
200	ALUMINUM		966 J	22400 J	544 J	2590 J	1320 J	212 J	2540 J	17700 J	3150 J	195 J	15800 J
100	ANTIMONY	3G								75.3			
	ARSENIC	25						UJ	UJ				
	BARIUM	1000	111 J	198 J	59.5 J	150 J	186 J		55.8 J	661	134 J	179 J	924
	BERYLLIUM	3G	UJ	UJ	UJ	UJ	UJ	UJ	UJ	1.3 J	UJ	UJ	UJ
	CADMIUM	10											
	CALCIUM		69900	119000	50000	101000	77800	479000	65900	276000	59600	68000	237000
500	CHROMIUM	50		23.5						430			37.9
10	COBALT			11.7 J						30.8 J			15.5 J
100	COPPER	200		40.8		11.5 J	12.5 J		21.5 J	67.7	27.1	7.7 J	47.9
300	IRON	300	3190 J	28600	544 J	3040 J	1290 J		4280 J	36000	4250 J	62.8 J	25800 J
20	LEAD	25		13.6 J		3.4 J				13.1 J	6.2 J		11.2 J
	MAGNESIUM	35000G	28300	48400	10700	24700	25800	41900	57600	100000	25600	28100	84500
	MANGANESE	300	659 J	654 J	74.4 J	231 J	85.1 J	13.7 J	118 J	1420 J	66 J	5.3 J	789 J
0.8	MERCURY	2	0.39 J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
200	NICKEL			32.5 J					31.9 J	431	21 J		28 J
	POTASSIUM			13300		3360 J	2300 J	3800	3190 J	6630	3330 J	2260 J	8100
	SELENIUM	10						UJ	UJ	UJ			
100	SILVER	50	UJ	15.4 J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
	SODIUM	20000	12900	18900	4310 J	3710 J	3950 J	26500	8210	11800	6210	22900	35500
	THALLIUM	4G								UJ			
30	VANADIUM			36.6 J						35 J			29.1 J
300	ZINC	300		92.4 J		12.5 J			197 J	90.5 J	141 J	137 J	73.6 J

TABLE 4-7: DISSOLVED METALS IN GROUNDWATER IN ug/L

METAL NAME	GW STANDARD	DMW-2	DMW-3	DMW-4	DMW-5	DMW-6	DMW-7	DMW-8	DMW-9	DMW-10	DMW-11	DMW-12
ALUMINUM			50.2 J									
ANTIMONY	3G											
ARSENIC	25	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
BARIUM	1000	96.7	29 J	59.8 J	148 J	157 J		40.9 J	159 J	117 J	178 J	134 J
BERYLLIUM	3G	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
CADMIUM	10											
CALCIUM		64400	24200	53400	106000	73500	466000	61000	72900	49700	69100	61100
CHROMIUM	50											
COBALT												
COPPER	200											
IRON	300	168 J					100 J					
LEAD	25											
MAGNESIUM	35000G	26900	6970	11500	23800	26100	44300	57600	22600	19900	28900	22800
MANGANESE	300	245		1.4 J			15.1 J	6.7 J		6.6 J		56.3
MERCURY	2	UJ	UJ	UJ	UJ	UJ	UJ	UJ		UJ	UJ	UJ
NICKEL									59.6			
POTASSIUM			9480	1820 J			3060 J	2880 J		5210	2720 J	4360 J
SELENIUM	10							UJ				
SILVER	50											
SODIUM	20000	13000	21100	4300 J	3770 J	3880 J	28200	8650	12900	6140	23300	37500
THALLIUM	4G											
VANADIUM												
ZINC	300											

4.4 ASSESSMENT OF METALS CONTAMINATION

Groundwater, soil, sediment, sludge from the abandoned septic tank, and surface water samples were analyzed for Target Analyte List (TAL) metals. Samples for metals analysis were not collected from MW-1, MW-13, or MW-14 because there was not enough water in the wells. Results of these analyses are discussed below.

A. **Metals in Groundwater.** Metals in groundwater were evaluated in samples from all on-site monitoring wells except for MW-1, MW-13, and MW-14, which contained insufficient water for the analyses. Samples for metals analysis were collected in duplicate, one aliquot was containerized immediately upon removal from the well, and the second aliquot was field filtered. The two samples allowed analysis for total and dissolved concentrations of metals. NYSDEC requires total metals for comparison to standards. Analysis of total metals also quantifies the elements in the particulate material suspended in the water sample, however, which are not indicative of the true water chemistry. To develop an understanding of the water chemistry and to better assess impacts by dissolved constituents, analyses of the filtered samples are also interpreted.

In reviewing the total metals concentrations, NYSDEC standards are exceeded for iron, manganese, magnesium, and sodium in four or more wells. Chromium is the only heavy metal that exceeded NYSDEC standards. It was detected at 430 ppb in MW-9. Chromium was detected below standards in MW-3 (23.5 ppb) and MW-12 (37.9 ppb).

In evaluating the results of the filtered samples, only magnesium and sodium exceeded NYSDEC standards or guidance values. No chromium was detected in the filtered samples.

B. **Metals in Surface Water.** Six stream water samples and the seep were evaluated for TAL metals. Results are summarized on Table 4-8, and validation reports are found in Appendix E.

Most TAL analytes were not detected above method quantification limits, and all analytes were below NYSDEC standards and guidance values for surface water.

C. **Metals in Stream Sediments.** At each point in Bishop Brook where surface water samples were collected, corresponding sediment samples were collected. Samples were collected

TABLE 4-8: METALS IN SURFACE WATER IN ug/L

METAL NAME	SW STANDARD	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7
ALUMINUM	100	36.3 U	36.3 U	36.3 U	36.3 U	36.3 U	36.3 U	36.5
ANTIMONY	3G	35.7 U	35.7 U	35.7 U	37.7	35.7 U	35.7 U	35.7 U
ARSENIC	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
BARIUM	1000	82.3	87.9	84.8	87.8	88.8	82.9	159
BERYLLIUM	3G	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
CADMIUM	10	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
CALCIUM		142000	141000	144000	151000	157000	156000	85800
CHROMIUM	50	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ
COBALT	5	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U
COPPER	200	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ
IRON	300	11.2 U	11.2 U	11.2 U	11.2 U	11.2 U	11.2 U	11.2 U
LEAD	50	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
MAGNESIUM	35000	23200	23900	24400	25200	26000	25400	28700
MANGANESE	300	1.3 UJ	3.4 UJ	2.0 UJ	1.4 UJ	1.4 UJ	1.3 UJ	1.5 UJ
MERCURY	2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
NICKEL	*	30.6 U	30.6 U	30.6 U	30.6 U	30.6 U	30.6 U	30.6 U
POTASSIUM		1960 UJ	1780 UJ	2170 UJ	2540 UJ	2440 UJ	1380 UJ	1190 U
SELENIUM	10	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
SILVER	50	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ
SODIUM		25100	27300	27100	27100	27800	27100	5500
THALLIUM	4G	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
VANADIUM		4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
ZINC	300	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U

* EXP(0.76[LN(PPM HARDNESS)]+1.06) AT THIS SITE HARDNESS = 482, Ni STANDARD IS 316

from 0 to 6 inches, 6 to 12 inches, and 12 to 18 inches, or as depth of sediment allowed. Analytical results are summarized in Table 4-9. Validation reports are found in Appendix E.

A review of the data indicates that the metals cadmium, chromium, mercury, and selenium are present at the two most downstream sampling points, and absent at sampling points BB-1 down to BB-4. A possible explanation for this is the stormwater discharge that existed near the west end of the site that had been discussed in previous phases of investigation. The significance of the presence of the metals in the sediment is discussed in Chapter 6, Risk Assessment.

D. **Metals in Soil.** Metals results in site soils collected from borings installed in this investigation are summarized in Table 4-10. Supporting information is found in the appendices. Like sediments, there are no standards for metals in soil. Elevated metals in soils can become a concern if a pathway of exposure exists. No exposure to the metals in the borings is expected; additional discussion of exposure pathways is presented in the baseline risk assessment (Chapter 6).

E. **Metals in Septic Tank Sludge.** Metals results from this matrix presented in the appendix. Again, there are no promulgated standards against which these results can be compared. While there are other metals present, zinc is the only element that is elevated, as compared to the soils samples, indicating that process water may historically have been routed to the septic tank. This material appears to be confined to the tank.

TABLE 4-9: METALS IN STREAM SEDIMENTS IN mg/kg

METAL NAME	BB-1A	BB-2A	BB-2B	BB-3A	BB-3B	BB-4A	BB-4B	BB-5A	BB-5B	BB-6A	BB-6B	BB-6C
ALUMINUM	5830	6650	6480	5430	4870	5850	6150	7510	7260	7010	4160	6480
ANTIMONY	17.5 J	UJ	UJ	UJ	UJ	UJ	UJ	17.4 J	19.6 J	9.0 UJ	7.5 UJ	12.2 J
ARSENIC	1.8 J	1.5 J	UJ	1.9 J	1.7 J	1.6 J	1.7 J	3.6	2.3	2.1	1.4	2.8
BARIUM	43.3 J	208	422	49.1 J	24.8 J	58.4 J	73.9	67.8	40.5	35.1	38	42.8
BERYLLIUM	0.33 U		0.24 U	0.42 U				0.4	0.55	0.33	0.27	0.4
CADMIUM								1.1 U	0.95 U	0.96 U	0.80 U	1.0 U
CALCIUM	168000	115000	139000	93100	146000	107000	143000	118000	141000	122000	82500	117000
CHROMIUM	2.4 J	4.2	3.5				3.4	13.1	14.7	12.8	7.4	12.1
COBALT	5.0 J	5.6 J	4.6 J	4.6 J	2.8 J	3.9 J	3.0 J	5.2	5.5	5.2	3.5	3.9
COPPER	4.7 J	6.4	2.9 J	11.5	7.1	4.9 J	5.2 J	5.0 J	6.5 J	4.2 J	6.1 J	4.5 J
IRON	9980	9600	9970	9880	7960	8680	8840	11800	14200	11500	6660	9410
LEAD	9.0 J	6.8 J	7.7 J	14.9 J	5.1 J	14.9 J	11.5 J	28.9	12.7	8.2	9.2	9.1
MAGNESIUM	39800	21700	25800	20000	30200	18200	18500	24200	32800	29500	13000	25400
MANGANESE	287 J	215 J	239 J	202 J	271 J	224 J	249 J	333	273	223	122	159
MERCURY								0.14 U	0.13 U	0.13 U	0.11 U	0.14 U
NICKEL	11.5	10.3	12	8.8 J	8.3 J	8.5 J	9.1 J	10.8	15.7	11.4	8.6	12.2
POTASSIUM	980 J	1600	1080 J	1230 J	1180 J	1440 J	1150 J	1350	1490	1560	938 U	1710
SELENIUM	UJ		UJ					1.4 UJ	1.3 U	1.3 UJ	1.1 U	1.4 U
SILVER	UJ	3.4 J	UJ	UJ	UJ	UJ	UJ	2.7 UJ	2.5 UJ	2.5 UJ	2.1 UJ	2.7 UJ
SODIUM								133 U	136	122 U	102 U	131 U
THALLIUM					UJ			1.4 U	1.3 U	1.3 U	1.1 U	1.4 U
VANADIUM	12.2	13.5	11.9	12.1 J	10.3 J	11.5 J	10.8 J	14.7	14	14.2	9.4	12.6
ZINC	49.7	59.9	44.9	62.6	36.2	75.4	173	67.1	53.1	51.7	50	56.5

TABLE 4-10: METALS IN SOIL IN mg/kg

	SS-1	SS-2	SS-4	SS-5	SS-3	SS-7	SS-9	ST-1
METAL NAME	MW10(24)	MW10(27)	MW11(30)	MW12(SS)	SS-10X	SS-7X	SS-9X	Septic tank
ALUMINUM	24800	19900	16900	8930	15000	6130	6800	15100
ANTIMONY	25.1 J	28.2 J	24.2 J	20.9 J	24.6 J	19.1 J	24.1 J	19J
ARSENIC	4.9 J	R	3.0 J	3.1 J	2.2 J	3.3 J	2.6 J	6.7
BARIUM	48.2	71.6	48.5	25.8 J	33.4 J	45.3	24.2 J	83.5
BERYLLIUM	1.0 J	0.74 J	0.81 J	0.51 J	0.55 J			0.87
CADMIUM	UJ	UJ	UJ	UJ	UJ	UJ	UJ	0.9U
CALCIUM	36200	70600	92300	171000	69500	162000	150000	55500
CHROMIUM	45	34.2	32.5	16.7	30.1	10.8	12.3	27
COBALT	25.1	9.1 J	5.8 J	5.4 J	10.8 J	4.0 J	4 J	12.3
COPPER	32.5 J	2.5 J	5.4 J	12.5 J	14.8 J	14.5 J	17.2 J	65.7J
IRON	28300	21200	16500	10000	21100	8920	11800	24600
LEAD	22.4 J	1.8 J	7.6 J	10.8 J	9.9	4.5 J	7.4 J	23.3
MAGNESIUM	31000	46900	54300	65400	50900	65300	71400	28000
MANGANESE	263 J	264 J	276 J	231 J	292 J	235 J	422 J	891
MERCURY	0.12		21.1		0.14	0.25		.12U
NICKEL	46.4	28.2	6600	15.3	32.1		9.6	28.2
POTASSIUM	8590	6350	R	3590	3450	2320	2160	2200
SELENIUM	R	R		R	R	R	R	1.2U
SILVER			262 U					2.3UJ
SODIUM	168 U	178 U	UJ	165 U	201 U	171 U	182 UJ	126
THALLIUM	UJ	UJ	26.6	UJ	UJ	UJ	UJ	1.2U
VANADIUM	39.6	27.2	22.4	20	22.1	13.5	15	31.9
ZINC	46.7	30.3	Q	45	29.8	39.7	37.9	644

CHAPTER 5

CONTAMINANT FATE AND TRANSPORT

As discussed in the previous chapter, trichloroethene (TCE) has been shown to be the contaminant of concern at the Accurate Die Casting facility. TCE is a chlorinated organic solvent which has been heavily used in a variety of industrial applications since the 1940s. The physical properties of TCE cause it to behave very differently in the environment than common dissolved constituents, such as chloride or sulfate. Section 5.1 reviews the basic processes which influence the distribution, mobility, and persistence of TCE in the environment. This discussion provides technical background for the site-specific analysis of TCE distribution presented in Section 5.2.

5.1 OVERVIEW OF PROCESSES AFFECTING TCE DISTRIBUTION

TCE exhibits moderately low water solubility of 1100 mg/l, or about 1 percent by weight. This value is substantially higher than the maximum contaminant level (MCL) for TCE, thus groundwater can be contaminated to hazardous levels by dissolved phase TCE. In addition, the low solubility of TCE means that significant amounts may be present as pure phase TCE liquid, or free product. TCE is also a relatively volatile compound, thus movement of TCE in vapor phase may be important under some conditions. The affinity of TCE for the organic portion of soil particles also influences TCE mobility and distribution. Finally, biological processes may degrade or transform TCE. Each of these processes is discussed briefly below.

A. **Free Product Behavior.** Due to its low water solubility, TCE may persist in liquid form in the subsurface for long periods of time. Liquid TCE released near the land surface will tend to migrate downward through unsaturated soils due to its low viscosity. Liquid TCE is also considerably denser than water, so it tends to sink through the saturated zone if TCE quantities and aquifer permeability permit. This vertical sinking is virtually unaffected by horizontal groundwater flow (Schwille, 1988).

In order to sink through the saturated zone, liquid TCE must displace water already present in the soil pore spaces. This displacement requires substantial pressure from the weight of overlying TCE. Small globules of liquid TCE tend to be trapped in pore spaces as the TCE front moves downward, thus the driving pressure for migration is eventually depleted once the source is cut off. This trapped, or "residual," TCE may slowly vaporize or may dissolve into flowing groundwater, but it can not flow as free product.

The pressure required for migration of liquid TCE also increases with decreasing grain size of the porous medium. This means that downward migration of TCE may cease if the TCE front reaches a low permeability layer in the subsurface (Schwille, 1988). This low permeability layer may be either bedrock or fine-grained (silty or clayey) unconsolidated sediments. The liquid TCE will tend to spread out on this low permeability surface.

B. **Dissolved Phase Transport.** TCE which dissolves into groundwater flows with that groundwater much as do common dissolved solutes, such as sodium or chloride. This process is termed advection. Acting alone, advection results in average TCE flow velocities that are equal to mean groundwater flow velocities.

Dispersion is a process which tends to spread out a mass of dissolved TCE or other solute, both longitudinally and transverse, to the direction of groundwater flow. Dispersion also decreases the concentration of TCE at a given point as the solute mass moves downgradient with groundwater flow. Recently, a number of studies have indicated that dispersion of dissolved TCE may be minimal in the direction transverse (perpendicular) to groundwater flow (Mackay et al., 1985; Schwille, 1988). This is particularly true for groundwater flowing through coarse sand or gravel aquifers, where spreading transverse to groundwater flow may be very minor.

Movement of dissolved TCE may also be affected by adsorption of the TCE to soil particles. This causes the average flow rate of TCE to be slower than the average flow rate of groundwater. This process, called retardation, may cause pronounced slowing of TCE movement in fine grained, organic-rich aquifers. Retardation is much less important in clean sand and gravel aquifers, where TCE may flow as rapidly as groundwater itself.

C. **Vapor Phase Transport.** Liquid TCE which passes downward through the unsaturated zone leaves behind residual droplets of TCE in small pore spaces (Schwille, 1988). This TCE volatilizes, forming a relatively heavy gas which migrates outward through the unsaturated zone. Although a small amount of this vapor may diffuse upward into the atmosphere, much of it moves outward and downward in the unsaturated zone.

Vapor phase TCE may partition into soil moisture, where it can be flushed to the groundwater by water table fluctuation or downward percolation of precipitation (Mendoza and Frind, 1990). TCE vapor may also diffuse across the capillary fringe into the underlying groundwater (Mendoza and McAlary, 1990). Finally, TCE in the unsaturated zone may adsorb to soil particles.

As a result of these vapor phase processes, low concentrations of TCE may be observed in soil, soil moisture, and soil vapor at some distance from the actual spill. Moreover, vapor phase transport and migration downward to groundwater may result in small amounts of TCE in groundwater upgradient or crossgradient from a spill.

D. **Biodegradation.** Biodegradation by microorganisms may be an important process affecting the fate of TCE in the natural environment. In general, TCE may biodegrade under either aerobic (oxygenated) or anaerobic conditions. The rate of biodegradation depends on the physical properties of the aquifer, such as temperature and oxygenation; the presence of enhancing or inhibiting compounds; or the quantity of TCE present. The basic processes of biodegradation are described below:

Under oxygenated conditions, TCE and related compounds, such as dichloroethene (DCE) and vinyl chloride (VC) have been observed to degrade through a series of reactions to carbon dioxide (e.g., Wilson and Wilson, 1985; Little, et al., 1988; Lanzarone and McCarty, 1990). Laboratory experiments conducted under conditions optimal for biodegradation have resulted in removal of up to 95 percent of TCE from contaminated soil (Wilson and Wilson, 1985). Although aerobic degradation under field conditions may be lower, this process is important because it can cause a net conversion of TCE to harmless substances.

Biotransformation of TCE and related compounds under non-oxygenated conditions has also been extensively studied (e.g. Barrio-Lage, et al., 1986; Wilson, et al., 1986; Fathepure, et al., 1987). Anaerobic biotransformation of these compounds is different from aerobic degradation in that anaerobic decay products are often more hazardous than their parent compounds. The anaerobic decay process causes successive dehalogenation of tetrachloroethene (PCE) and TCE through DCE to vinyl chloride. Decay rates observed in laboratory experiments have varied widely. Vogel and McCarty (1985) observed essentially complete degradation of PCE and TCE to VC within 10 days, while Wilson, et al. (1986) found no significant TCE decay until 16 days after the beginning of degradation experiments. Even if decay rates are slow, however, one would expect the appearance of vinyl chloride to indicate that anaerobic degradation is occurring.

5.2 TCE DISTRIBUTION AND FATE AT ACCURATE DIE CASTING SITE

The following discussion addresses the observed concentrations of TCE at the Accurate Die Casting facility in light of the known behavior of TCE in the environment. This information may then be used as background for both the risk assessment and the recommendations for further actions that follow.

A. **Groundwater and Subsurface Soils.** The existence of free product TCE discovered during the Phase II assessment was of great concern in subsequent investigative and remedial activities at the site. As previously discussed, liquid TCE was encountered in Monitoring Well MW-3. This liquid TCE was perched upon a dense clay layer encountered at the base of Well MW-3. Subsequent borings and monitoring wells in the vicinity of MW-3 failed to encounter any evidence of free product TCE. A recovery well, MW-3SS, was installed in 1990 and free product was recovered until most of the subsurface liquid TCE was removed.

The observed distribution of free product at the site suggests that liquid TCE was released in the vicinity of Well MW-3 during facility operation. Although some of this TCE may have volatilized, the remainder migrated downward through the unsaturated zone, leaving small amounts of residual TCE behind as it passed. When this TCE reached the saturated zone, flow would have slowed due to the buoyant forces exerted by the groundwater, and the fact that TCE would now have to displace water to flow downward.

Continued downward TCE flow through the saturated zone requires continued pressure from overlying TCE. This flow will stop if either the volume of overlying TCE is depleted, or if a sufficiently fine grained soil layer is reached. At the Accurate site, it is believed that the dense clay encountered at the base of Well MW-3 was sufficiently fine grained to halt the downward progression of TCE. Spreading of liquid TCE above the clay layer could occur only with continued input of TCE. The wells and borings surrounding MW-3 delimit the outward extent of free product migration. Furthermore, removal of liquid TCE from the MW-3 area removed the impetus for outward or downward migration of liquid TCE. The small amounts of liquid TCE residual left in the unsaturated and saturated zones are therefore the available sources for continued contribution of dissolved or vapor phase TCE to the site. The residual TCE itself is not expected to be mobile.

TCE may vaporize from either residual liquid or underlying groundwater. Because TCE vapors are relatively mobile in unsaturated soils, it is common to find low concentrations of TCE in soils surrounding (including upgradient from) a residual TCE source. The distribution of TCE observed in the unsaturated zone indicates a minimal distribution of vapor in the soils across the site. This is discussed thoroughly in the Phase II report.

Because soil/soil vapor TCE concentrations are very low, and any remaining residual TCE is expected to be immobile, dissolved TCE in groundwater is the contaminant of interest at the site. Dissolution of any remaining residual TCE is expected to continue to contribute dissolved TCE to groundwater. Concentrations are not expected to increase, however, because the majority of the TCE source has been removed. If no further remedial actions were taken at the site, dissolved TCE concentrations would decrease when the residual TCE was essentially used up. This could take many years due to the low water solubility of TCE.

As discussed in Chapter 4, the highest concentrations of dissolved TCE were observed in overburden Well MW-3, with lower concentrations to the north in overburden Wells MW-5 and MW-6 (Table 4-1). Much lower concentrations were observed in wells to the east and west of the northerly groundwater flow path from MW-3 to the seep (Figure 4-1). This indicates that the plume of dissolved TCE at the site is quite narrow. The existence of a narrow plume is consistent with the relatively coarse grained nature of the aquifer. Studies have shown that TCE plumes tend to be narrow in coarse sand and gravel aquifers. It is therefore believed that the overburden plume has been well delineated by samples obtained to date.

Based on data obtained in the Phase II assessment it was believed that the low permeability clay/till layer at the site had prevented migration of TCE into the bedrock aquifer. Data obtained from Wells MW-10 and MW-11 during this investigation indicate, however, that some impact to the bedrock aquifer has occurred. It is believed that downward flow of free product was halted by the clay layer at MW-3, thus creating the pool of liquid TCE that was subsequently removed. Dissolved TCE flows with groundwater, however, and could therefore penetrate to the bedrock aquifer downgradient (north) of MW-3 at any break in the clay/till confining layer.

The concentrations of TCE observed in MW-10 and MW-11 are approximately 200 times below the solubility of TCE in water, and thus are believed to represent dissolved, not liquid, TCE. The fact that these concentrations are higher than those observed in Wells MW-5 and MW-6 is due in part to the proximity of Wells MW-10 and MW-11 to the source. In addition, less sorption of TCE occurs during flow through fractured bedrock than during flow through soil, thus concentrations in bedrock may not abate as rapidly with distance.

Although flow of groundwater through fractured bedrock is complex and difficult to quantify, the degree of fracturing is expected to decrease with depth in these rocks, as previously discussed. Furthermore, the lack of contamination at Well MW-7 seems to indicate that lateral spreading of dissolved TCE in the bedrock aquifer is limited.

It should be noted that a breakdown product of TCE, trans 1,2-dichloroethene, was detected in Monitoring Wells MW-4, MW-5, and MW-6. Monitoring Wells MW-5 and MW-6 are directly downgradient of the area where free product TCE was encountered. The presence of DCE in Wells MW-5 and MW-6 is possibly the result of the dehalogenation of TCE. The presence of TCE in Monitoring Well MW-4 may be associated with the nearby discharge pipe. Subsequent analysis of soil in this area has also indicated the presence of DCE. This suggests that TCE in the area has begun to biodegrade into its daughter products.

B. **Surface Water and Creek Sediments.** As discussed in Chapter 4, the primary route for TCE migration to Bishop Brook and its sediments is at the observed surface seep (Figure 4-1). TCE concentrations observed at the seep have ranged from 67 to 78 ppb. Because of the high volatility of TCE, concentrations in surface water would be expected to drop rapidly upon exposure to air. This volatilization, combined with dilution, results in the very low (3 ppb) TCE concentrations observed in stream samples downgradient from the seep. Such low concentrations are not sufficient to cause significant contamination of underlying sediments, as shown by sediment test results.

Concentrations of TCE in the seep (and hence in Bishop Brook) are not expected to increase since TCE is no longer being added to the system at the source near MW-3. Concentrations may, however, remain the same for some time due to the presence of upgradient groundwater contamination. Nevertheless, concentrations in Bishop Brook are extremely low and essentially disappear due to volatilization between the seep and the downstream site boundary. Furthermore, because of the oxygenated condition of the stream, degradation of TCE to DCE or vinyl chloride will not occur in this environment, as shown by the lack of these compounds in any stream or sediment samples.

CHAPTER 6

BASELINE RISK ASSESSMENT

6.1 INTRODUCTION: SCOPE AND STANDARD PROCEDURES

Risk assessments are conducted as an integral part of the Remedial Investigation/Feasibility Study process. The baseline risk assessment characterizes and quantifies the risk to human health posed by on-site conditions. The analysis of risk at the site helps determine the need for and extent of potential remedial actions. Remedial activities are evaluated for their efficacy in reducing risk to human health and the environment.

Methodologies presented in United States Environmental Protection Agency (USEPA) 1988, 1989, 1990, and 1991 guidance documents were used in preparing the risk assessment. The format for this chapter is consistent with USEPA 1989 interim final publication: Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A).

As defined by USEPA guidance, the baseline risk assessment has four activities: data collection and evaluation, exposure assessment, toxicity assessment, and risk characterization.

Data collection and evaluation defines the spatial distribution of site-related chemicals and identifies potential chemicals of concern. Data are screened for technical defensibility and the existence of quantitative toxicity information.

Exposure assessment considers the pathways by which humans or other populations might realistically be exposed to site chemicals, both now and in the future. This activity also quantifies, to the extent possible, the concentrations of chemicals to which receptors could be exposed. It is important to note that exposure can only occur when a mechanism for transport and a receptor exist along with a chemical source.

After representative exposure from site-related chemicals is calculated, it is compared to toxicologically based levels leading to adverse health effects. This activity, toxicity assessment, evaluates the available toxicological database compiled for each site-related chemical of concern.

Risk characterization integrates the existing site conditions, exposure pathways and receptors, and chemical toxicity data. This final step characterizes the potential for adverse effects on human health of existing site conditions. Both carcinogenic and non-carcinogenic human health impacts are detailed. The uncertainty in risk characterization is also detailed.

6.2 SITE BACKGROUND AND ENVIRONMENTAL SETTING

The land use and environmental setting of a site will, to a large degree, determine the amount of potential risk to human health posed by site conditions. Land use determines the extent to which potential receptors could contact impacted media (air, water, soil). Isolated sites, with minimal access, intuitively pose less of a potential risk than sites accessible to large numbers of people. The Accurate Die Casting facility falls between these two extremes; it is in a residential/commercial area close to a population center, but access to the site is presently restricted by fences and guards.

A site's environmental settlng determines the relative importance of transport of chemicals through the various media. At the Accurate Die Casting facility, the groundwater is the medium most impacted and with the highest potential for off-site migration. The overburden aquifer and the deeper bedrock aquifer underlying the facility exhibit concentrations of TCE in excess of NYSDOH drinking water standards. The groundwater moves northward, and the overburden aquifer discharges to Bishop Brook. As stated in Section 4.3, we assume that the bedrock aquifer discharges to Bishop Brook as well.

Bishop Brook flows westerly into its confluence with Limestone Creek, some 1200m downstream. Limestone Creek is a tributary to Chittenango Creek, which flows into Oneida Lake. There are no water users along Bishop Brook; no known public, private or agricultural withdrawals are made. Bishop Brook is, however, used for casual water contact recreation. Upstream of the Accurate Die Casting facility, the brook borders a neighborhood park. There is evidence of walking trails to and along the brook from this park; a swimming hole is located approximately 500m downstream of the former industrial facility.

The second medium with elevated TCE concentrations was site soils, particularly soils at depths between 25 and 30 feet (8-10m), as measured in borings within 200m of the free product recovery well (MW-3-SS). Soils at this depth are unlikely to pose a risk to human health unless intrusive activities are underway. The concentrations (maximum 840 ppb) indicate that residual and vapor phase TCE exists in the soil adjacent to this monitoring well, however, and may continue to supply TCE to the groundwater system.

In the risk assessment procedure, the land use, environmental setting, and description of contaminated media are integrated into an evaluation of current and future pathways by which exposure to site-related chemicals may occur. The Accurate Die Casting facility is in a mixed residential/commercial area. Discussions of rezoning the property from commercial to residential have already begun (Mayor Loosman, Personal Communication, September 25, 1992). Thus, future residential use of this industrial property is considered an appropriate scenario for inclusion in this baseline risk assessment.

6.3 SUMMARY OF SITE RESULTS

The sampling plan designed to further describe environmental conditions at the Accurate Die Casting facility has been described in Chapter 2. Groundwater, soil, surface water, stream sediment, and sludge samples were obtained during the summer of 1992 to address each of the five objectives of this investigation.

As detailed earlier, each sample was analyzed by Nytest Environmental, Inc., a New York State-certified laboratory in the NYSDEC Analytical Services Protocol program. Each analytical result was subjected to rigorous data validation, that is, examined for compliance with the criteria specified by NYSDEC and USEPA for technically defensible data. Data validation was performed by Roy F. Weston Analytics Division. Technically acceptable data underwent additional screening before inclusion in the calculations of site-related risk. Screening was based on comparison to background (off site) concentrations, comparison to applicable standards, and existence of quantitative toxicological information.

Table 6-1 summarizes the screening of groundwater data for inclusion into quantitative risk assessment. Similarly, Table 6-2 presents the Bishop Brook data, both for surface water and sediment. TCE is the organic compound detected at highest concentration in all media; total chromium in groundwater is the inorganic compound of greatest potential concern. Table 6-3 summarizes the atmospheric monitoring data included in the quantitative risk assessment.

TABLE 6-1

DATA SCREENING FOR INCLUSION IN QUANTITATIVE RISK ASSESSMENT: GROUNDWATER PATHWAY

Compound	Concentration Range (µg/l)	ARAR(1) (µg/l)	Type of Health Effect
Trichloroethene (TCE)	ND-340,000	5	Carcinogenic
1,2-dichloroethene	ND-9	5	Carcinogenic
Tetrachloroethene (PCE)	ND-4	5	Carcinogenic
4-methyl, 2-pentanone	ND-18,000	50	Data inadequate for quantitative risk assessment (dropped)
2-hexanone	ND-26,000	50	Data inadequate for quantitative risk assessment (dropped)
1,1,2,2-tetrachloroethane	ND-6,600	5	Carcinogenic
Toluene	ND-3,000	50	Non-carcinogenic (chronic)
Chromium (total)	ND-430	50	Non-carcinogenic (chronic)
Antimony	ND-75.3	3G (2)	Non-carcinogenic (chronic)
Iron	ND-36,000	300 (3)	No data (dropped)
Manganese	10,700-100,000	300 (3)	Non-carcinogenic (chronic)
Magnesium	5.3-1420	35,000G	No data (dropped)

(1) ARAR from 10 NYCRR Part 5; NYSDOH drinking water supply regulations, unless noted otherwise.
(2) G denotes guidance value, not standard.
(3) Standard from 6 NYCRR 703.5(a)(3): NYSDEC groundwater regulations. Iron plus manganese limit 500 µg/l.

ND = Not detected.

TABLE 6-2

DATA SCREENING FOR INCLUSION IN QUANTITATIVE RISK ASSESSMENT: SURFACE WATER PATHWAY

Compound	Concentration Range (µg/l)	ARAR*	Type of Health Effect
Trichloroethene (TCE)	ND-3 (surface water) 67 (seep)	11G	Carcinogenic

*There are no surface water standards for TCE, only guidance values. Guidance value is 3 µg/l for Classes A,AA, and A,AA-Special. Guidance value is 11 µg/l for all other classes of surface water.

Bishop Brook is Class C (T-S).

TABLE 6-3

DATA SCREENING FOR INCLUSION IN QUANTITATIVE RISK ASSESSMENT: INHALATION PATHWAY

Compound	Concentration Range (µg/m^3)*	ARAR (µg/m^3)**	Type of Health Effect
Trichloroethene	0.28-0.32	0.45	Carcinogenic
Tetrachloroethene	0.12-0.14	0.075	Carcinogenic

*Reference: Summary Report, Phase II Environmental Assessment and Remediation Efforts at the Accurate Die Casting Facility, Fayetteville, NY. Stearns & Wheler, September 1990.

**Guidance value for long-term exposure from NYSDEC Draft Air Guide 1 (1991).

6.4 SELECTION OF EXPOSURE PATHWAYS

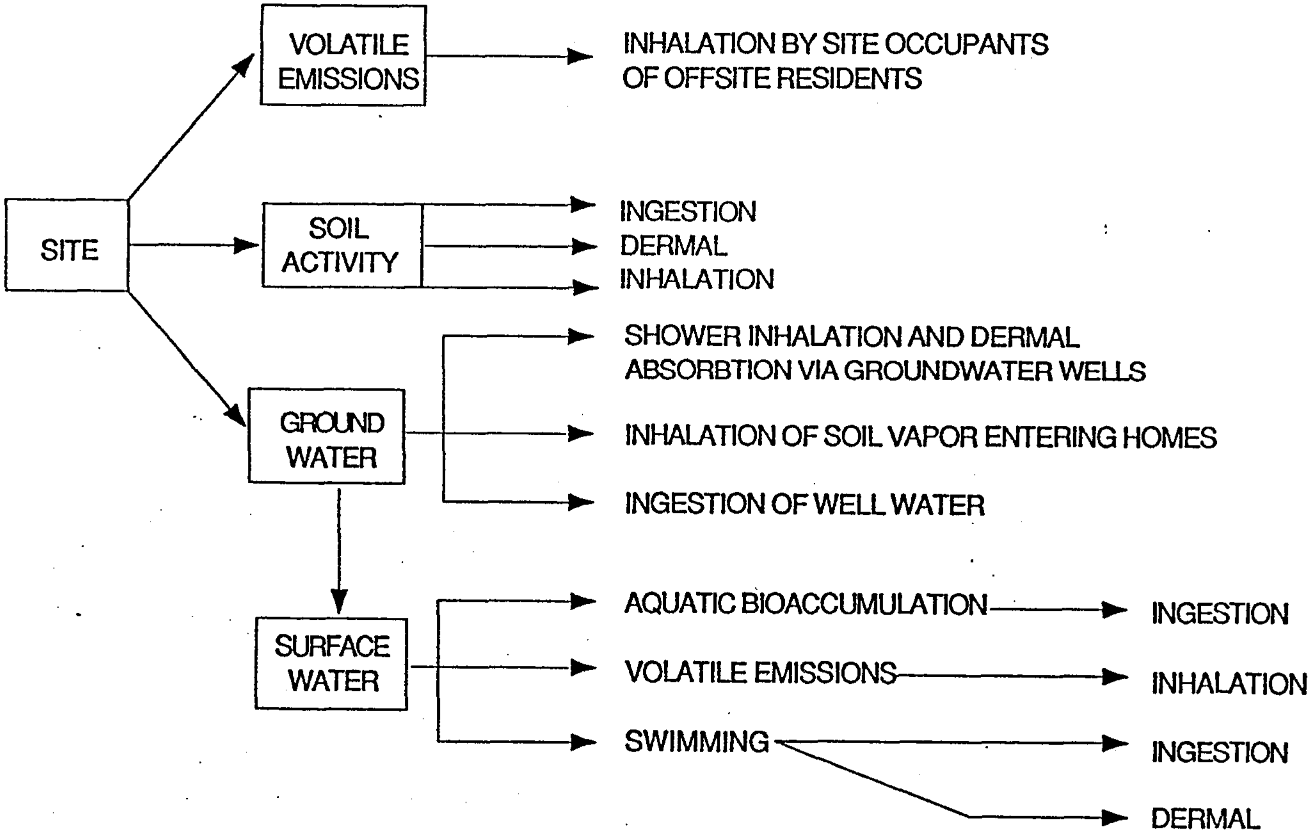
For any site subject to chemical releases, a range of exposure pathways is possible (Figure 6-1). The pathways that are feasible, however, are a subset of this entire range. The site's environmental setting and land use, coupled with the nature and extent of chemical release, determine feasible exposure routes. In this section, the rationale for selection of exposure pathways for both current and future land use conditions at Accurate Die Casting is discussed.

Under current land use conditions, the potential for exposure to site-related chemicals is minimal. The impacted groundwater is not currently used for public or private supply. Soils with elevated TCE are well below the surface, and incidental contact is not probable. Any remedial activities conducted on site will require contractors trained per requirements of OSHA 29 CFR 1910.120. These personnel are required to have training, personal protective equipment, and medical surveillance. Consequently, exposure of remedial contractors was not included in this baseline risk assessment.

The one feasible complete pathway of exposure under current conditions is transport of site-related chemicals to Bishop Brook. Data collected at the seep confirm that TCE has migrated with groundwater to the face of the ravine. Additional indirect evidence that the TCE concentrations in the seep reflect transport from the area adjacent to the building is provided by the consistency in measured concentrations in the seep (Table 4-2, Historical Review of TCE Concentrations).

The impacted seep has been covered by rocks and gravel-filled gabions as an interim remedial measure, thus greatly restricting any potential for direct contact. The seep flows into Bishop Brook and the emergent groundwater is diluted with stream water, then transported downstream. The potential for human exposure exists, as the stream is used for water contact recreation on an informal basis. This pathway is considered complete and is carried through quantitative risk assessment. The ultimate handling of the seep, in terms of remediation or other action, will be evaluated in the Feasibility Study portion of this report.

The degree to which TCE and its associated breakdown products might accumulate in the aquatic sediments was evaluated. The results (Table 4-4) indicate that stream sediments are not accumulating TCE or other compounds to any degree. Total organic carbon (TOC) content of the stream sediments was analyzed to determine the extent to which any organic compounds accumulating in sediments would be biologically available. As only trace concentrations of TCE



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 10/92 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 6–1
POTENTIAL EXPOSURE PATHWAYS

were detected, no further analysis of biological availability was performed. Exposure pathways associated with the sediments were consequently not included in quantitative risk assessment.

Under potential future land use scenarios, additional complete exposure pathways are possible. If residential development occurs, connection to the public water supply system is virtually certain. Onondaga County Water Authority supplied water to the industrial facility in the past; connections are in place. However, review of the Village of Fayetteville's zoning ordinances revealed that there are no regulations prohibiting installation of a private well. Consequently, a future complete exposure pathway is utilization of a private well. This pathway is included for completeness, although it is not considered likely.

A second complete exposure pathway for future residential use is inhalation of TCE, a volatile organic compound. The remaining TCE in the groundwater, as well as the soil-held residual, can volatilize through the soil vapor. Calculations of exposure by this pathway are presented.

Final exposure pathways under both current and future land uses are summarized in Table 6-4. Calculations of the amount of potential exposure to site-related chemicals from these three pathways are detailed in the next section.

6.5 EXPOSURE ASSESSMENT

A. **Water Contact Recreation in Bishop Brook (Current Conditions).** The groundwater seep transports TCE from the release site near the building into Bishop Brook. Three rounds of monitoring data indicate that the concentration of TCE in the seep ranges from 67-78 µg/l (ppb). The resulting concentration in Bishop Brook varies with the relative flow contributions of the seep and the brook, as described in Equation 6-1.

$$C_m\,(\text{TCE}) = \frac{(C_s \times Q_s) + (C_u \times Q_u)}{Q_s + Q_u} \qquad \text{(Equation 6-1)}$$

where:

C_m (TCE) = Concentration TCE after mixing
C_s = Concentration in seep
Q_s = Flow of seep
C_u = Concentration upstream
Q_u = Flow upstream

TABLE 6-4

SUMMARY OF EXPOSURE PATHWAYS

Source	Pathway	Receptor
Current Land Use		
Groundwater	Seep to Bishop Brook	Water contact recreation in brook
Future Land Use		
Groundwater	Transport downgradient	Residential users with private wells (ingestion)
Groundwater and soils	Volatilization through soil vapor	Site residents (inhalation)

Low flow conditions in the stream would maximize final TCE concentrations after mixing of the seep and the brook. Unfortunately, Bishop Brook is an ungauged stream; there is no flow record available to predict critical low flow conditions. The May 1992 sampling data indicate an approximate dilution ratio of 22:1 (seep TCE concentration 67 ppb, in-stream concentration after mixing 3 ppb). Based on visual observation of the range in water surface elevation (such as bank erosion and vegetation), the May sampling was conducted during a low-moderate flow regime. A critical dilution might be in the range of 7-10:1. At a 7:1 dilution, the TCE concentration after mixing could be as high as 10 ppb. The concentration will be utilized to calculate exposure during water contact recreation. As low flow conditions often coincide with the peak swimming season (warm, dry weather), this assumption is considered appropriately conservative.

For water contact recreation, the potential exposure pathways include dermal contact, ingestion, and inhalation. USEPA has tabulated standard default assumptions for these pathways.

1. **Dermal Contact.** The exposure by dermal contact is calculated as follows:

$$DEX = t_e \text{ x } AV \text{ x } C \text{ x } PC \text{ x } F \text{ x } 1 \text{ liter}/1000 \text{ cm}^3 \div BW \div 2.56 \text{ x } 10^4 \text{ days/lifetime} \qquad \text{(Equation 6-2)}$$

where:

DEX = Estimated dermal exposure (mg/kg/day)
t_e = Duration of exposure (hours/event)
AV = Skin surface area available for contact (cm^2)
C = Contaminant concentration in water (mg/liter)
PC = Dermal permeability constant for the subject contaminant (cm/hr)
F = Frequency of exposure events per lifetime
BW = Average child body weight (20 kg)

The term 1 liter/1000 cm^3 is a volumetric conversion constant for water.

Parameter values are assigned as follows:

t_e (duration of exposure) = 2.6 hr/event

AV (skin surface area) = Assume children 9400 cm^2

C = TCE concentration = 0.010 mg/l

PC - TCE permeability (cm/hr). Unknown. Default assumption is that TCE is carried through the skin as a solute in water. Use permeability of water 8.00E-04.

F = 100 events per lifetime (10 times/year, ages 6-15)

BW = 20 kg

Therefore:

DEX = (2.6 hrs/event) x (9400 cm^2) x (0.010 mg/l) x (8.00E-04 cm/hr) x (100 events/lifetime) x (1l/1000 cm^3) ÷ 20 kg ÷ 2.56 x 10^4 days/lifetime

DEX = 3.8 x 10^{-8} mg/kg/day

2. **Ingestion.** The amount of water and associated TCE from incidental ingestion from swimming in Bishop Brook is calculated in this section. Again, standard default equations and parameter values are used (Equation 6-3):

IngEx = t_e x C x F X G x 1l/1000 ml ÷ BW ÷ 2.56 x 10^{-4} days/lifetime (Equation 6-3)

where:

IngEx = Estimated ingestion exposure (mg/kg/day)
t_e = Duration of exposure (hrs/event)
C = Conc TCE in stream water (mg/l)
F = Frequency of exposure events, per lifetime
G = Ingestion rate (ml/hr)
BW = Body weight (kg)

Parameter values are assigned as follows:

t_e (duration of exposure) = 2.6 hrs/event
C = TCE concentration (0.010 mg/l)
F = 100 events/lifetime
G = 50 ml/hr
BW = 20 kg

Therefore:

IngEx = (2.6 hrs/event) x (0.010 mg/l) x (100 events/lifetime) x (50 ml/hr) x (1l/1000 ml) ÷ 20 kg ÷ 2.56 x 10^4 days/lifetime

IngEx = 2.5 x 10^{-7} mg/kg/day

3. **Inhalation Exposure.** Inhalation exposure to swimmers and casual users of Bishop Brook would be most reliably calculated using ambient air concentrations above the water

body. These data are not available, as atmospheric exposure was not considered critical for incorporation into this investigation. An alternative approach is to model the transport of TCE into the air using a "box model" approach. As the concentration of TCE in the stream water was minimal (for comparison, the OSHA Permissible Exposure Limit for inhalation of TCE is 50 ppm, 270 mg/m^3), this pathway was dropped from further quantitative analysis.

B. **Ingestion of Impacted Groundwater (Future Conditions).** As described above, future residential development will, in all probability, utilize public water supply purveyed by Onondaga County Water Authority. This pathway, ingestion of impacted groundwater as a residential supply, is included for completeness only.

The amount of water ingested by residents and other parameters needed to calculate exposure by this route is detailed in USEPA Guidance Documents (Risk Assessment Guidance for Superfund, USEPA 1989, Modified Default Parameters, USEPA 1991). Exposure is calculated as follows:

$$\text{Intake (mg/kg/day)} = \frac{C \times IR \times EI \times ED}{BW \times AT} \qquad \text{(Equation 6-4)}$$

where:

C = Estimated concentration TCE in residential well, mg/l
IR = Ingestion rate of water, 2l/day
EF = Exposure frequency, 350 days/yr
ED = Exposure duration, 30-year
BW = Body weight, 70 kg
AT = Averaging time (days in lifetime = 2.56 x 10^4)

To predict future exposure, it is necessary to select representative groundwater quality data that are realistic yet appropriately conservative. Monitoring Well 9 data have been selected to estimate groundwater quality in a potential private well. TCE concentrations in other wells are higher, but it is considered unlikely that private residential wells would be installed adjacent to the industrial facility. Monitoring Well 9 is on the eastern side of the property, close to the existing residential development.

For a residential well in the region of Monitoring Well 9, the TCE concentration is estimated between 0.050-0.120 mg/l, based on an estimate of plume morphometry and magnitude. Using the upper concentration, TCE exposure from ingestion of water from a monitoring well installed in this region is as follows:

$$\text{Intake} = \frac{(0.120 \text{ mg/l}) \times (2\text{l/day}) \times (350 \text{ day/yr}) \times (30 \text{ yr})}{(70 \text{ kg}) \times (2.56 \times 10^4 \text{ days})}$$

$$\text{Intake} = 1.41 \times 10^{-3} \text{ mg/kg/day}$$

The data from MW-9 indicate inorganic exceedances of Class GA groundwater standards. The metals chromium, iron, magnesium, antimony, and manganese were detected at concentrations above standards. Exposure to these metals was calculated as well. The model differs in that the health impacts are averaged over the exposure time (30 years) rather than the lifetime (70 years), as is appropriate for calculating chronic rather than carcinogenic effects.

Calculations were therefore made as follows:

$$\text{Intake} = \frac{(\text{Concentration of inorganic metals, mg/l}) \times (2\text{l/day}) \times (350 \text{ days/yr}) \times (30 \text{ yr})}{(70 \text{ kg}) \times (1.1 \times 10^4 \text{ days})}$$

For antimony (.075 mg/l), intake = 2.05×10^{-3} mg/kg/day
For chromium (.430 mg/l), intake = 0.012 mg/kg/day
For iron (36 mg/l), intake = 0.982 mg/kg/day
For magnesium (100 mg/l), intake = 2.73 mg/kg/day
For manganese (1.42 mg/l), intake = 0.039 mg/kg/day

The potential health affects of ingestion of these amounts of metals are calculated in the toxicity assessment.

C. **Inhalation of Volatile Organics by Site Occupants (Future).** One exposure pathway that could potentially be complete in the future is inhalation of organic vapors from the TCE release. If the site is occupied in the future as an industrial, commercial, and/or residential complex, exposure could occur via this pathway.

Ambient air monitoring was conducted once on this site, in February 1990. TCE and tetrachloroethene (PCE) were measured near the site boundaries. Atmospheric concentrations of these chemicals were low; consequently, additional resources were not committed in this remedial investigation towards refining estimates of atmospheric migration of chemicals. The exposure assessment for inhalation will utilize measured values for TCE and PCE in air.

Exposure to receptors via inhalation is calculated as follows:

$$\text{Intake (mg/kg/day)} = \frac{CA_i \times IR \times ET \times EF \times ED}{BW \times AT} \qquad \text{(Equation 6-5)}$$

where:

CA = Atmospheric concentration of chemical i (TCE = 3.2×10^{-4} mg/m^3, PCE = 1.4×10^{-4} mg/m^3)
IR = Inhalation rate (m^3/hr), default 20m^3/day
ET = Exposure time (hrs/day); 8 hrs/day industrial/commercial, 24 hrs/day residential
EF = Exposure frequency (days/yr); 250 days/yr industrial/commercial, 350 days/yr residential
ED = Exposure duration, years; 25 years industrial/commercial, 30 years residential
BW = Body weight, 70 kg
AT = Averaging time (days), 2.56×10^4 days/lifetime

Therefore, inhalation of TCE and PCE is calculated as:

$$\text{Intake} = \frac{(3.2 \times 10^{-4}\ \text{mg/m}^3) \times (20\ \text{m}^3/\text{day}) \times (8 \text{ or } 24\ \text{hrs/day}) \times (250 \text{ or } 350\ \text{days/yr}) \times (25 \text{ or } 30\ \text{yrs})}{70\ \text{kg} \times 2.56 \times 10^4\ \text{days}}$$

= 1.786×10^{-4} mg/kg/day (TCE, industrial)
= 9.0×10^{-4} mg/kg/day (TCE, residential)
= 8.0×10^{-5} mg/kg/day (PCE, industrial)
= 3.9×10^{-4} mg/kg/day (PCE, residential)

Potential human health impacts of exposure to these amounts of TCE and PCE are presented in the next section, Toxicity Assessment. The potential exposure to receptors under both current and future land use scenarios is summarized in Table 6-5.

6.6 TOXICITY ASSESSMENT

The toxicity assessment determines the extent to which adverse health impacts could arise from the calculated exposure to site-related chemicals. The USEPA's Integrated Risk Information System (IRIS) provides an on-line database of health impacts of a large number of chemicals and was utilized as a reference in this task.

Two types of health impacts from exposure to chemicals are possible: subchronic and chronic toxicity is the first type, and carcinogenicity is the second. Subchronic and chronic toxic effects are health impacts that are exerted slowly over the same time period as exposure occurs. A "threshold" model is used to conceptualize these effects, that is, there is a dose below which no adverse effects will occur. Carcinogenic effects are molecular events that evoke changes on the

TABLE 6-5

SUMMARY OF EXPOSURE TO SITE-RELATED CHEMICALS

Compound	Pathway	Exposure (mg/kg/day)
Pathway: Water contact recreation in Bishop Brook (dermal ingestion of TCE) - Current land use conditions.		
TCE	Dermal absorption	1.1E-08
	Ingestion	7.3E-08
Pathway: Private water supply (ingestion TCE, inorganics) - Future land use conditions.		
TCE	Ingestion	1.4E-03
Chromium		1.2E-02
Antimony		2.1E-03
Iron		9.8E-01
Manganese		3.9E-02
Pathway: Future redevelopment, inhalation - Residential and industrial/commercial use of site		
TCE	Inhalation	1.8E-04
PCE	Industrial/commercial	8.0E-05
TCE	Inhalation	9.0E-04
PCE	Residential	3.9E-04

cellular level that can lead to uncontrolled cellular proliferation and eventually to the disease cancer. Exposure can lead to clinical effects later in life, in contrast to the subchronic and chronic effects where effects occur over the same time period as exposure. Carcinogenesis is conceptualized as a "non-threshold" model , because there is no exposure that produces a zero chance of a carcinogenic response.

Toxicity assessment calculations reflect the differences between the two human health responses. The potential impacts of exposure to non-carcinogenic chemicals are evaluated by comparing the calculated exposure to the published "reference dose" for the chemical of concern. The reference dose (RfD) is the estimated exposure at which no adverse health impacts will occur, even among sensitive subpopulations. Exposure at the reference dose may occur without deleterious effects for a lifetime. Uncertainty in the reference dose may span an order of magnitude.

Operationally, the ratio between calculated exposure and the reference dose is computed. As this ratio approaches unity, the potential for adverse health impacts from site-related chemicals increases.

Carcinogenic effects are calculated by multiplying exposure amounts (mg/kg/day) by a "slope factor" (unit risk per mg/kg/day). The product is thus the unit risk of developing carcinogenic effects from exposure at that amount. The slope factors are published by USEPA and reflect consensus judgments of the agency scientists. Each slope factor is qualified by a "weight of evidence" factor denoting the uncertainty in prediction of human carcinogenicity. Table 6-6 summarizes the toxicity assessment calculations for each pathway identified as feasible for both current and future uses of the Accurate Die Casting facility.

6.7 RISK CHARACTERIZATION

This section represents the final step in the baseline risk assessment. Exposure and toxicity data are integrated into a description of risk to human health posed by the site. Based on the distribution of site-related chemicals and the environmental setting of the Accurate Die Casting facility, three feasible pathways of exposure were identified and quantified. Under current conditions, the one complete exposure pathway is transport of impacted groundwater to Bishop Brook and exposure during water contact recreation. Two additional pathways, ingestion of impacted groundwater and inhalation of impacted air, are feasible if the site is redeveloped and occupied in the future.

TABLE 6-6

TOXICITY ASSESSMENT

	Non-carcinogenic Reference Dose	Carcinogenic	
		Slope Factor	Weight of Evidence*
Pathway: Water contact recreation, Bishop Brook current land use			
Dermal Exposure:			
TCE	None	1.1E-02	B2
Ingestion Exposure:			
TCE	None	1.1E-02	B2
Pathway: Ingestion of impacted groundwater, future land use.			
TCE	None	1.1E-02	B2
Chromium (III)	1E+0	None	NA
Chromium (VI)	5E-03	None	NA
Antimony	4E-04	None	NA
Manganese	1E-01	None	NA
Pathway: Inhalation of site-related chemicals, future land use			
TCE	None	1.7E-02	B2
PCE	None	1.9E-03	B2

*Weight of evidence refers to standard USEPA codes.

A	Known human carcinogen.
B1	Probable human carcinogen. Limited human data available.
B2	Probable human carcinogen. Sufficient evidence in animals exists. Human data inadequate or shows no evidence of carcinogenicity.
C	Possible human carcinogen.
D	Not classified as to human carcinogenicity.
E	Evidence of non-carcinogenicity.

Table 6-7 integrates the calculations of exposure to site-related chemicals with the toxicological database describing their health impacts. The degree to which exposure approaches or exceeds limits of regulatory concern for each chemical and each pathway is calculated. Limits of regulatory concern are defined as follows: for non-carcinogenic compounds, one; for carcinogenic compounds, one additional cancer in a population of 10^5 - 10^6.

Review of Table 6-7 indicates that under current conditions (non-occupied site, restricted access), risk to human health is negligible. The receptor of impacted groundwater, Bishop Brook, provides sufficient dilution with surface water flow to maintain TCE below concentrations of potential concern. Sediment samples obtained from the stream bed indicate that site-related chemicals are not accumulating in this medium. This conclusion is based on Bishop Brook acting as the flow boundary to the deeper bedrock aquifer, as well as to the overburden aquifer (refer to Section 4.3A).

The calculations of risk to human receptors under future land use indicate that utilization of the groundwater for a private supply is inadvisable. Elevated concentrations of both carcinogenic and non-carcinogenic chemicals would create an unacceptable risk to consumers of this groundwater. Additional exposure could result from inhalation of TCE during showering and bathing, thus increasing the risk to an exposed individual. However, this groundwater is unlikely to be utilized as a supply, even in the absence of the TCE release from the Accurate Die Casting facility. Public water is supplied to the site. Elevated concentrations of minerals, particularly iron and manganese, can render the water unpalatable. In addition, the calculations of exposure to inorganic chemicals are based on the "total" (unfiltered) results; well water was turbid and the minerals are present in particulate form. Water with this amount of turbidity is not generally utilized for consumption if high quality alternatives are readily available. Finally, minerals associated with particulate material are not readily biologically available; the absorbed dose is much less than the ingested dose.

Inhalation of volatile organic compounds during site occupancy is a second potentially complete exposure pathway under future land use. Ambient air quality monitoring was conducted in February 1990 (Stearns & Wheler, September 1990). These data were utilized to assess the relative importance of the inhalation pathway. TCE concentrations were below New York State's draft "annual guideline concentrations (AGC)." Calculated risks from long-term exposure at the measured concentrations were in the 10^{-5} to 10^{-6} range. PCE concentrations measured on site exceeded New York's draft AGC. However, risks of long-term exposure to these concentrations were calculated in the 10^{-7} range.

TABLE 6-7

RISK CHARACTERIZATION

Exposure Pathway: Water contact recreation, Bishop Brook.

Chemical	Exposure Route	Exposure Magnitude (mg/kg-d)	Slope Factor (Per Exposure)	Unit Risk
TCE	Dermal	3.8E-08	1.1E-02	4.2E-10
	Ingestion	2.5E-07	1.1E-02	2.8E-09

SUMMED RISK PER PATHWAY 3.2E-09
(carcinogenic)

Exposure Pathway: Ingestion of private water supply if site redeveloped.

		Carcinogenic		Non-carcinogenic	
Chemical	Exposure Magnitude (mg/kg-d)	Slope Factor (Per Exposure)	Risk	Reference Dose (mg/kg-d)	Risk
TCE	1.4E-03	1.1E-02	1.6E-05	NA	NA
Cr	1.2E-02	NA	NA	6E-03	2
Sb	2E-03	NA	NA	4E-04	5
Mn	3.9E-02	NA	NA	1E-01	3.9E-01

SUMMED RISK PER PATHWAY .... 1.6E-05 (carcinogenic) 7.4 (non-carcinogenic)

Exposure Pathway: Inhalation of volatile organics if site redeveloped.

	Exposure Magnitude (mg/kg/day)			Risk	
Chemical	Residential	Commercial/ Industrial	Slope Factor (Per Exposure)	Residential	Commercial/ Industrial
TCE	9E-04	1.8E-04	1.7E-02	1.5E-05	3E-06
PCE	3.9E-04	8E-05	1.9E-03	7.4E-07	1.5E-07

SUMMED RISK PER PATHWAY .... Residential: 1.6E-05
Commercial/Industrial: 3.2E-06

In summary, the only pathway of exposure resulting in unacceptable risks to human health is utilization of the impacted groundwater resource as a water supply. Any additional remedial actions considered for this site may be framed in terms of their efficacy in reducing this risk. There is no evidence from the habitat survey or the sediment sampling conducted in Bishop Brook that other components of the abiotic and biotic environments are adversely impacted by site conditions.

6.8 DISCUSSION OF UNCERTAINTIES

To complete a baseline risk assessment, a number of assumptions must be made. The preceding narrative sections, Discussion of Pathways, Exposure Assessment, and Toxicity Assessment, detail the series of assumptions necessary to predict future land use and assign parameter values to models. In this section, impacts of uncertainties in model predictions are tabulated (Table 6-8).

Overall, a number of uncertainties exist in the quantitative assessment of risk to human health associated with the site. Conservative assumptions have been made throughout. Changing certain parameter values has a negligible effect on interpretation of risk associated with the site. For example, a critical assumption needed to assess the current impact on water quality in Bishop Brook is the ratio between the volumes of the groundwater seep and the stream. A conservative value (1:7 dilution) was selected. If, under extreme flow conditions, a dilution of 1:3 is exhibited, the order of magnitude of risk to human receptors is unaffected.

Of greater potential impact on the conclusions is uncertainty in the site's conceptual model. TCE was detected in the mg/l range in the bedrock aquifer. Risk calculations have assumed that this deeper aquifer discharges to Bishop Brook. If this conceptual model is incomplete, then additional receptors may be present. The available data for this site are not sufficient to estimate the direction and extent of any migration through deep bedrock.

The final predictions of risk are quite sensitive to the parameter values assigned in the exposure assessment. Because of this sensitivity, and in order to standardize risk assessments between sites, USEPA has assigned standard "default" parameter values for exposure assessment models. The default parameter values (e.g., body weight, amount of water ingested each day) are selected to be realistic and conservative. Additional safety factors are incorporated into the reference dose and the slope factor to protect sensitive subpopulations.

TABLE 6-8

EFFECTS OF UNCERTAINTY IN ASSUMPTIONS ON PREDICTIONS OF RISK

	Effect on Exposure		
Assumption	Potential Magnitude of Over-estimation	Potential Magnitude of Under-estimation	Potential Magnitude of Over or Under-Estimation
ENVIRONMENTAL AND SAMPLING ANALYSIS:			
1. Groundwater data represent aquifer conditions.			Moderate
2. Lateral extent of plume is well defined.		Low	
3. Ambient air monitoring results are representative of long-term average.			Moderate
4. Stream sampling events conducted during representative flow regimes.		Low	
FATE AND TRANSPORT (CONCEPTUAL MODEL OF SITE):			
1. Bishop Brook is flow boundary.			Unknown
EXPOSURE PARAMETER ESTIMATIONS:			
1. Default parameters are reasonable.			Moderate

Additional uncertainties are introduced when multiple pathways of exposure exist. For example, any future site residents could be exposed to Bishop Brook during water contact recreation, could inhale site-related volatile organics, both in ambient air and during showering and could ingest impacted groundwater. Remedial actions can be evaluated in terms of how well risk to this "most exposed individual" is reduced.

CHAPTER 7

ADDENDUM TO REMEDIAL INVESTIGATION REPORT

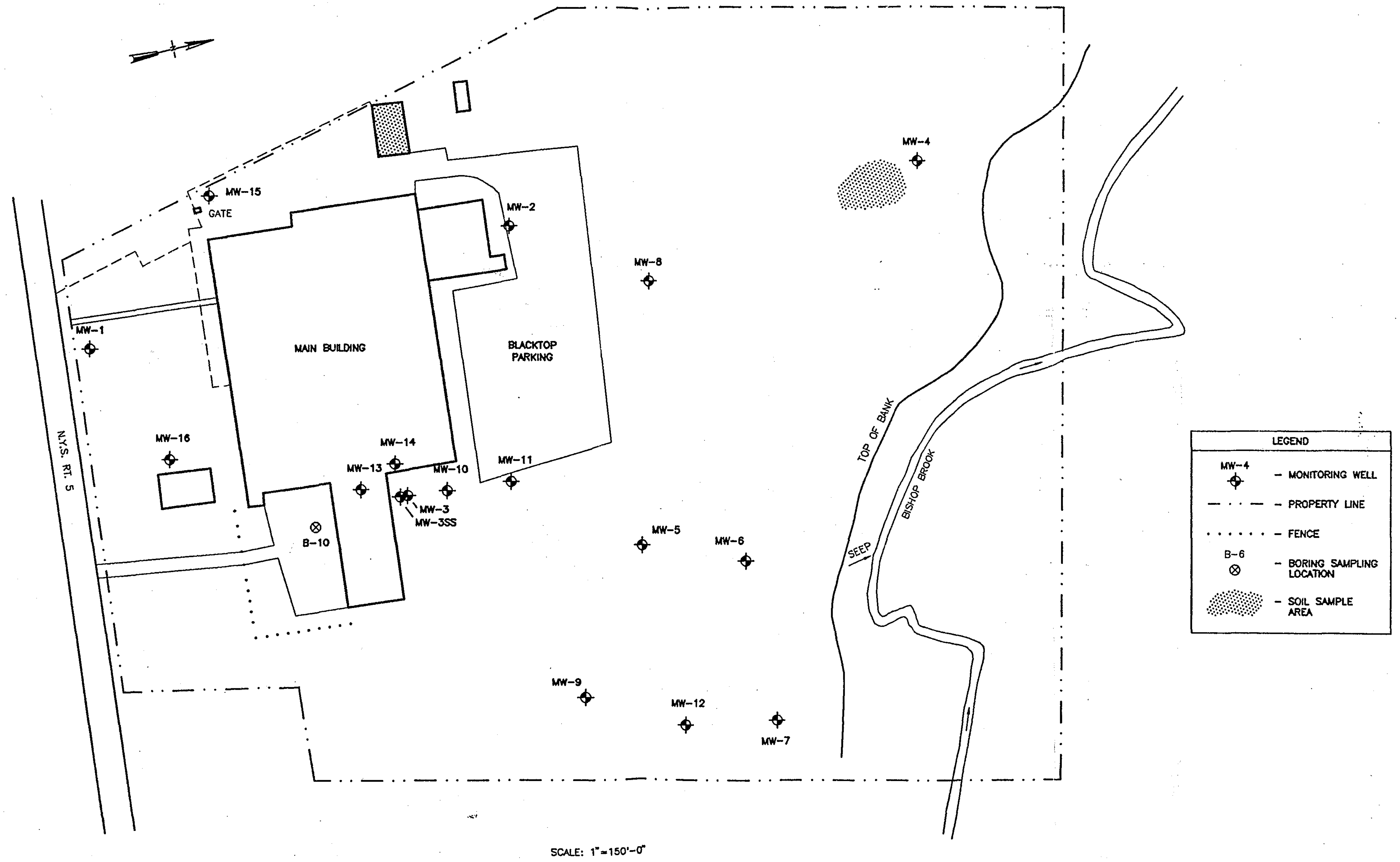
7.1 INTRODUCTION

After completion of the January 1993 draft of the Remedial Investigation Report at the Accurate Die Casting facility and review by NYSDEC, it was determined that additional field work was required. Previous chapters in this report have been updated to include responses to NYSDEC comments on the January 1993 draft report. This chapter discusses the results of the additional work that was performed, which included an evaluation of groundwater flow directions in local bedrock, bedrock groundwater quality to the south, and the analytical results of soil and groundwater sampling. All NYSDEC comments and our responses are not necessarily included in this report revision. The May 7, 1993 response letter to NYSDEC that addresses each comment is attached as Appendix G.

7.2 DRILLING METHOD

Monitoring Wells MW-15 and MW-16 were installed August 2-4, 1993 (Figure 7-1). The wells are screened in bedrock and were installed to assist in determining groundwater flow directions and potential contamination of the bedrock aquifer. MW-15 was initially advanced using 4.25-inch inside diameter (I.D.) hollow stem augers (HSA) to create a pilot hole for the 6.25-inch HSAs. The augers were advanced to a point 5 feet into the bedrock. Four-inch Schedule 40 black iron casing was then set and grouted in the boring to prevent migration of overburden groundwater to the bedrock aquifer. The grout was allowed to set for 24 hours. After that time, drilling continued using a rotary bit. Drilling halted at a point approximately 15 feet below the bedrock surface. Because of the potential presence of TCE, a stainless steel screen and riser were installed in the boring. Well materials included a fine sand pack from the base of the boring to a point 2 feet above the screen. This was followed by 2 feet of bentonite pellets, and then several feet of grout. The protective cover was then cemented into place. Boring logs and illustrations of well construction can be found in Appendix A.

Monitoring Well MW-16 was advanced and constructed in the same manner as MW-15. However, after setting the 4-inch black iron casing in grout and drilling the grout from the center of



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 7-1
SITE MAP

the pipe casing, the bedrock was cored using an HX rock coring device. The coring device was advanced 10 feet into bedrock in an attempt to get a continuous core sample. Due to the friable nature of the bedrock, continuous samples were not possible. After coring, the boring was enlarged with a roller bit. The stainless steel screen and riser and well materials were installed in a similar manner to MW-15.

During drilling, overburden soil samples were recovered at standard intervals using a split-spoon sampling device. The physical characteristics of each sample were recorded by a hydrogeologist. In addition, each sample was screened with a photoionization detector (PID) to determine the presence of volatile organic compounds. No volatilization was noted during drilling.

To prevent potential cross contamination between well locations, all downhole equipment was decontaminated between each location. Wells were developed to remove fine-grained materials introduced into the wells during drilling.

7.3 GROUNDWATER AND SOIL SAMPLING

A. **Groundwater Sampling.** Groundwater samples were collected from all on-site monitoring wells on August 10 and 11, 1993. Before sampling, groundwater depths were measured and three well volumes were purged from each well. Purging the wells ensured that the water sampled was representative of formation water, not stagnant casing storage water. The water was purged using dedicated bailers to reduce the potential of cross contamination. Applicable ASP QA/QC samples were also collected. Samples were then collected and analyzed for volatile organic compounds using USEPA Method 8080.

B. **Soil Sampling.** To evaluate the potential presence of residual PCBs or petroleum-related compounds, 18 soil samples were collected near the outfall located in the northwestern portion of the property on July 28, 1993. Each sample was collected from the surface soils within and adjacent to the 1987 spill area with a decontaminated sampling trowel. These samples were collected at a depth of approximately 0 to 6 inches and designated S-1 to S-18 (there is no sample "S-7" within this sample set). Approximate sample locations are shown on Figure 7-2. Additional soil samples were collected from the old transformer yard to confirm remediation in that area.

After collection, the 18 samples (plus a matrix spike, matrix spike duplicate, and wash blank sample) were placed on ice and submitted to Nytest Environmental, Inc. for polychlorinated

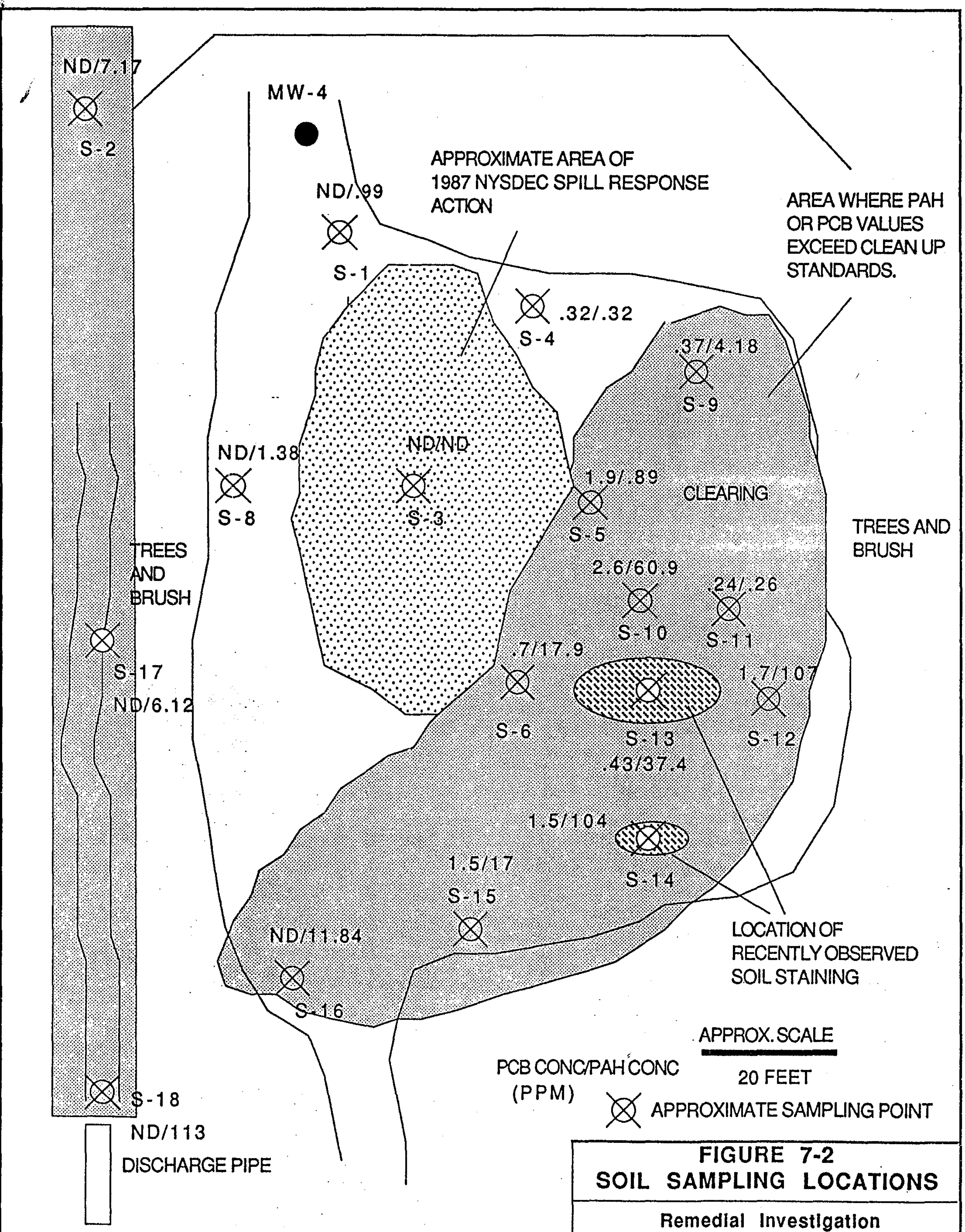


FIGURE 7-2
SOIL SAMPLING LOCATIONS

Remedial Investigation
Accurate Die Casting

Stearns & Wheler
ENVIRONMENTAL ENGINEERS AND SCIENTISTS

NOTE: THERE IS NO SAMPLING POINT S-7

PROJECT NO. 2125

biphenyl (PCB) and polynuclear aromatic hydrocarbon (PAH) analyses. Transformer area samples were analyzed for PCBs only. In addition, NYSDEC representatives collected split samples in the outfall area and analyzed the soils for volatile organic compounds.\

7.4 FINDINGS

A. **Hydrogeology.** Split-spoon sampling confirmed previous interpretations of the local overburden (Appendix A). At each location were sequences of thick, dense, silty, glacial till. Within this matrix were angular clasts of shale, apparently derived from local bedrock. These fragments increase in number near the bedrock overburden interface.

The bedrock encountered at the two well locations consisted of highly fractured and weathered gray-green shales. Due to the fracturing and ease of drilling, it was difficult to determine the location of the bedrock surface. The bedrock surface appears to slope toward the north. This is not indicative of the regional dip of the beds (which is approximately 1 to 2° south-southwest in this area), but of the scarp face adjusted to Bishop Brook. This scarp was developed and modified by fluvial and glacial action, resulting in an irregular scarp face that is generally mimicked by the surface topography adjacent to the brook.

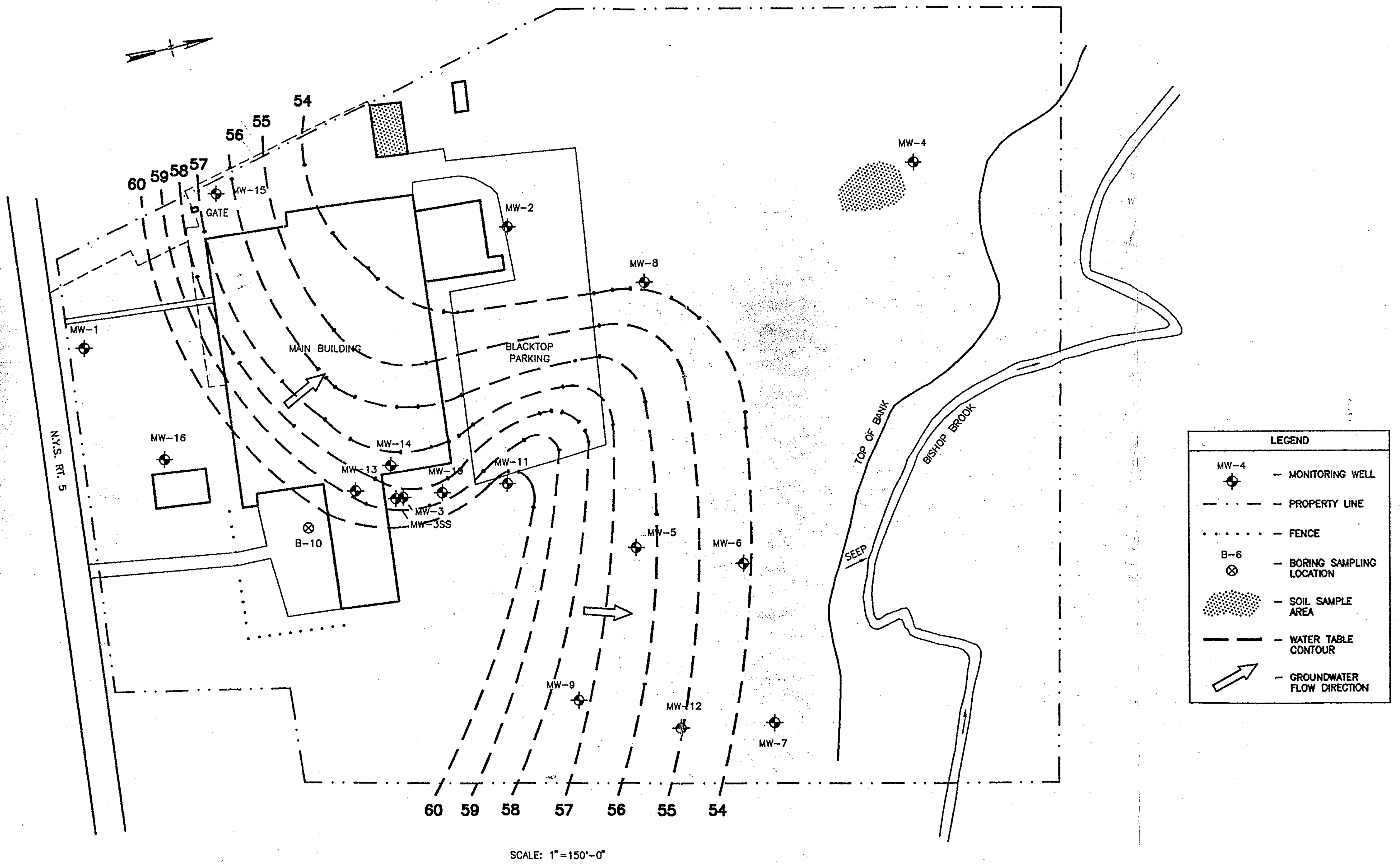
Groundwater elevations of the bedrock aquifer (Table 7-1) were determined after the two additional wells were surveyed and tied into the existing 100-foot datum (Figure 7-1). These elevations indicate that the groundwater flow in the bedrock is generally to the north toward Bishop Brook (Figure 7-3). It should be noted that due to the highly fractured nature of the bedrock at this site, it is extremely difficult to characterize flow and flow directions. If groundwater flow is primarily through enlarged bedding planes or fractures, then flow in the bedrock is highly anisotropic. Therefore, there can be significant changes in hydraulic characteristics within a single bedrock unit over a small distance.

B. **Groundwater Analysis.** Groundwater analysis was completed for all wells at the site (Appendix G). This round of sampling is consistent with previous sampling rounds. Contaminant concentrations can be found on Table 7-2 and contours of trichloroethylene (TCE) concentrations are found on Figure 7-4. Figure 7-4 illustrates the concentration of TCE found in bedrock wells during the most recent round of sampling. Estimated concentrations at or below NYSDEC groundwater standards of 5 parts per billion (ppb) were found in the newly constructed Wells MW-15 and MW-16. Figure 7-5 indicates TCE concentrations in overburden wells at the site.

GROUNDWATER AND BEDROCK SURFACE ELEVATIONS
ACCURATE DIE CASTING
Aug-93
TABLE 7-1

WELL ID	CASING ELEVATIONS	GROUNDWATER ELEVATIONS	BEDROCK SURFACE ELEVATIONS
MW-1	101.11	DRY	76.86
MW-10	99.69	58.75	74.69
MW-11	93.8	60.12	56.3
MW-7	78.34	54.47	52.84
MW-15	98.87	56.61	53.46
MW-16	100.46	63.6	73.87

Based on 100 foot datum

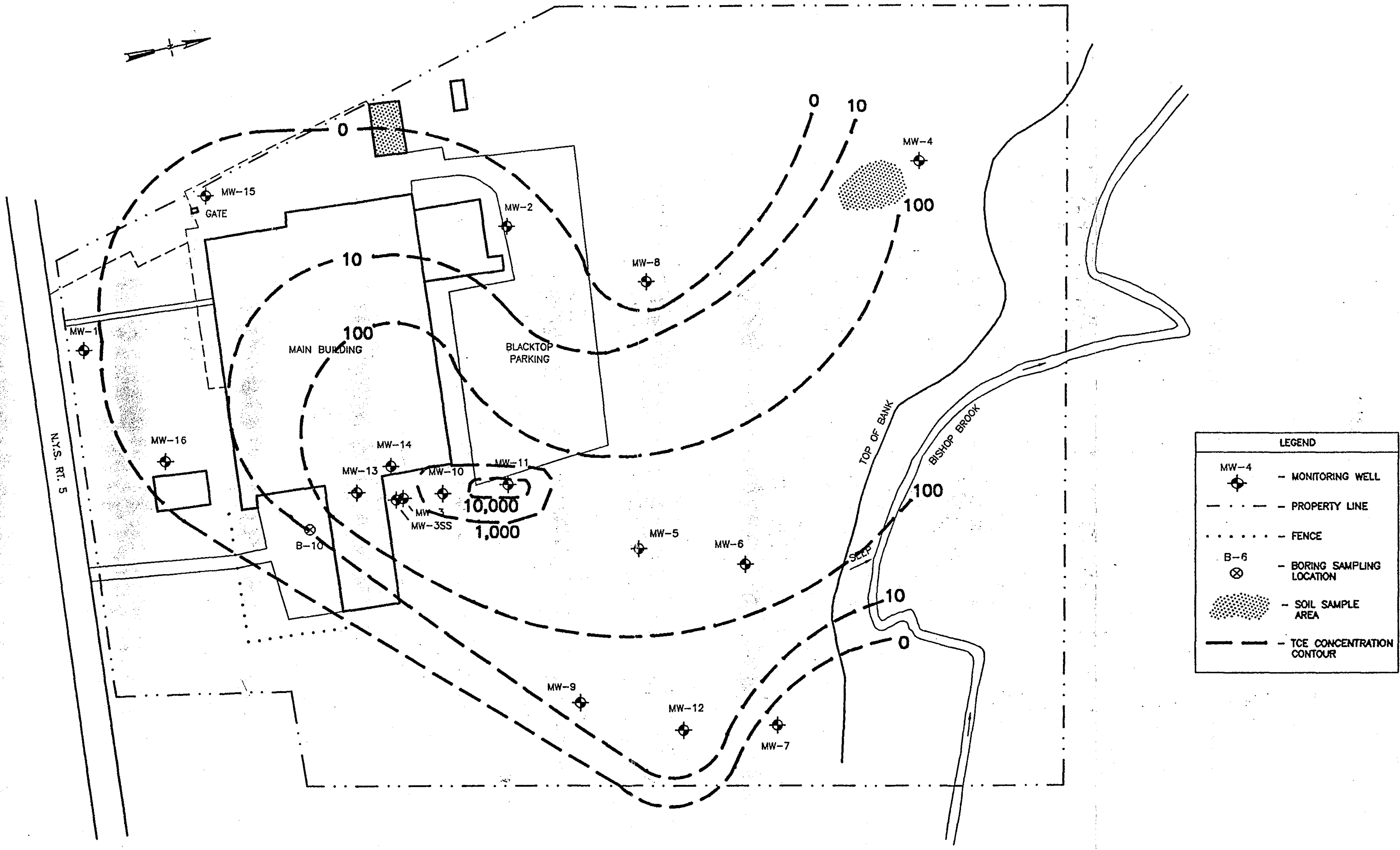


Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 7-3
BEDROCK AQUIFER
GROUNDWATER CONTOURS

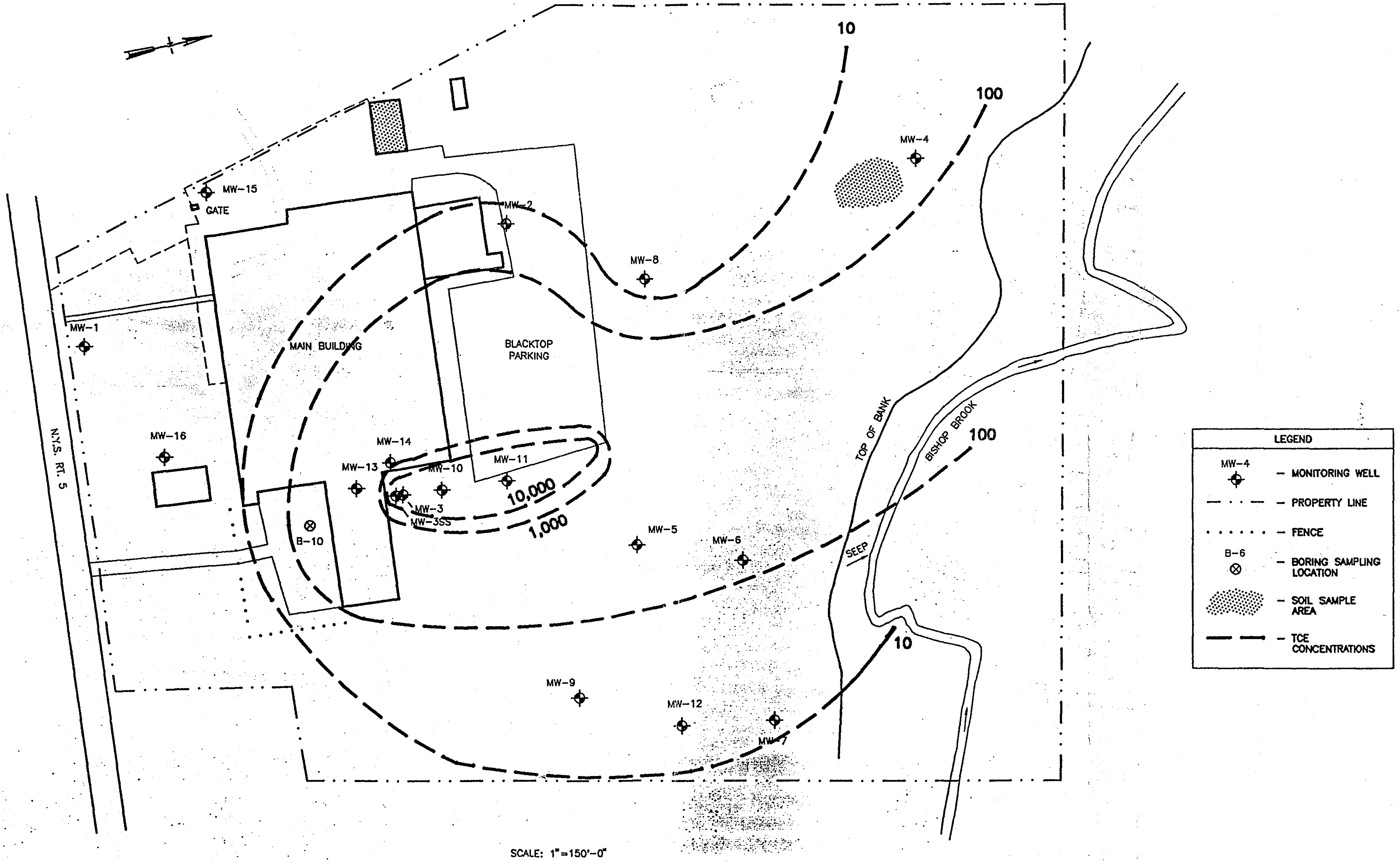


Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 7-4
TCE CONCENTRATION IN BEDROCK AQUIFER
AUGUST 1993



Stearns&Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

DATE: 12/93 JOB No.: 2125

ACCURATE DIE CASTING
FAYETTEVILLE, NEW YORK
SUBSURFACE INVESTIGATION

FIGURE 7-5
TCE CONCENTRATION ON OVERBURDEN AQUIFER AUGUST 1993

NYSDEC ANALYTICAL RESULTS OF SOIL SAMPLES
VOLATILE ORGANIC COMPOUNDS
ACCURATE DIE CASTING
Aug-93
TABLE 7-2

	SAMPLE ID		
Analyte (UG/KG)	S-5	S-13	S-14
Chloromethane	ND	ND	ND
Bromomethane	ND	ND	ND
Vinyl chloride	ND	ND	ND
Chlorethane	ND	ND	ND
Methylene Chloride	52B	ND	ND
Acetone	ND	ND	ND
Carbon disulfide	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND
trans-1,2-Dichloroethene	ND	190000J	19000J
Chloroform	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND
2-Butanone	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Carbontetrachloride	ND	ND	ND
Vinyl acetate	ND	ND	ND
Bromodichloromethane	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND
Trichloroethene	18B	ND	ND
Dibromochloromethane	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND
Benzene	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND
Bromoform	ND	ND	ND
2-Hexanone	ND	ND	ND
4-methyl-2-pentanone	ND	ND	ND
Tetrachloroethene	ND	ND	ND
Toluene	ND	ND	ND
Chlorobenzene	ND	ND	ND
Ethylbenzene	ND	ND	ND
Styrene	ND	ND	ND
Total xylenes	ND	ND	ND
Total chlortoluene	ND	ND	ND
Total Dichlorobenzene	ND	ND	ND

Shaded areas indicate estimated concentrations of analytes

C. **Soils Analysis.** Soil samples were collected and analyzed for PCBs at two areas on site: the former transformer area west of the main facility and the outfall area in the northwestern portion of the property. The outfall area was also analyzed for polynuclear aromatic hydrocarbons (PAHs). Analysis of soil samples in the transformer area indicated no PCBs present in the soil, indicating satisfactory remediation of that area.

Sampling locations in the outfall area are shown on Figure 7-2. Analysis of soil samples in the outfall area indicates the presence of PAHs and PCBs in several of the samples collected during this sampling event. PAH concentrations ranged from non-detectable to 49 mg/kg. PCB concentrations ranged from non-detectable to 2.6 mg/kg.

Detectable levels of PAH analytes were found in all but one of the 18 samples. The PAH sampling results are summarized in Table 7-3. Many of the sample locations exhibiting the higher PAH concentrations were visibly stained and located in areas of stressed vegetation. The exception to the stained soil and stressed vegetation observation is the detection of higher PAH levels in the three samples collected in the ditch running from the outfall pipe to Bishop Brook. Sample S-3 was the only sample with no detectable PAH concentrations. S-3 is located in the approximate center of the area previously remediated (1987 NYSDEC spill response action).

Low levels of PCB (less than 3.0 mg/kg) were detected in 10 of the 18 sample locations. A summary of the PCB analytical data is found in Table 7-4. These 10 sample locations tend to be positioned along the eastern extent of the sample area. The remaining eight samples did not exhibit soil concentrations above instrument detection limits.

NYSDEC split soil samples were taken at the outfall area in the northwestern portion of the site and analyzed for volatile organic compounds. NYSDEC results indicate a 19 mg/kg concentration of trans-1,2-dichloroethene (DCE) at sample location S-14 and a 190 mg/kg concentration of DCE at sample location S-13. Each of these sites is located in areas of recently observed soil staining.

DCE is formed as a breakdown product of several common solvents, including trichloroethylene (TCE), which was used at this site (Howard, 1990). Analysis of groundwater adjacent to this site (MW-4) indicates concentrations of both TCE and DCE. This suggests that the presence of DCE is the result of the dehalogenation of trichloroethylene. The presence of these compounds in this area may be the result of discharge from the outflow pipe adjacent to sample site S-18. Portions of TCE that do not evaporate upon discharge leach rapidly to groundwater. The rapidity of leaching

TABLE 7-3

POLYNUCLEAR AROMATIC HYDROCARBONS
ACCURATE DIE CASTING – OUTFALL SOILS DATA
SAMPLE LOCATION CONCENTRATIONS (mg/kg)

PAH COMPOUND	C.U.V.*	S-1	S-2	S-3	S-4	S-5	S-6	S-8	S-9	S-10	S-11	S-12	S-13	S-14	S-15	S-16	S-17	S-18	DUP
Naphthalene	13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	2.7
Acenaphthylene	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9	ND
Acenaphthene	-	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	0.17	ND	3.6	11
Fluorene	30	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	3.3	8.8
Phenanthrene	30	0.19	1.6	ND	0.17	ND	3.6	0.26	0.82	6.1	0.26	15	ND	24	1.7	1.7	0.92	25	47
Anthracene	30	0.19	0.19	ND	ND	ND	1.2	ND	0.79	4.8	ND	6	ND	3.3	1.3	0.28	0.13	4.4	15
Fluoranthene	30	0.16	1.7	ND	ND	ND	3	0.26	0.68	7.3	ND	17	8.1	20	1.3	1.6	1.3	24	49
Pyrene	30	0.34	1.1	ND	0.15	0.89	2.9	0.6	0.76	7.3	ND	11	3.9	13	1.4	3.8	1.3	15	49
Benzo(a)Anthracene	0.22	ND	0.38	ND	ND	ND	2.1	0.1	0.74	4.4	ND	13	4.1	8.3	ND	0.67	0.34	5.7	19
Chyrsene	0.40	0.11	0.66	ND	ND	ND	5.1	0.16	0.12	14	ND	17	14	17	10	1.2	0.66	8.4	24
Benzo(b)Fluoranthene	1.10	ND	0.46	ND	ND	ND	ND	ND	ND	6.4	ND	8.9	3.1	6.3	ND	0.73	0.47	4.6	12
Benzo(k)Fluoranthene	1.10	ND	0.47	ND	ND	ND	ND	ND	0.27	4.4	ND	8.4	2.4	5.4	ND	0.74	0.51	5.1	13
Benzo(a)Pyrene	0.06	ND	0.38	ND	ND	ND	ND	ND	ND	6.2	ND	9	1.8	6.4	1.3	0.81	0.49	5.3	15
Indeno(1,2,3-cd)Pyrene	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)Anthracene	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)Perylene	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PAHs		0.99	7.17	0	0.32	0.89	17.9	1.38	4.18	60.9	0.26	107.3	37.4	103.7	17	11.84	6.12	112.6	265.5

ND = below instrument detection limit
*** from NYSDEC Clean Up Values TAGM**
Values in shaded areas exceed clean up values

TABLE 7-4

ACCURATE DIE CASTING -- OUTFALL SOILS DATA
POLYCHLORINATED BIPHENYLS

SAMPLE LOCATION CONCENTRATIONS (mg/kg)

PCB ISOMER	S-1	S-2	S-3	S-4	S-5	S-6	S-8	S-9	S-10	S-11
Aroclor - 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1248	ND	ND	ND	ND	1.9	ND	ND	ND	2.6	ND
Aroclor - 1254	ND	ND	ND	ND	ND	0.7	ND	ND	ND	ND
Aroclor - 1260	ND	ND	ND	0.32	ND	ND	ND	0.37	ND	0.24

PCB ISOMER	S-12	S-13	S-14	S-15	S-16	S-17	S-18	DUP	PS-1	PS-2
Aroclor - 1016	ND	0.43	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1242	ND	1	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1248	1.7	ND	1.5	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor - 1260	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND

ND = below instrument detection limit
The NYSDEC Cleanup Standard for PCB is 1.0 mg/kg.
Samples S-1to S-18 are from the outfall area; samples PS-1 & PS-2 are from the transformer yard.

may be enhanced due to the presence of sand and gravel in this area. This may account for its migration toward Well MW-4 and soil sample locations S-13 and S-14.

CHAPTER 8

SUMMARY AND CONCLUSIONS

8.1 SITE HYDROGEOLOGY

The site hydrogeology is comprised of two principal overburden units overlying bedrock. The shallow overburden unit is comprised of sand, gravel, and silt; is of relatively high permeability compared to the lower unit; and ranges in thickness from 14 to 39 feet. That unit is underlain by a low permeability silt layer that has been interpreted to be glacial till. It ranges in thickness from 0 to over 20 feet. The till layer pinches out at the south end of the site and thickens toward the north. The overburden is underlain by fractured shale and limestone bedrock. In the vicinity of MW-10, the bedrock appears to be extremely weathered. In other areas, the bedrock appears more competent but still fractured. Bedrock slopes steeply between MW-10 and Bishop Brook.

Groundwater flow is toward the north at a rate of approximately .5 feet per day. Although the till layer suggests a certain amount of isolation between the overburden aquifer and the bedrock aquifer, impacts to the bedrock aquifer do indicate some communication between the two aquifers.

8.2 GROUNDWATER QUALITY

Groundwater at the site has been impacted by trichloroethene. The areal extent of groundwater impact is limited to a band approximately 600 feet wide at its widest point and extends from MW-13 north to Bishop Brook. Concentrations diminish in a short distance from MW-3. Concentrations of TCE at and below standards have also been detected in Monitoring Wells MW-15 and MW-16. Given these concentrations, further study of the bedrock is not deemed necessary.

Chromium was in Wells MW-9 and MW-12 at levels that were elevated compared to other wells on site.

8.3 SURFACE WATER QUALITY

Two samples from Bishop Brook downstream from the seep had detectable levels of TCE. The concentrations were quantified at 3 ppb, but this result was qualified as being imprecise because it was so close to the method quantitation limit. The 3 ppb concentration measured at two of three downstream sampling points is below NYSDEC guidance of 11 ppb for Class C surface water. The fact that there was no TCE detected upstream of the seep or at Sampling Point 5 suggests that groundwater discharging to the creek along the entire reach does not impact the stream. It suggests further that the previously identified seep is probably the source of TCE to the stream.

8.4 STREAM SEDIMENT QUALITY

Based on results of analysis of 12 sediment samples collected from Bishop Brook, there appears to be only minimal impact. Trace levels of TCE, 1,2-DCE, and 2-butanone were detected in three of the samples. Based on these findings, it is concluded that sediment quality warrants no additional consideration.

8.5 SOIL QUALITY

TCE in soil is concentrated in the vicinity of MW-3. In the investigations at this site, 25 soil samples have been collected and evaluated for TCE contact. Concentrations in the vicinity of MW-3 range from .39 ppm in MW-10 to 7500 ppm in MW-3. Beyond MW-10, there is minimal to no TCE detected. TCE contamination away from the immediate source in the area of MW-3 is attributed to vapor migration through the soil.

In the area of the outfall and 1987 release, concentrations of PCBs and PAHs exceed NYSDEC cleanup guidance values along the swale and in the eastern and southeastern portion of the clearing. Appropriate further action for this area will be discussed in the Feasibility Study.

8.6 RISK ASSESSMENT CONCLUSIONS

The baseline risk assessment has detailed the risks to human health posed by environmental conditions at the Accurate Die Casting facility. Under current land use conditions, the one complete pathway of exposure to site-related chemicals is water contact recreation in Bishop Brook. Risks from this exposure are calculated to be minimal.

If the site is redeveloped for residential and/or commercial and industrial usage, additional pathways of exposure are possible. Use of the impacted groundwater for private supply would pose an unacceptable risk to human health. As discussed in the risk assessment, this use is considered highly improbable. Inhalation of TCE and PCE by site occupants would pose a minimal risk as well, based on ambient air sampling results during a February 1990 survey.

8.7 GENERAL CONCLUSIONS

The back half of the Accurate Die Casting facility has been impacted by spilled or leaked TCE. For the most part, impact is limited to groundwater between the building and Bishop Brook. The impacted groundwater extends roughly 300 feet east and west of a north-south line passing through MW-3. Groundwater in the bedrock aquifer has been impacted to a distance of at least 130 feet downgradient from MW-3 and possibly in Wells MW-15 and MW-16, although the low concentrations in MW-15 and MW-16 may not necessarily be derived from Accurate Die Casting. Elevated levels of chromium were detected in MW-9 and MW-12, with the standard being exceeded in MW-9.

Impact to soils is in the form of residual TCE in the immediate vicinity of MW-3 and in the form of vapor migration to a distance of about 130 feet of MW-3. Also, soils in the vicinity of the 1987 oil release retain residual PAHs and PCBs.

Impact to surface water is minimal, with concentrations that do not exceed the NYSDEC guidance value. Sediment does not appear to be impacted at a level warranting further concern.

8.8 FUTURE ACTIVITY

A feasibility study will be completed that will evaluate alternatives for remediation. It has been determined that additional remedial action is warranted on the site. The Feasibility Study will focus on three areas of concern: (1) impacted groundwater; (2) impacted soil in source area; and (3) impacted soils at the oil spill site. The groundwater area of concern will be made up of two components:

1A Free product and source area contamination
1B Dissolved TCE plume

The soil area of concern at the TCE source is currently being addressed with an IRM action.

REFERENCES

Barrio-Lage, G., F.Z. Parsons, R.S. Nassar, and P.A. Lorenzo. 1986. Sequential dehalogenation of chlorinated ethenes. Environ. Sci. Technol. 20:96-99.

Barrio-Lage, G., F.Z. Parsons, and R.S. Nassar. 1987. Kinetics of the depletion of trichloroethene. Environ. Sci. Technol. 21:366-369.

Bouwer, Herman, and R.C. Rice, 1976. A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells, Water Resources Research, V. 12, No. 3, pp. 423-428.

Bouwer, Herman, 1989. The Bouwer and Rice Slug Test - An Update, Groundwater, Vol. 27, No. 23, pp. 304-309.

Fathepure, B.Z.., J.P. Nengu, and S.A. Boyd. 1987. Anaerobic bacteria that dechlorinate perchloroethene. Appl. Environ. Microbiol. 53:2671-2674.

Howard, P.H., 1990, Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Lewis Publishers, Michgan, 574 pp.

Kleopfer, R.D., D.M. Easley, B.B. Haas, T.G. Deihl, D.E. Jackson, and C. J. Wurrey. 1985. Anaerobic degradation of trichloroethylene in soil. Environ. Sci. Technol. 19:277-279.

Lanzarone, N.A. and P.L. McCarty. 1990. Column studies on methanotrophic degradation of trichloroethylene and 1,2-dichloroethane. Ground Water 28:910-919.

Little, C.D., A.V. Palumbo, S.E. Herbes, M.E. Lidstrom, R.L. Tyndall, and P.J. Gilmer. 1988. Trichloroethylene biodegradation by a methane-oxidizing bacterium. Appl. Environ. Microbiol. 54:951-956.

Mendoza, C.A. and T.A. McAlary. 1990. Modeling of Ground-water contamination caused by organic solvent vapors. Ground Water 28:199-206.

Schwille, F. Dense Chlorinated Solvents in Porous and Fractured Media: Model Experiments. Lewis Publishers, Chelsea, MI. 1988.

Stearns & Wheler, 1992. Remedial Investigation/Feasibility Study Work Plan, Accurate Die Casting Facility.

Stearns & Wheler, 1990. Summary Report: Phase II Environmental Assessment and Remediation Efforts at the Accurate Die Casting Facility, Fayetteville, New York (3 volumes).

USEPA, 1989. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final, EPA/540-1-89/002, Officof Emergency and Remedial Response, Washington, D.C. 20460.

USEPA, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, OSWER Directive 9355-8-01, U.S. Department of Commerce, NTIS, Springfield, VA.

USEPA, 1987. The Compendium of Superfund Field Operation Methods, EPA/540/P-87/001, NTIS, Springfield, VA.

Vogel, T.M., C.S. Criddle, and P.L. McCarty. 1987. Transformation of halogenated aliphatic compounds. Environ. Sci. Technol. 21:722-736.

Vogel, T.M. and P.L. McCarty. 1985. Biotransformation of tetrachloroethylene to trichloroethylene, dichloroethylene, vinyl chloride, and carbon dioxide under methanogenic conditions. Appl. Environ. Microbiol. 49:1080-1083.

Wilson, B.H., G.B. Smith, and J.F. Rees. 1986. Biotransformation of selected alkylbenzenes and halogenated aliphatic hydrocarbons in methanogenic aquifer material: A microcosm study. Environ. Sci. Technol. 20:997-1001.

Wilson, J.T. and B.H. Wilson. 1985. Biotransformation of trichloroethylene in soil. Appl. Environ. Microbiol. 49:242-243.

Winkley, S.J., 1989. The Hydrogeology of Onondaga County, New York. Master's Thesis, Syracuse University.

Stearns &
Wheler

ENVIRONMENTAL
ENGINEERS & SCIENTISTS

Appendices A through H

Remedial Investigation
Accurate Die Casting Facility
Fayetteville, New York

December 1993

cc
Jim Heckathorne
D Wright
AJG
TLB

Stearns & Wheler

ENVIRONMENTAL
ENGINEERS & SCIENTISTS

Final Report

Remedial Investigation
Accurate Die Casting Facility
Fayetteville, New York

December 1993

APPENDIX A

MONITORING WELL LOGS

Project Name: Accurate Die Casting
Job No. 1682
Start
Date 8/24/89 Time 8:00 am
Finish
Date 8/24/89 Time 4:00 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-1

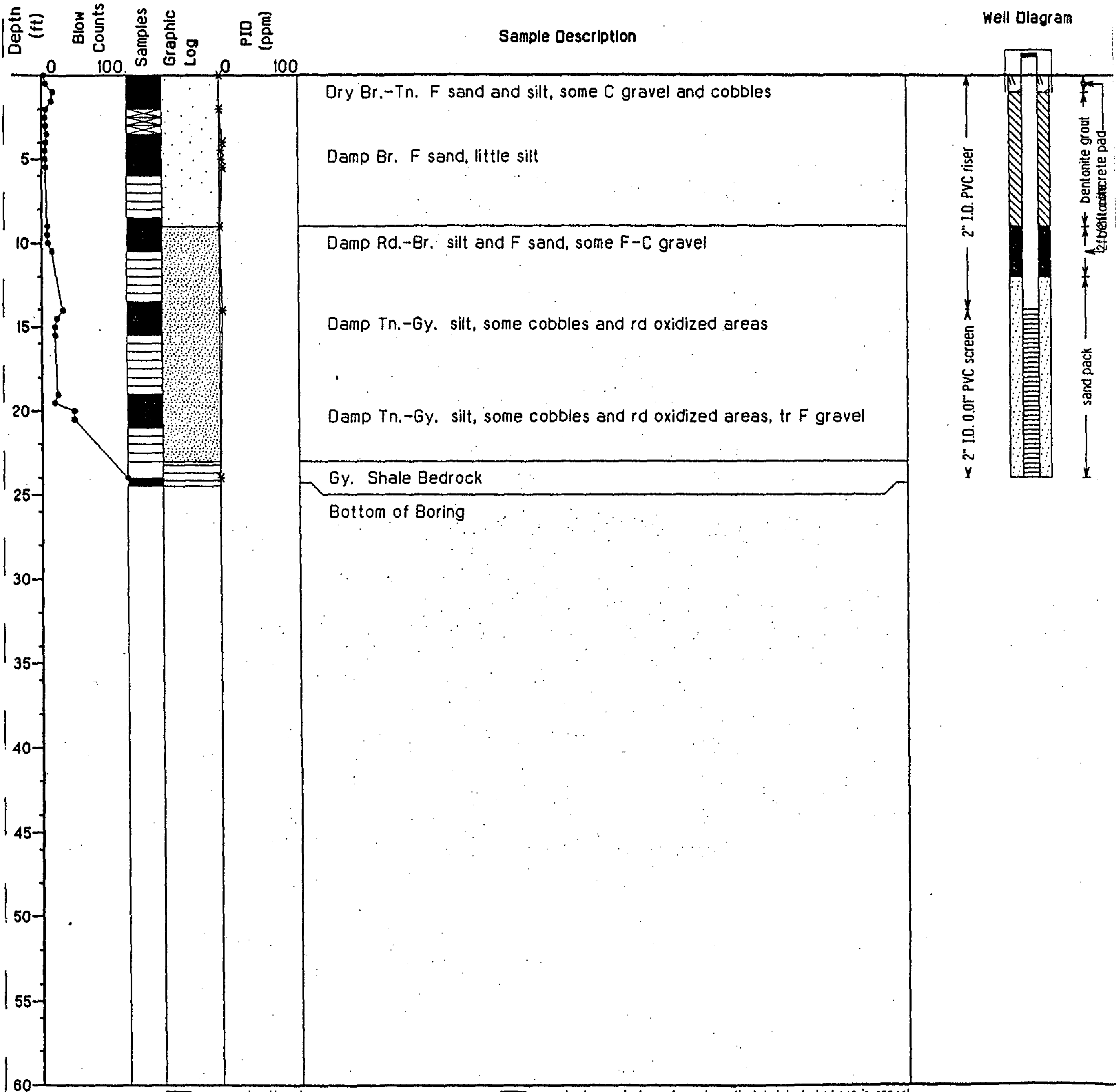
Drilling Company: Rochester D.C.
Driller:
S&W Inspector: S&W--TRB
Drill Rig Type: CME-45 ATV
Drilling Method: 4.25" i.d. HSA

Weather: sunny, 70-75 F

Elevation
99.36

X coord: 4943.151 feet
Y coord: 5138.164 feet

Groundwater Observations
Time :
Date : 8/24/89
Casing Depth:
Boring Depth:
Water Depth :



Dry Br.-Tn. F sand and silt, some C gravel and cobbles

Damp Br. F sand, little silt

Damp Rd.-Br. silt and F sand, some F-C gravel

Damp Tn.-Gy. silt, some cobbles and rd oxidized areas

Damp Tn.-Gy. silt, some cobbles and rd oxidized areas, tr F gravel

Gy. Shale Bedrock

Bottom of Boring

▨ - sample attempt
■ - sample recovered
▬ - grain size analysis performed, results tabulated elswhere in report
☐☐ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

e: Accurate Die Casting

1682

Start
/89 Time 10:00 am

Finish
/89 Time 5:00 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-2

any: Rochester D.C.

or: S&W--GG

e: CME-45 ATV

od: 4.25" i.d.HSA

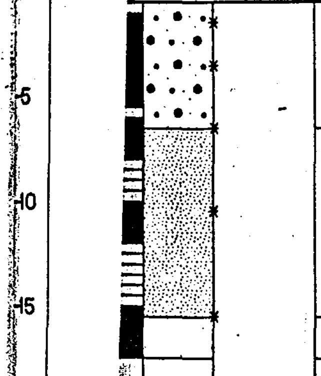
Weather: sunny, 70-75 F

Elevation
91.78

X coord: 5582.595 feet
Y coord: 5129.512 feet

Groundwater Observations
Time :
Date : 8/18/89
Casing Depth: 8 ft
Boring Depth:
Water Depth :

Graphic Log | PID (ppm) 0 100 | Sample Description | Well Diagram



Dry Gy.-Br. gravelly fill with silt, sand and pebbles

Damp Br. silt and clay, some pebbles and sand (fill)

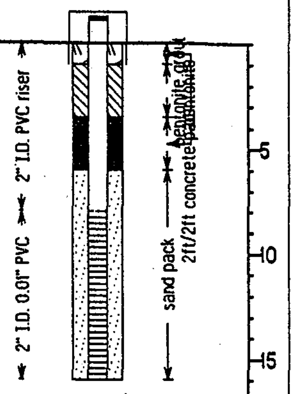
Moist dark Br. silt, some sand and clay. little Og. mottling

Wet sand layer 1-2" thick

Wet Br. sand, some silt

dense dry gy. sand, some silt and pebbles, angular rock fragments

Bottom of Boring



20 25 30 35 40 45 50 55 60

▭ - sample attempt

■ - sample recovered

▬ - grain size analysis performed,results tabulated elswhere in report

▭ - core attempt

log have been generalized for clarity of presentation. Significant changes
been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting

Job No. 1682

Start

Date 8/22/89 Time 8:30 am

Finish

Date 8/23/89 Time 4:30 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-3

Drilling Company: Rochester D.C.

Driller:

S&W Inspector: S&W--TRB

Drill Rig Type: CME-45 ATV

Drilling Method: 4.25" i.d.HSA

Weather:

Elevation
97.65

X coord: 5318.143 feet
Y coord: 5454.696 feet

Groundwater Observations

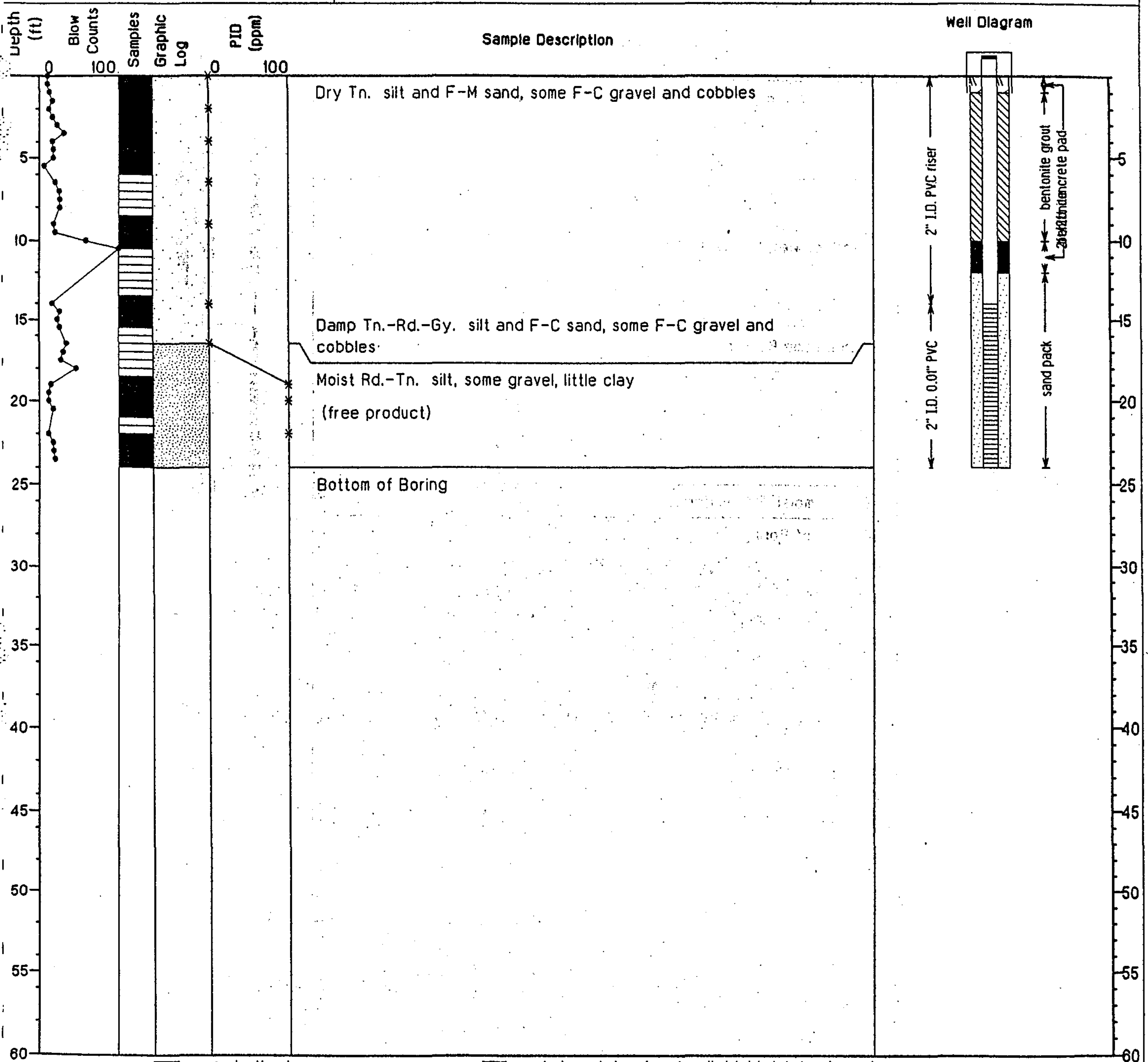
Time :

Date :

Casing Depth:

Boring Depth:

Water Depth :



Dry Tn. silt and F-M sand, some F-C gravel and cobbles

Damp Tn.-Rd.-Gy. silt and F-C sand, some F-C gravel and cobbles

Moist Rd.-Tn. silt, some gravel, little clay

(free product)

Bottom of Boring

▭ - sample attempt

■ - sample recovered

▬ - grain size analysis performed,results tabulated elswhere in report

▭▭ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting

Job No. 1682

Start

Date 1/5/90 Time 10:30 am

Finish

Date 1/5/90 Time 4:00 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-3SS

Drilling Company: Northstar

Driller:

S&W Inspector: S&W--DNS

Drill Rig Type: CME-55

Drilling Method: 6.25" i.d. HSA

Weather: Overcast, 35F

Elevation
97.81

X coord: 5312.998 feet
Y coord: 5455.147 feet

Groundwater Observations

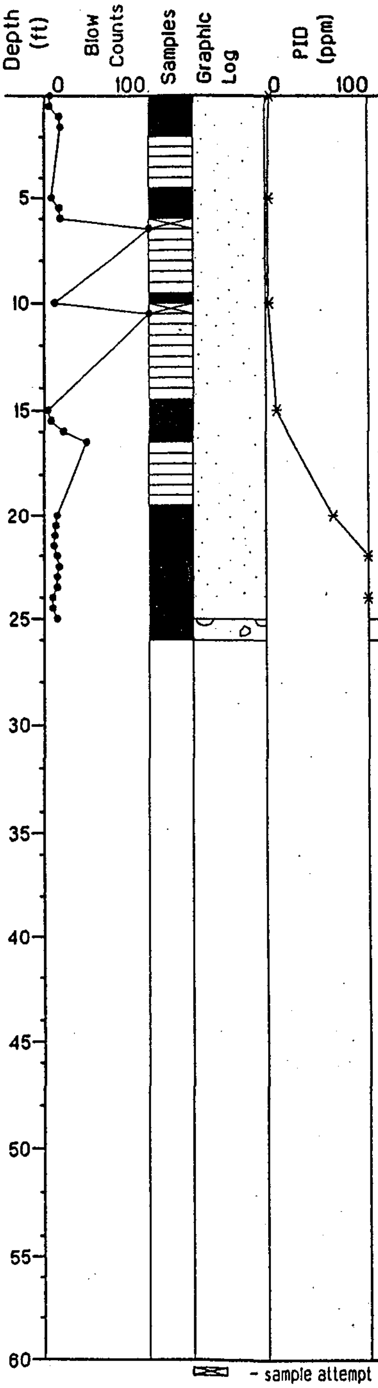
Time : 16:00

Date : 1/5/90

Casing Depth: 26.0

Boring Depth: 26.0

Water Depth : 18.0



Sample Description

Damp, loose Br. F-C sand, silt, gravel and cobbles

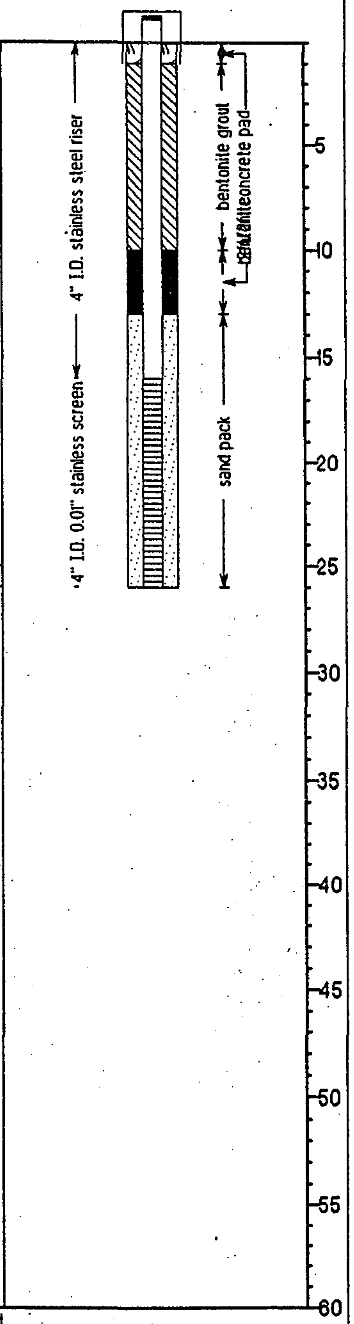
becomes wet, bouldery 5-10 feet

Same, some Rd.-Or. areas

Dense, moist, Rd. uniform clay.

Bottom of Boring

Well Diagram



▭ - sample attempt

■ - sample recovered

▬ - grain size analysis performed,results tabulated elswhere in report

▭ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: Accurate Die Casting

Job No. 1682

Start
Date 8/16/89 Time 11:00 am
Finish
Date 8/17/89 Time 1:30 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-4

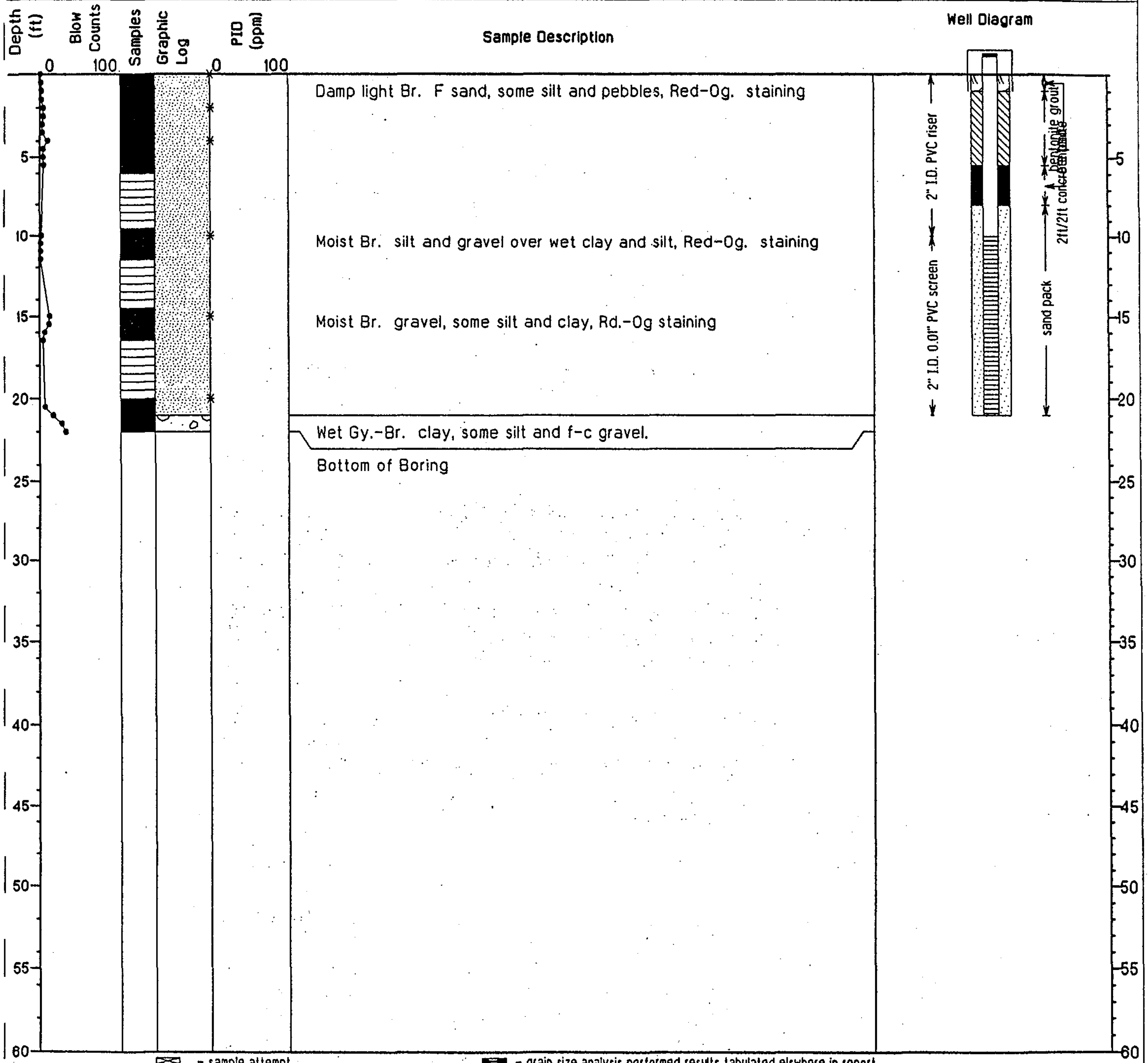
Drilling Company: Rochester D.C.
Driller:
S&W Inspector: S&W--GG
Drill Rig Type: CME-45 ATV
Drilling Method: 4.25" I.d.HSA

Weather:

Elevation
65.62

X coord: 6152.312 feet
Y coord: 5197.201 feet

Groundwater Observations
Time : 15:30
Date : 8/17/89
Casing Depth: 20 ft
Boring Depth:
Water Depth : 16.5



Damp light Br. F sand, some silt and pebbles, Red-Og. staining

Moist Br. silt and gravel over wet clay and silt, Red-Og. staining

Moist Br. gravel, some silt and clay, Rd.-Og staining

Wet Gy.-Br. clay, some silt and f-c gravel.

Bottom of Boring

⌧ - sample attempt
■ - sample recovered
▬ - grain size analysis performed, results tabulated elswhere in report
▭ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting

Job No. 1682

Start
Date 11/2/89 Time 8:00 am
Finish
Date 11/2/89 Time 4:00 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-5

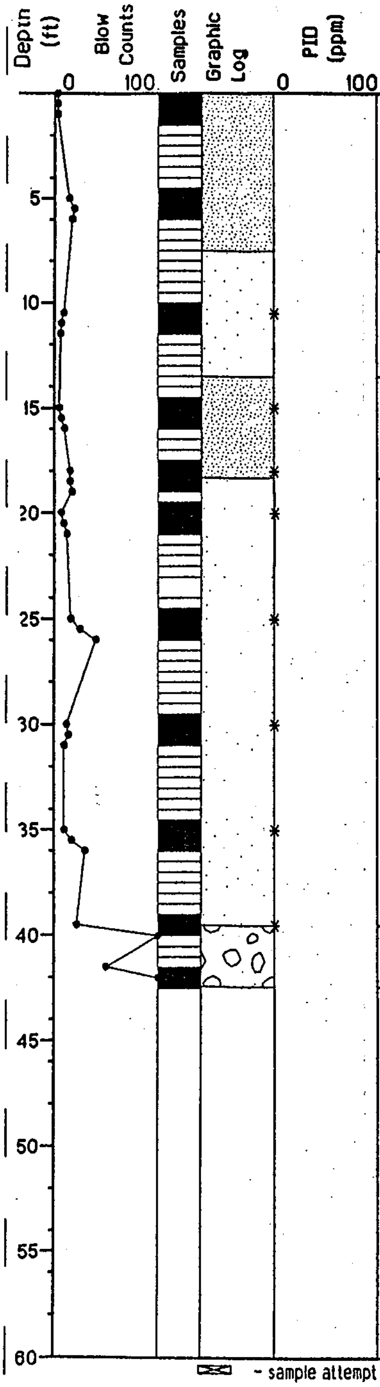
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--TRB
Drill Rig Type: CME-55 Truck
Drilling Method: 4.25" i.d.HSA

Weather: partly cloudy, 40 F

Elevation
88.21

X coord: 5624.097 feet
Y coord: 5612.209 feet

Groundwater Observations
Time :
Date :
Casing Depth:
Boring Depth:
Water Depth :



Sample Description

Br. silt, some F sand, little F-C gravel. Topsoil

Dry Tn. silt and F-C sand and gravel, some cobbles

(harder drilling)

Damp Br.-Tn.-Rd. F-C sand and gravel, little silt

(harder drilling)

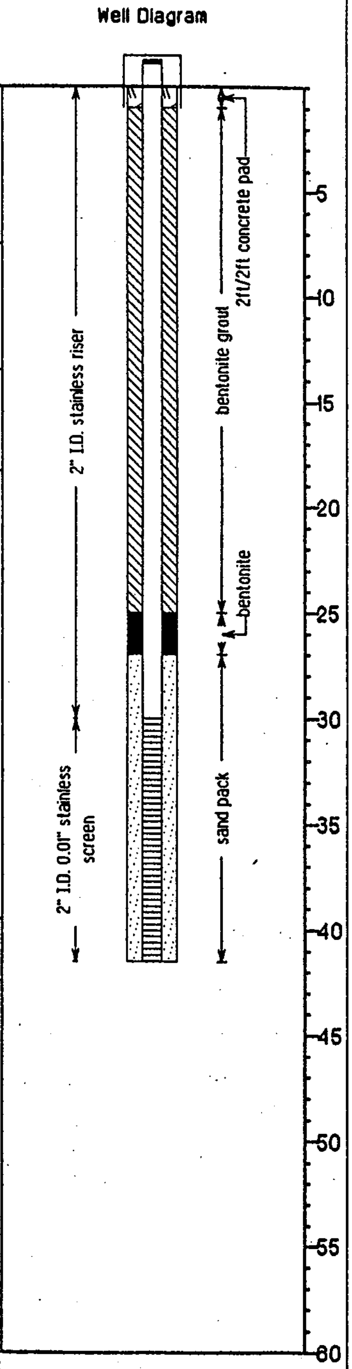
Damp Rd. silt and VF sand, some F-C gravel, few cobbles

Damp Tn.-Br. F-M sand, trace Tn. trace silt

Dense Tn.-Gy. F sand, some F-C subangular gravel, little silt

Bottom of Boring

Well Diagram



▭ - sample attempt
■ - sample recovered
▬ - grain size analysis performed,results tabulated elswhere in report
◻◻ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting

Job No. 1682

Start
Date 11/9/89 Time 9:30 am
Finish
Date 11/10/89 Time 5:00 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-6

Drilling Company: Northstar

Driller:

S&W Inspector: S&W--DNS

Drill Rig Type: CME-55

Drilling Method: 4.25" i.d.HSA

Weather: overcast, rain 50 F

Elevation
77.46

X coord: 5764.680 feet
Y coord: 5674.237 feet

Groundwater Observations

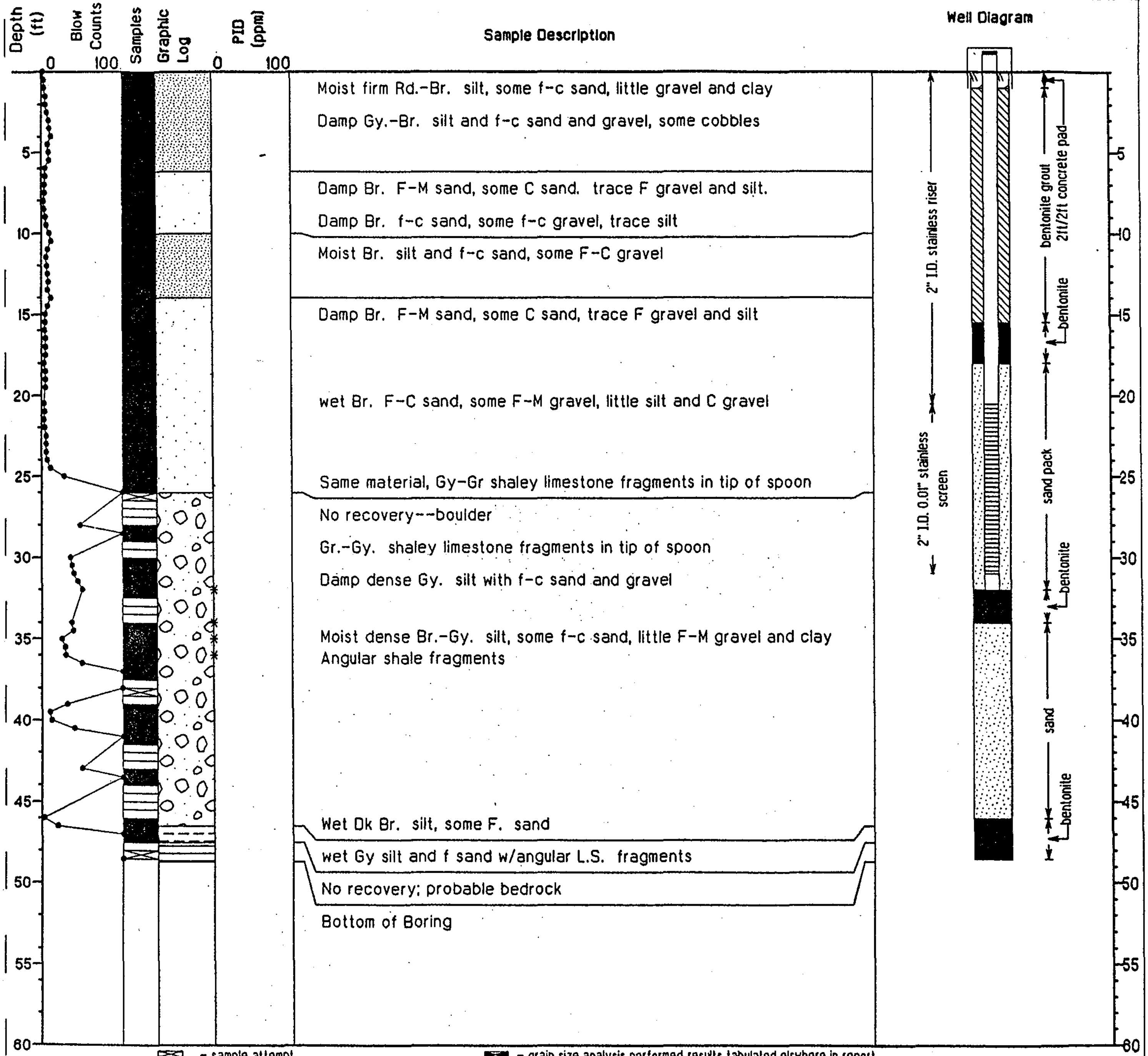
Time : 8:00

Date : 11/10/89

Casing Depth: 32 ft

Boring Depth:

Water Depth : 5.0 ft



Sample Description

Moist firm Rd.-Br. silt, some f-c sand, little gravel and clay

Damp Gy.-Br. silt and f-c sand and gravel, some cobbles

Damp Br. F-M sand, some C sand. trace F gravel and silt.

Damp Br. f-c sand, some f-c gravel, trace silt

Moist Br. silt and f-c sand, some F-C gravel

Damp Br. F-M sand, some C sand, trace F gravel and silt

wet Br. F-C sand, some F-M gravel, little silt and C gravel

Same material, Gy-Gr shaley limestone fragments in tip of spoon

No recovery--boulder

Gr.-Gy. shaley limestone fragments in tip of spoon

Damp dense Gy. silt with f-c sand and gravel

Moist dense Br.-Gy. silt, some f-c sand, little F-M gravel and clay
Angular shale fragments

Wet Dk Br. silt, some F. sand

wet Gy silt and f sand w/angular L.S. fragments

No recovery; probable bedrock

Bottom of Boring

⌧ - sample attempt

▬ - sample recovered

▬ - grain size analysis performed,results tabulated elswhere in report

▭ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: Accurate Die Casting
Job No. 1682
Start
Date 11/13/89 Time 3:30 pm
Finish
Date 11/21/89 Time 10:00 am

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-7

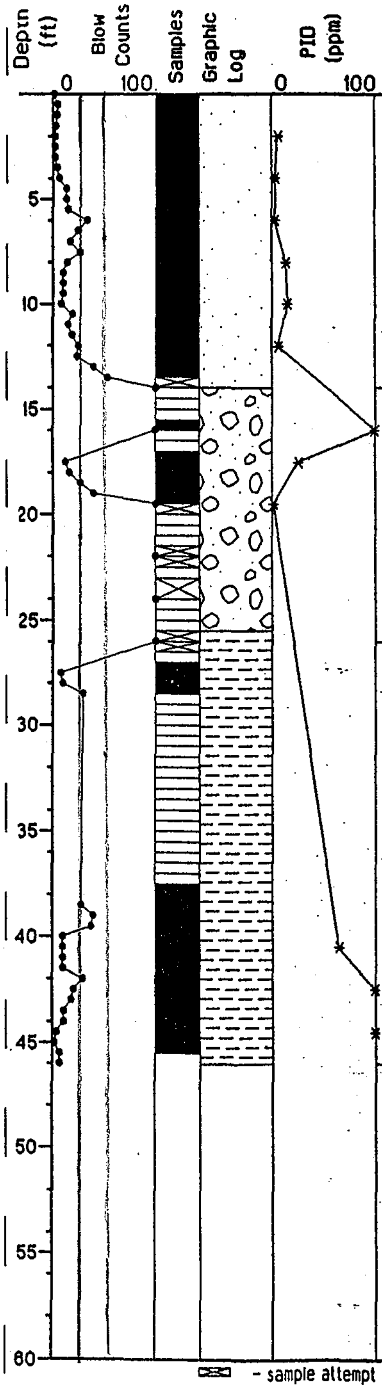
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--DNS
Drill Rig Type: CME-55
Drilling Method: 4.25" i.d.HSA

Weather: Sunny, 50F

Elevation
75.66

X coord: 5747.699 feet
Y coord: 5902.130 feet

Groundwater Observations
Time :
Date :
Casing Depth:
Boring Depth:
Water Depth :



Sample Description

Topsoil. Damp Br. F sand and silt, some F-C gravel.

Dry Tn.-Rd. F sand and F-C gravel, some cobbles, little silt

Moist Tn.-Br. F sand, some silt and F-C gravel and cobbles.

No recovery; very cobbly

Damp very dense Rd. silt and F sand, some F-C gravel

Gr.-Rd.-Tn. silt and F sand, some F-C gravel and cobbles

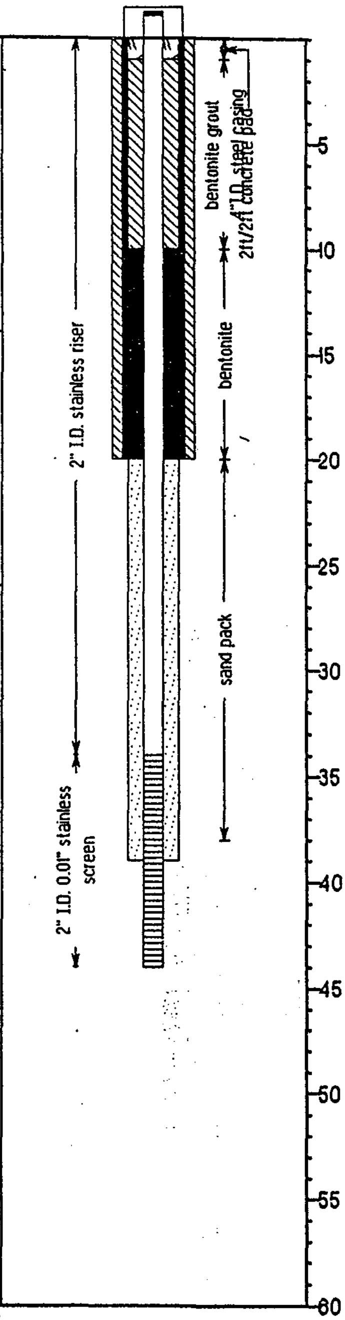
Gy.-Gr. weathered Sh. Bedrock w/ light and dark layers

Core attempt; no recovery

Highly weathered L.S. w/silt layers
(Raining heavily, though PID readings appear stable)

Bottom of Boring

Well Diagram



⌧ - sample attempt
■ - sample recovered
▬ - grain size analysis performed, results tabulated elswhere in report
▭ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting
Job No. 1682
Start
Date 11/8/89 Time 10:30 am
Finish
Date 11/8/89 Time 5:40 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-8

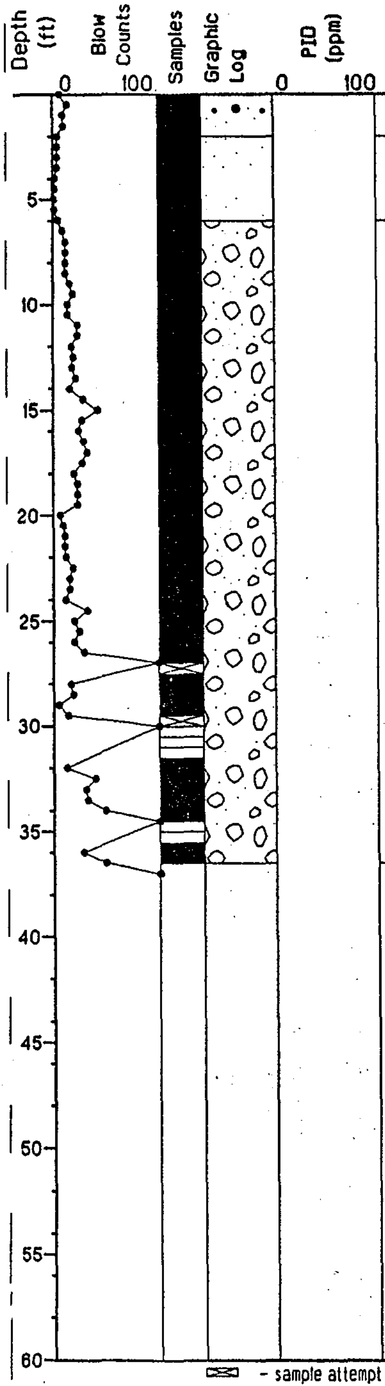
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--DNS
Drill Rig Type: CME-55
Drilling Method: 4.25" i.d.HSA

Weather: Overcast and cool. 50F

Elevation
88.21

X coord: 5733.879 feet
Y coord: 5255.257 feet

Groundwater Observations
Time : 15:15
Date : 11/8/89
Casing Depth: 38.0'
Boring Depth:
Water Depth : 25.9'



Sample Description

Moist Br. silt, some F-C sand w/brick and ash fragments.

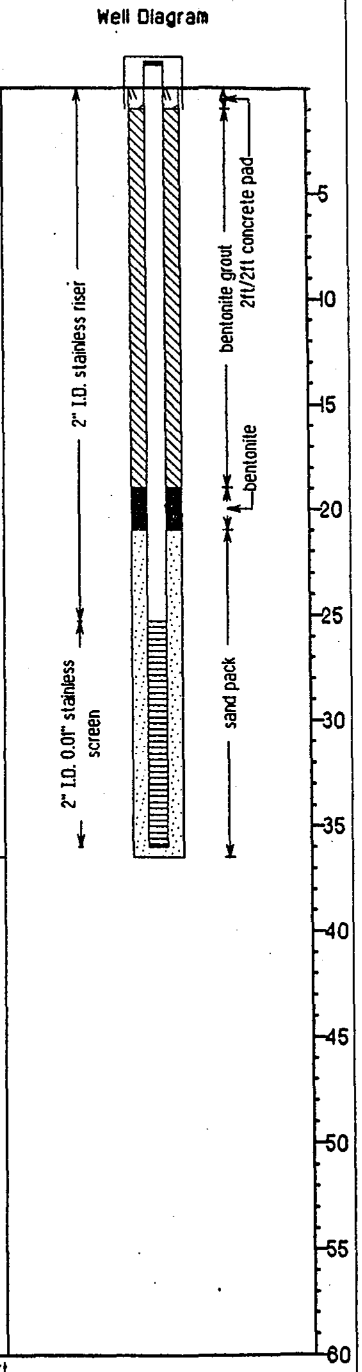
Moist Br. F-M sand, little C sand, trace cobbles, plant matter

Moist, firm Rd.-Br. silt and F-C sand, little clay and Sh. fragments

Damp, firm Rd.-Br. silt, some F-C sand and gravel, trace clay

Same, moist

Bottom of Boring



▭ - sample attempt
▬ - sample recovered
▬ - grain size analysis performed, results tabulated elswhere in report
▭ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting
Job No. 1682
Start
Date 11/7/89 Time 2:50 pm
Finish
Date 11/7/89 Time 4:05 pm

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-9

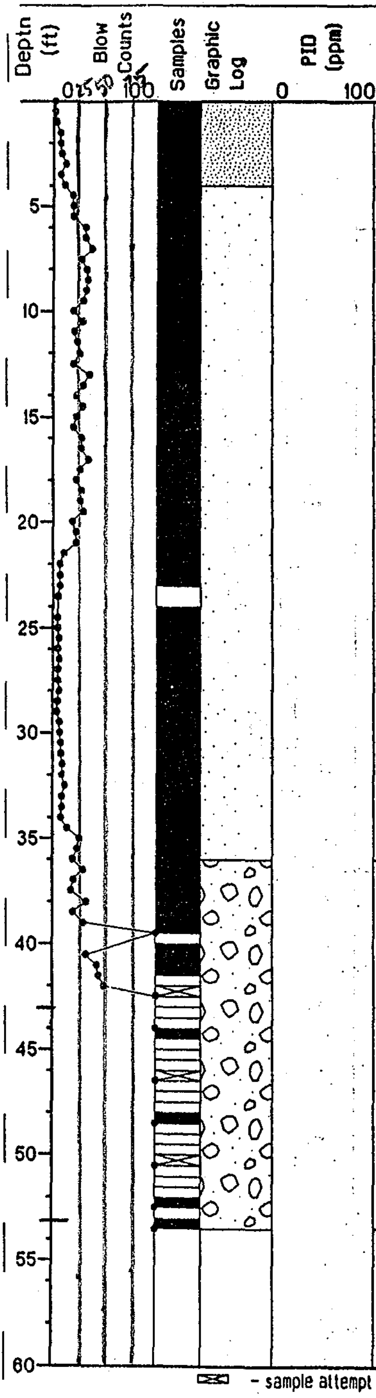
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--DNS
Drill Rig Type: CME-55
Drilling Method: 4.25" i.d.HSA

Weather: mostly cloudy, 55 F

Elevation
102.44

X coord: 5489.173 feet
Y coord: 5797.369 feet

Groundwater Observations
Time :
Date :
Casing Depth:
Boring Depth:
Water Depth :



Sample Description

Damp Br. silt, some F-C sand and cobbles, little clay

Dry Br.-Gy. F-C sand and gravel w/ cobbles, tr.-little silt

Dry Br.-Gy. F-C sand and gravel, some silt and cobbles

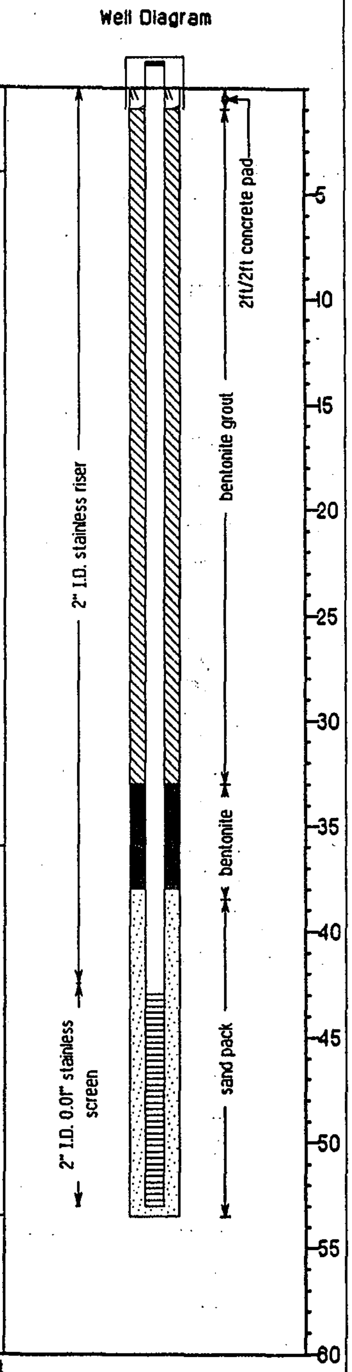
Moist Br. F-C sand and silt, some F gravel

Moist Gy.-Br. F-C sand and F-M gravel, little C gravel and silt

Dry dense Br.-Gr.-Gy. F-C sand and gravel and silt, trace clay

Similar material, some cobbles

Bottom of Boring



⊠ - sample attempt
■ - sample recovered
▬ - grain size analysis performed,results tabulated elswhere in report
□ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting
Job No. 2125
Start
Date 5/7/92 Time 7:30 am
Finish
Date 5/15/92 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-10

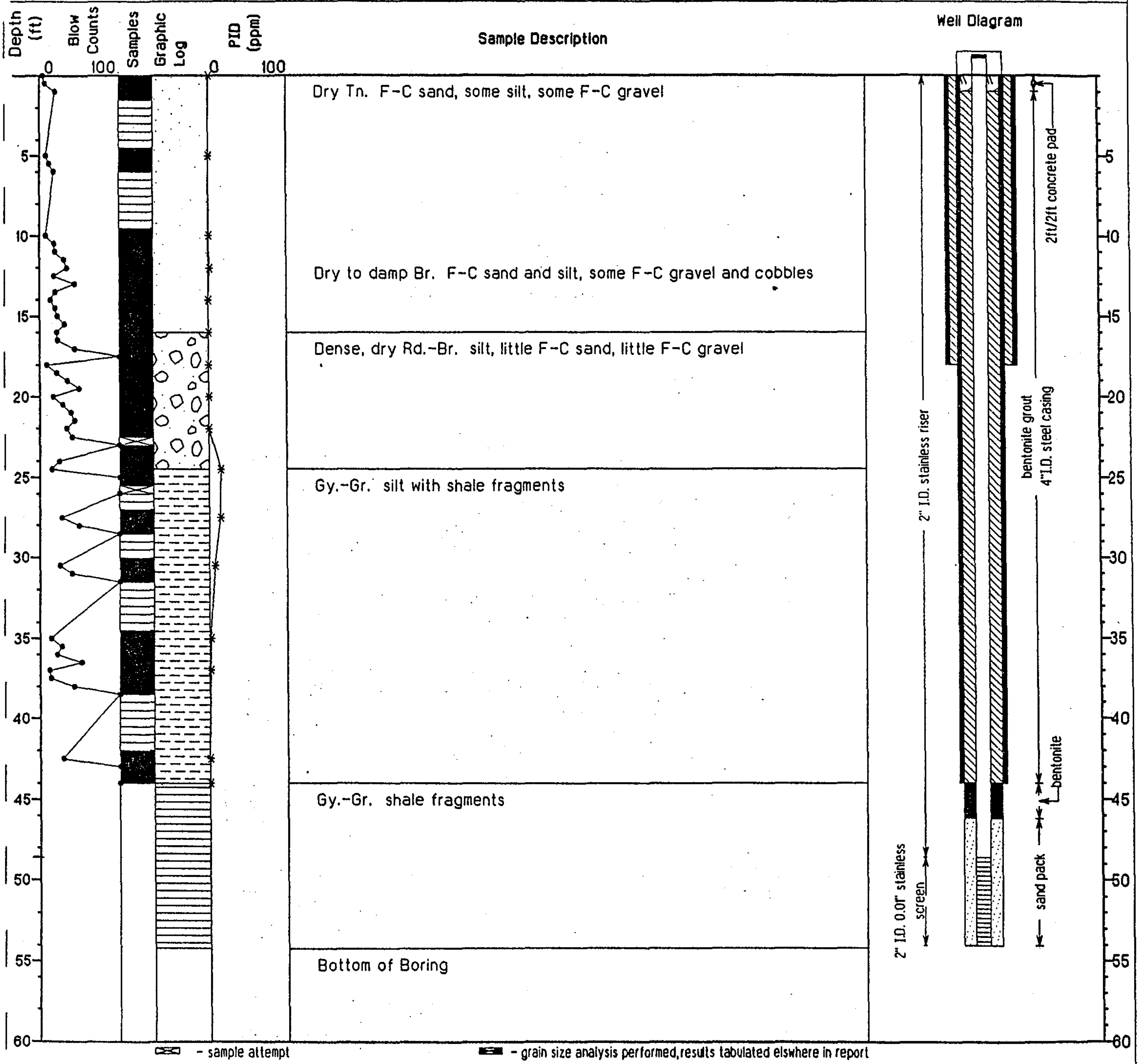
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--TRB/TLH
Drill Rig Type: CME 75
Drilling Method: HSA-mud rotary

Weather: sunny, 60 F

Elevation
97.51

X coord: 5377.000 feet
Y coord: 5464.816 feet

Groundwater Observations
Time :
Date : 5/13/92
Casing Depth: 44 ft
Boring Depth:
Water Depth : .03 ft.



Dry Tn. F-C sand, some silt, some F-C gravel

Dry to damp Br. F-C sand and silt, some F-C gravel and cobbles

Dense, dry Rd.-Br. silt, little F-C sand, little F-C gravel

Gy.-Gr. silt with shale fragments

Gy.-Gr. shale fragments

Bottom of Boring

⊠ - sample attempt
▬ - grain size analysis performed,results tabulated elswhere in report
■ - sample recovered
☐ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: Accurate Die Casting

Job No. 2125

Start
Date 5/6/92 Time 12:30 pm
Finish
Date 5/14/92 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-11

Drilling Company: Northstar

Driller:

S&W Inspector: S&W--TRB/TLH

Drill Rig Type: CME 75

Drilling Method: HSA-mud rotary

Weather: cloudy, 50

Elevation
91.48

X coord: 5468.564 feet
Y coord: 5476.841 feet

Groundwater Observations

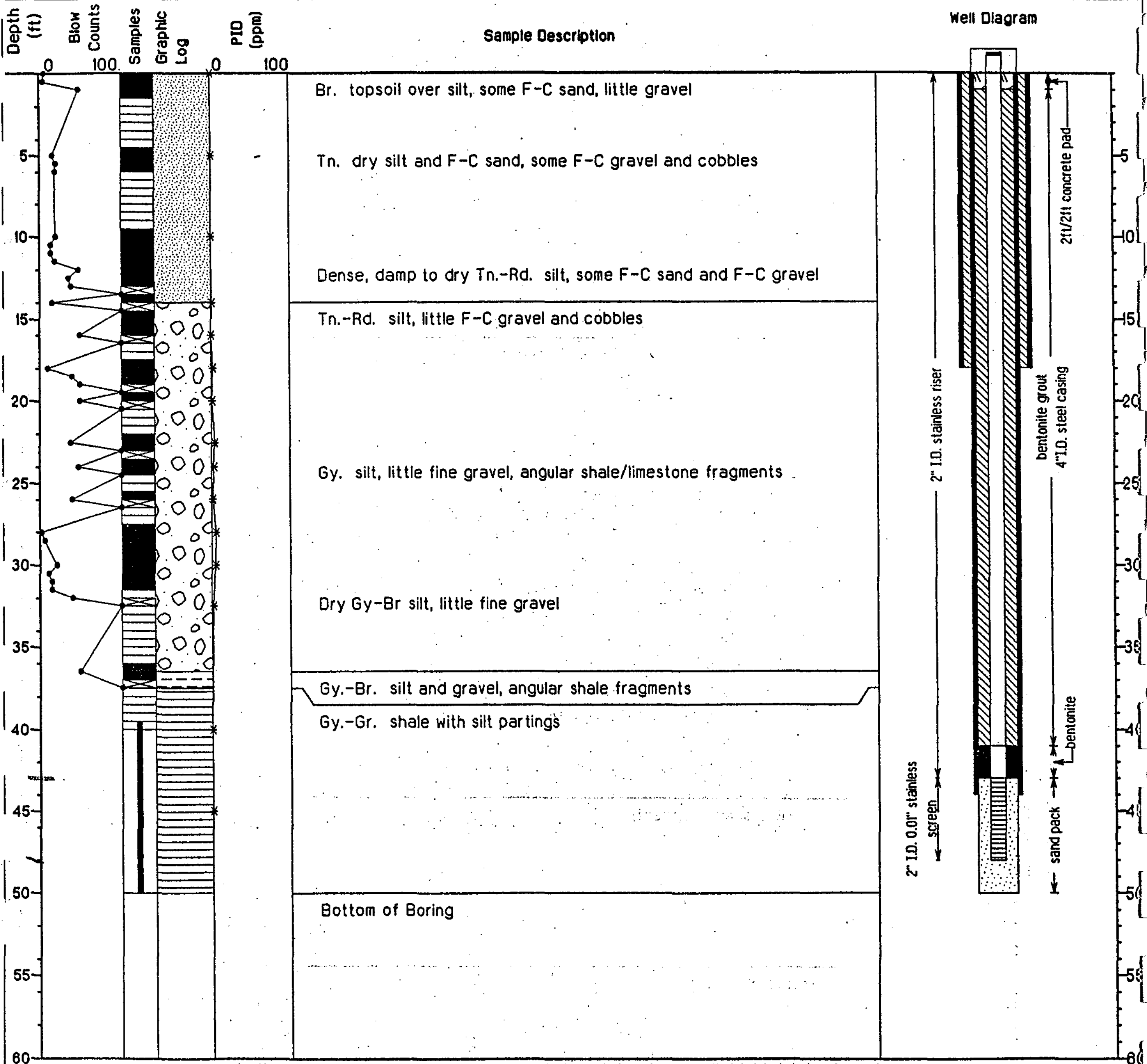
Time :

Date : 5/14/92

Casing Depth: 39.5 ft

Boring Depth:

Water Depth : 0.3 ft



Br. topsoil over silt, some F-C sand, little gravel

Tn. dry silt and F-C sand, some F-C gravel and cobbles

Dense, damp to dry Tn.-Rd. silt, some F-C sand and F-C gravel

Tn.-Rd. silt, little F-C gravel and cobbles

Gy. silt, little fine gravel, angular shale/limestone fragments

Dry Gy-Br silt, little fine gravel

Gy.-Br. silt and gravel, angular shale fragments

Gy.-Gr. shale with silt partings

Bottom of Boring

⊠ - sample attempt

■ - sample recovered

■ - grain size analysis performed,results tabulated elswhere in report

□ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: Accurate Die Casting
Job No. 2125
Start
Date 5/6/92 Time 12:30 pm
Finish
Date 5/14/92 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-11

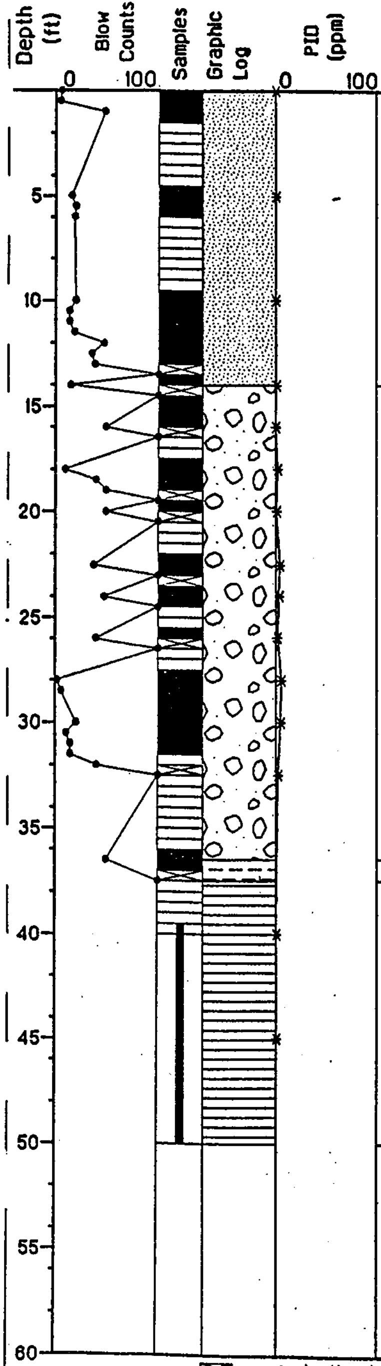
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--TRB/TLH
Drill Rig Type: CME 75
Drilling Method: HSA-mud rotary

Weather: cloudy, 50

Elevation
91.48

X coord: 5468.564 feet
Y coord: 5476.841 feet

Groundwater Observations
Time :
Date : 5/14/92
Casing Depth: 39.5 ft
Boring Depth:
Water Depth : 0.3 ft



Sample Description

Br. topsoil over silt, some F-C sand, little gravel

Tn. dry silt and F-C sand, some F-C gravel and cobbles

Dense, damp to dry Tn.-Rd. silt, some F-C sand and F-C gravel

Tn.-Rd. silt, little F-C gravel and cobbles

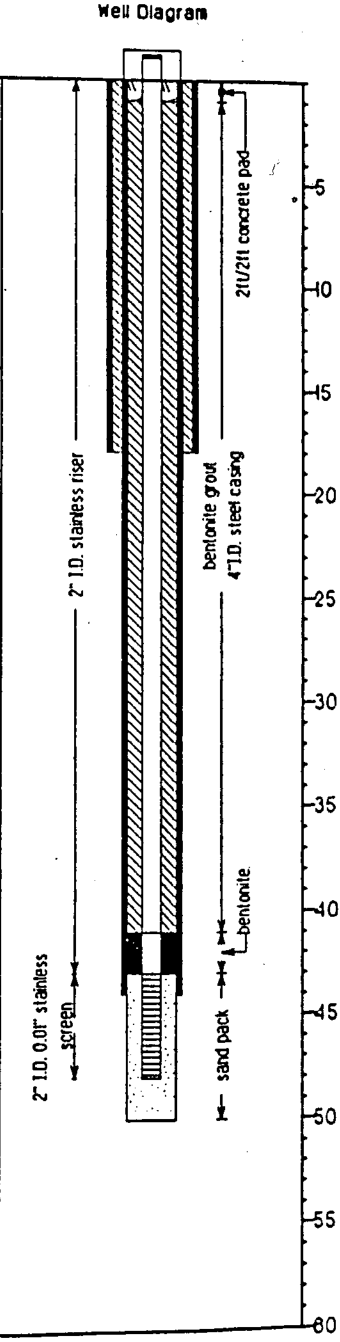
Gy. silt, little fine gravel, angular shale/limestone fragments

Dry Gy-Br silt, little fine gravel

Gy.-Br. silt and gravel, angular shale fragments

Gy.-Gr. shale with silt partings

Bottom of Boring



▭ - sample attempt
■ - sample recovered
▬ - grain size analysis performed,results tabulated elswhere in report
◻◻ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting
Job No. 2125
Start
Date 5/7/92 Time 7:30 am
Finish
Date 5/15/92 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-10

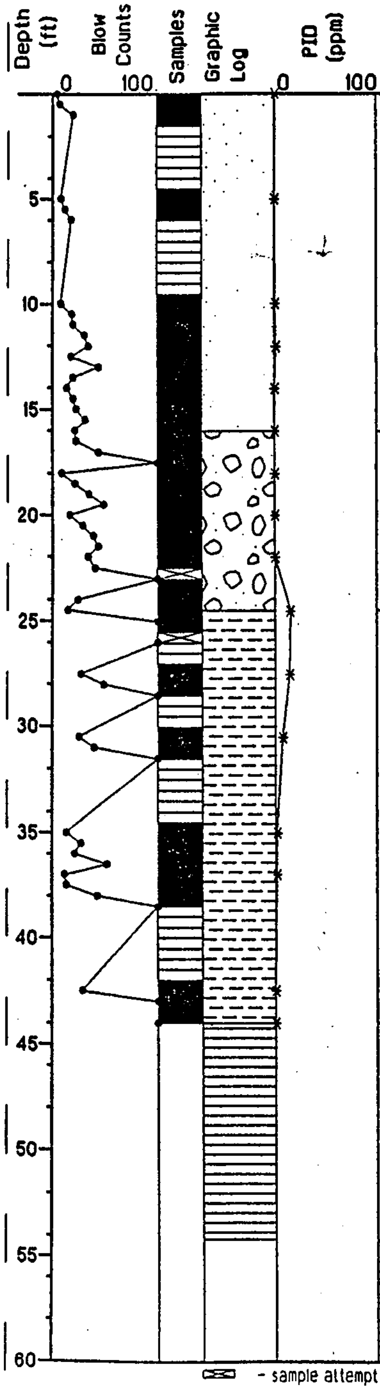
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--TRB/TLH
Drill Rig Type: CME 75
Drilling Method: HSA-mud rotary

Weather: sunny, 60 F

Elevation
97.51

X coord: 5377.000 feet
Y coord: 5464.816 feet

Groundwater Observations
Time :
Date : 5/13/92
Casing Depth: 44 ft
Boring Depth:
Water Depth : .03 ft.



Sample Description

Dry Tn. F-C sand, some silt, some F-C gravel

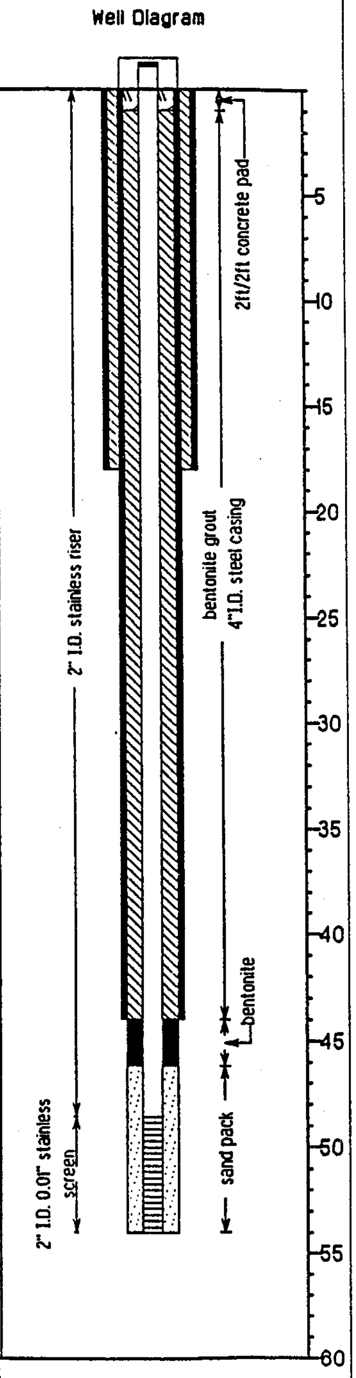
Dry to damp Br. F-C sand and silt, some F-C gravel and cobbles

Dense, dry Rd.-Br. silt, little F-C sand, little F-C gravel

Gy.-Gr. silt with shale fragments

Gy.-Gr. shale fragments

Bottom of Boring



▭ - sample attempt
■ - sample recovered
▬ - grain size analysis performed,results tabulated elswhere in report
▢▢ - core attempt

Project Name: Accurate Die Casting
Job No. 2125
Start
Date 5/8/92 Time 8:45 am
Finish
Date Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-12

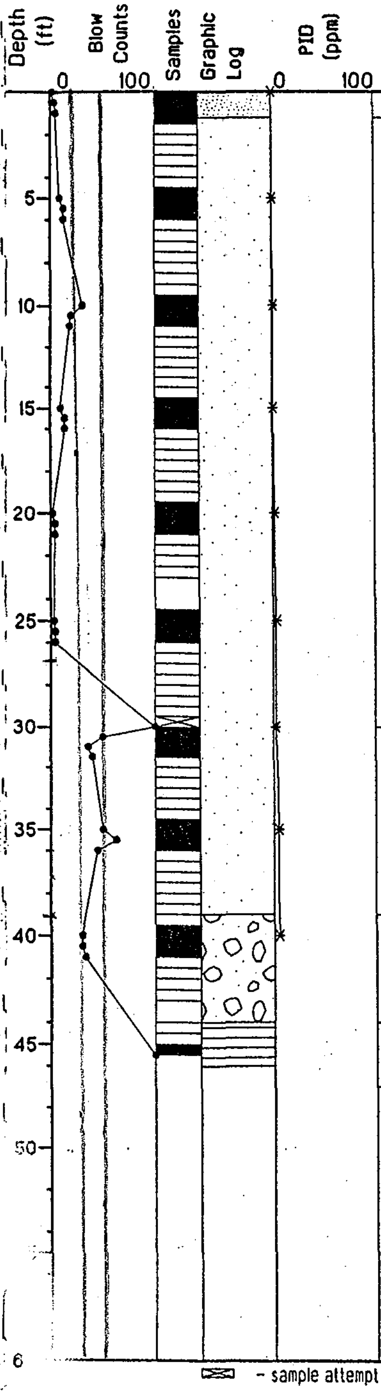
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--TLH
Drill Rig Type: CME 75
Drilling Method: HSA-mud rotary

Weather: overcast, 40F

Elevation
93.62

X coord: 5618.891 feet
Y coord: 5873.762 feet

Groundwater Observations
Time :
Date :
Casing Depth:
Boring Depth:
Water Depth :



Sample Description

Dry Tn. silt, little gravel

Dry Tn. sand, some gravel

Dry Tn.-Gy. fine to medium sand and gravel

Dry Tn.-Gy. fine sand, little silt, some gravel

Wet Tn.-Gy. medium sand, some silt, some gravel

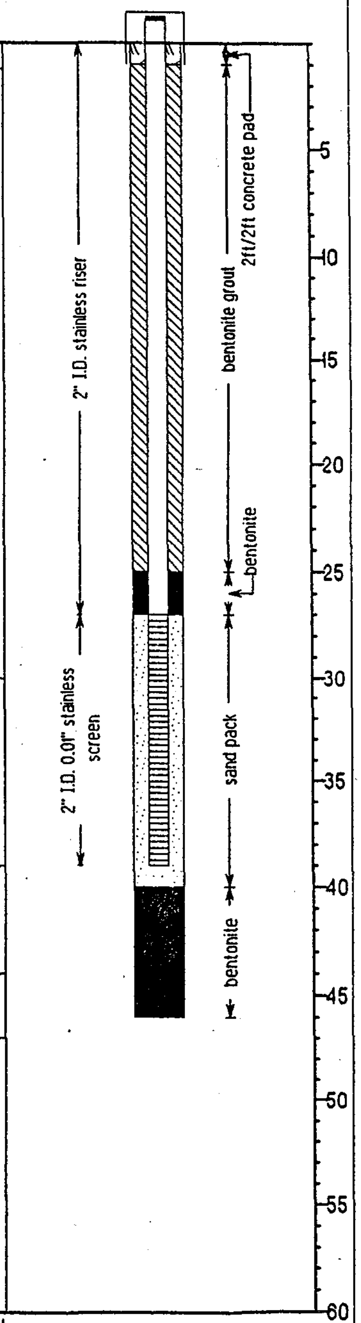
(harder drilling)

Wet Tn. silt and fine to medium gravel

Dense limestone bedrock

Bottom of Boring

Well Diagram



▨ - sample attempt
■ - sample recovered
■ - grain size analysis performed,results tabulated elswhere in report
☐ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting

Job No. 2125

Start
Date 5/7/92 Time 7:30 am
Finish
Date Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-13

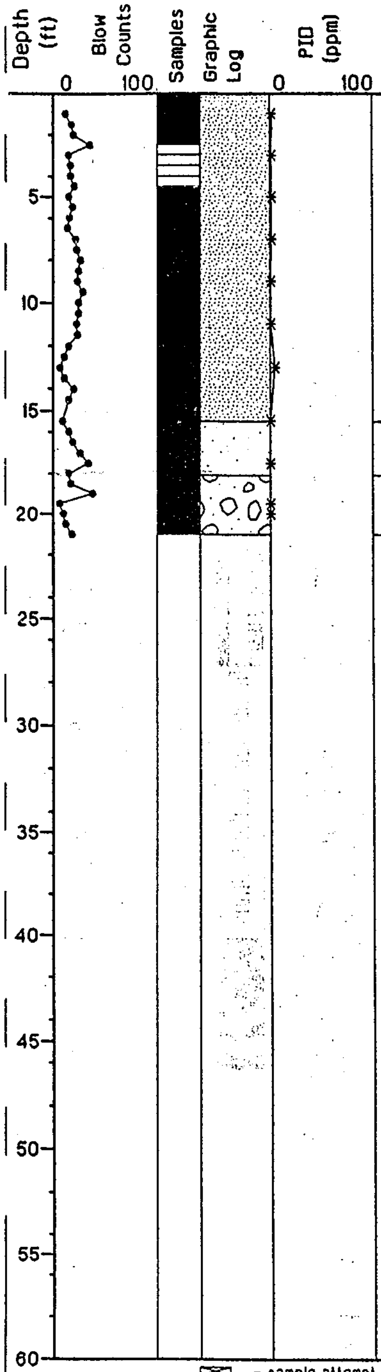
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--TLH/TRB
Drill Rig Type: CME 75
Drilling Method: HSA-mud rotary

Weather: sunny, 60 F

Elevation
98.73

X coord: 5265.000 feet
Y coord: 5423.000 feet

Groundwater Observations
Time :
Date :
Casing Depth:
Boring Depth:
Water Depth : dry



Sample Description

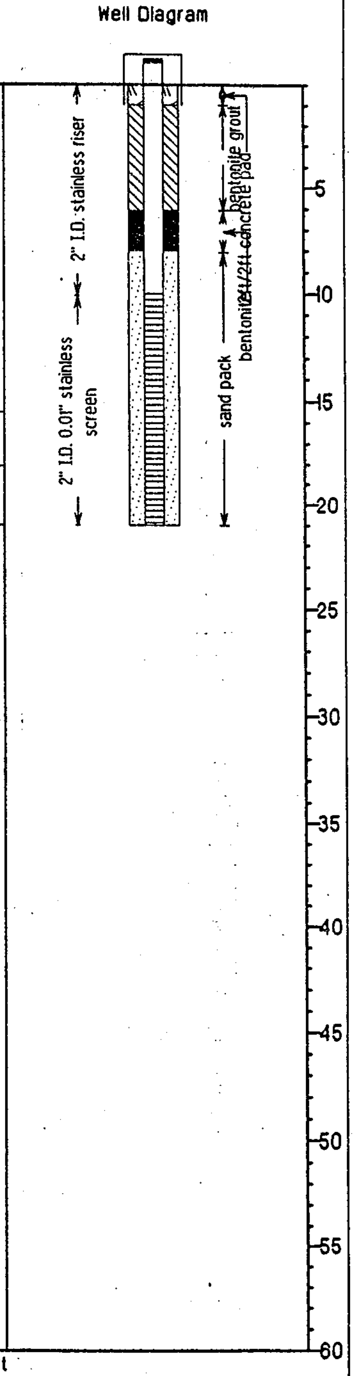
Tn. loose silt, some F-C sand, little gravel/cobbles

Similar material, some F-C gravel and cobbles

Dry, loose F-C sand and F-C gravel/cobbles

Br.-Rd. clay, little gravel/silt

Bottom of Boring



▭ - sample attempt
■ - sample recovered
▬ - grain size analysis performed,results tabulated elswhere in report
▭ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Sheet 1 of 1

Project Name: Accurate Die Casting
Job No. 2125
Start
Date 5/14/92 Time 3:00 pm
Finish
Date Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-14

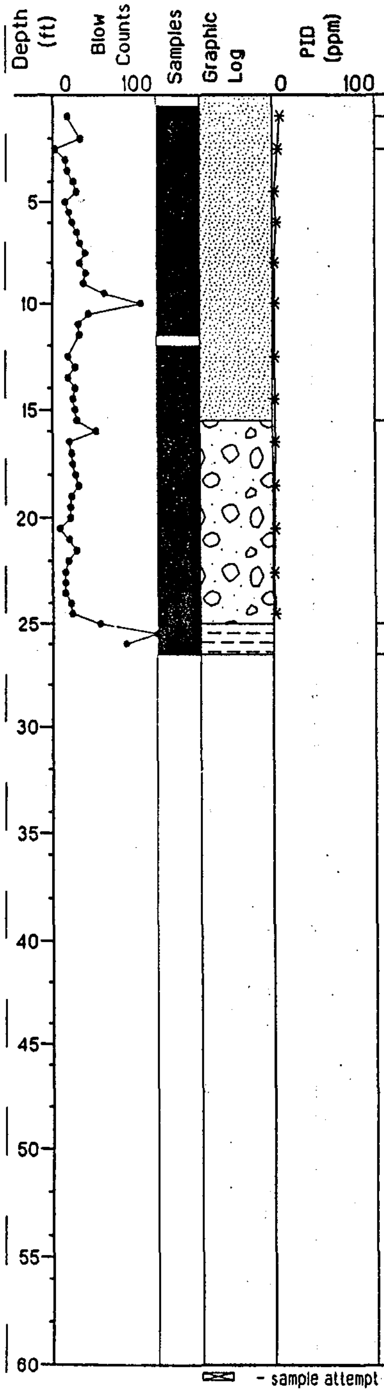
Drilling Company: Northstar
Driller:
S&W Inspector: S&W--TRB
Drill Rig Type: CME 75
Drilling Method: HSA-mud rotary

Weather: partly cloudy, 60F

Elevation
98.76

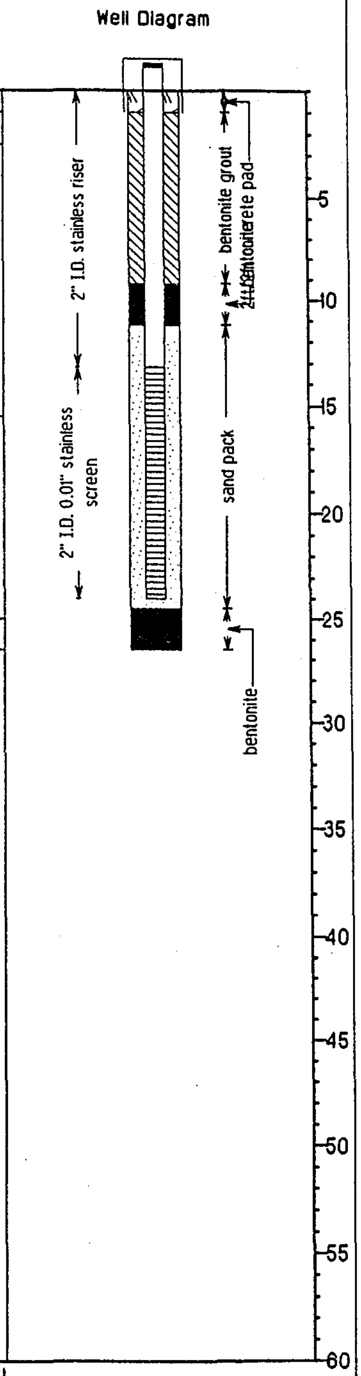
X coord: 5316.102 feet
Y coord: 5408.797 feet

Groundwater Observations
Time :
Date :
Casing Depth:
Boring Depth:
Water Depth :



Sample Description

Depth (ft)	
0–2.5	Dry Br. silt and F-C sand, F-C gravel and cobbles
2.5–15.5	Dry Tn. loose F-C sand and silt, some F-C gravel and cobbles
	Denser
15.5–25	Damp Tn. F-C sand and silt, some F.-M. gravel, trace cobbles
	Damp Rd. silt, little F-C sand, little F-C gravel, trace cobbles
25–26.5	Tn. silt and shale fragments, light/dark layers in silt, iron staining along apparent vertical partings
	Bottom of Boring



▭ - sample attempt
■ - sample recovered
■ - grain size analysis performed,results tabulated elswhere in report
◻◻ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: ACCURATE

Job No. 2125

Start
Date 8/3/93 Time 0810
Finish
Date 8/4/93 Time 1200

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-15

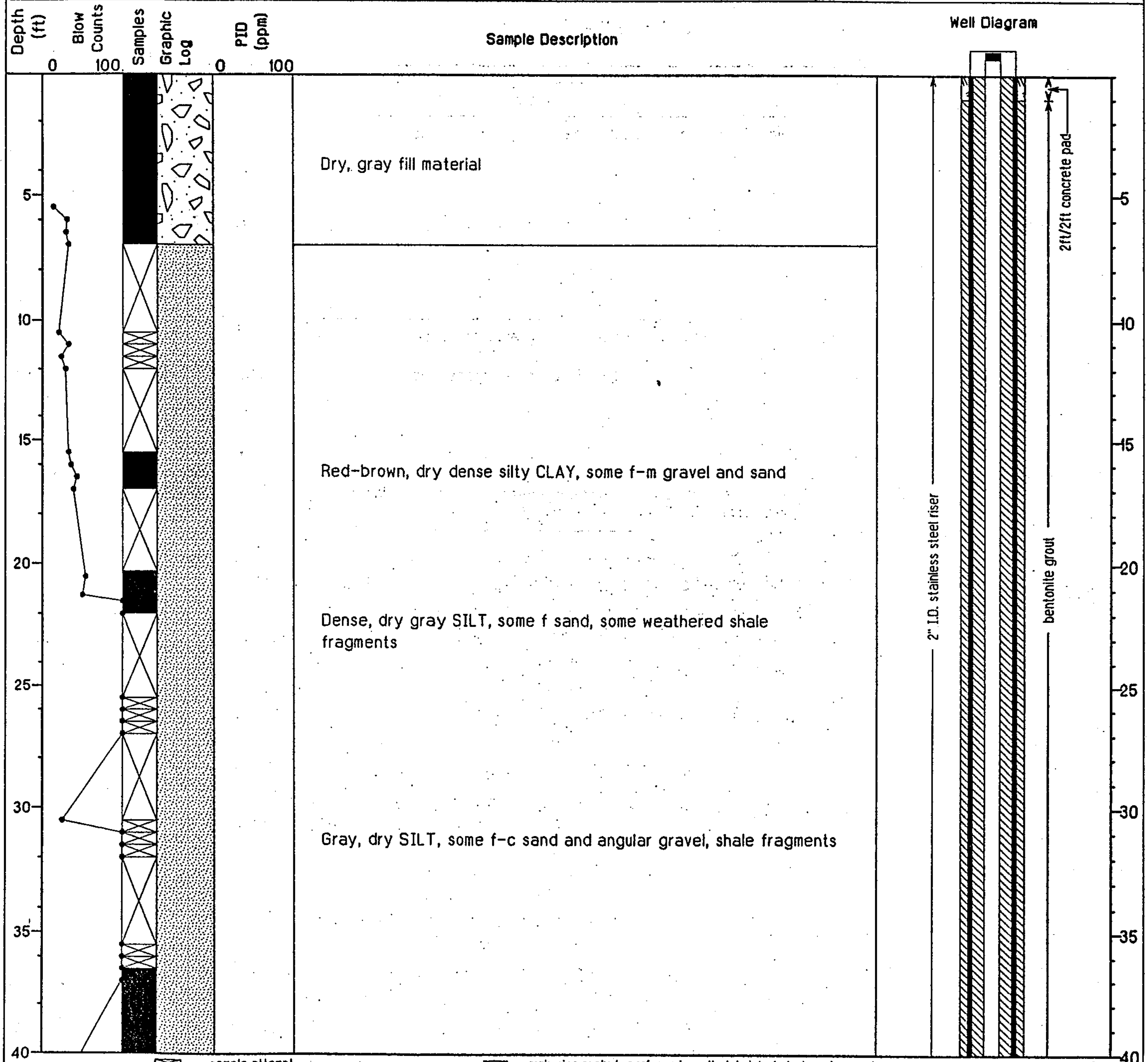
Drilling Company: NORTHSTAR
Driller: JOE
S&W Inspector: S&W--SLG
Drill Rig Type: CME TRUCK RIG
Drilling Method: 4.25"/6.25 i.d. HSA

Weather: HIGH OVERCAST, 70 F

Elevation

X coord: 4943.151 feet
Y coord: 5138.164 feet

Groundwater Observations
Time :
Date :
Casing Depth: 50
Boring Depth: 63
Water Depth :



Dry, gray fill material

Red-brown, dry dense silty CLAY, some f-m gravel and sand

Dense, dry gray SILT, some f sand, some weathered shale fragments

Gray, dry SILT, some f-c sand and angular gravel, shale fragments

▨ - sample attempt
■ - sample recovered
■ - grain size analysis performed,results tabulated elswhere in report
☐☐ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: ACCURATE
Job No. 2125
Start
Date 8/3/93 Time 0810
Finish
Date 8/4/93 Time 1200

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-15

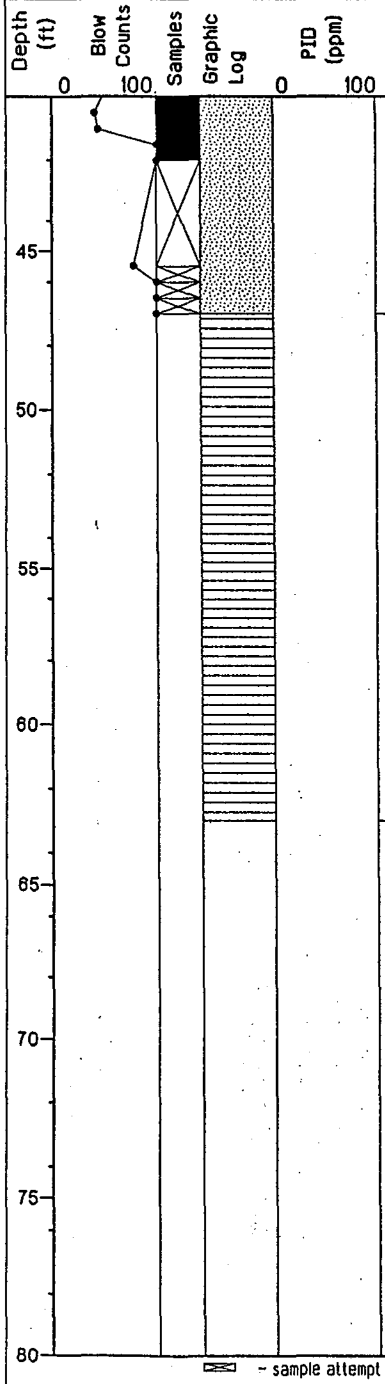
Drilling Company: NORTHSTAR
Driller: JOE
S&W Inspector: S&W--SLG
Drill Rig Type: CME TRUCK RIG
Drilling Method: 4.25"/6.25 i.d. HSA

Weather: HIGH OVERCAST, 70 F

Elevation

X coord: 4943.151 feet
Y coord: 5138.164 feet

Groundwater Observations
Time :
Date :
Casing Depth: 50
Boring Depth: 63
Water Depth :



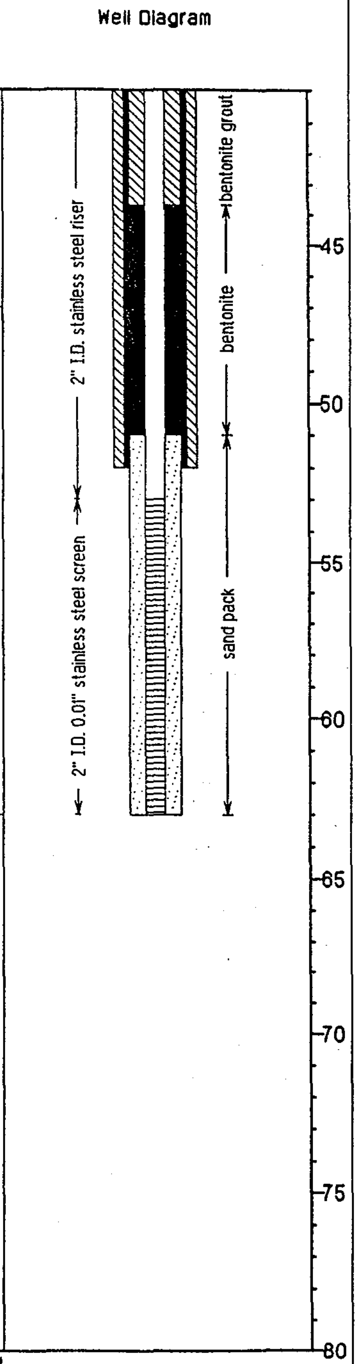
Sample Description

Wet, gray, dense, silty clay, some f sand and f-m gravel

Moist, gray shale bedrock (incompetent)

Gray-green shale bedrock (competent)

Bottom of Boring



⊠ - sample attempt
■ - sample recovered
▣ - grain size analysis performed,results tabulated elswhere in report
☐☐ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: ACCURATE

Job No. 2125

Start
Date 8/5/93 Time 0700
Finish
Date 8/7/93 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-16

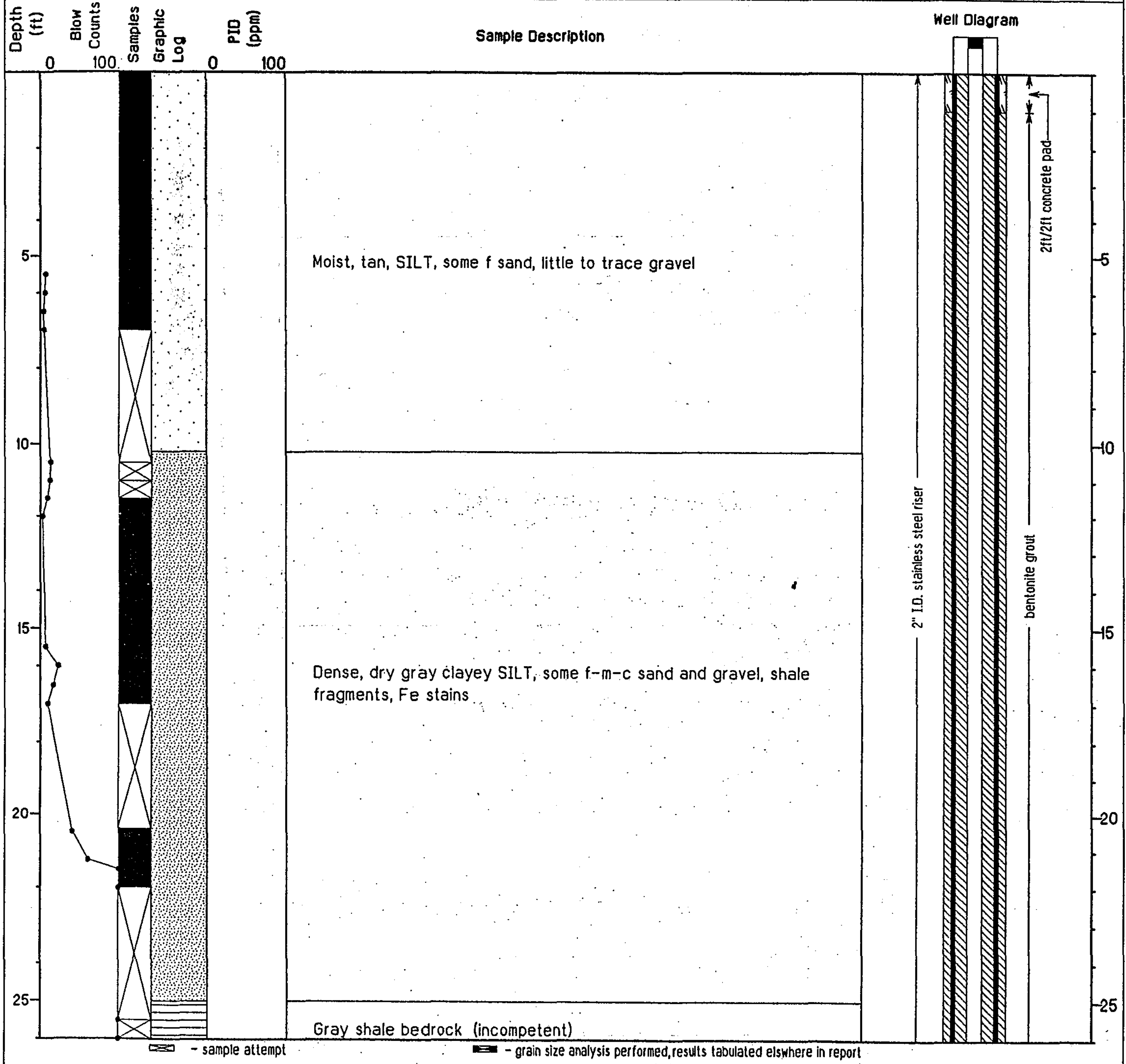
Drilling Company: NORTHSTAR
Driller: JOE ELY
S&W Inspector: S&W--SLG
Drill Rig Type: CME TRUCK RIG
Drilling Method: 4.25" i.d. HSA

Weather: PARTLY SUNNY, 75 F

Elevation

X coord: 4943.151 feet
Y coord: 5138.164 feet

Groundwater Observations
Time :
Date :
Casing Depth: 33.5
Boring Depth: 47.8
Water Depth :



Moist, tan, SILT, some f sand, little to trace gravel

Dense, dry gray clayey SILT, some f-m-c sand and gravel, shale fragments, Fe stains

Gray shale bedrock (incompetent)

⊠ - sample attempt
■ - sample recovered
■ - grain size analysis performed, results tabulated elswhere in report
☐☐ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Project Name: ACCURATE

Job No. 2125

Start
Date 8/5/93 Time 0700
Finish
Date 8/7/93 Time

Stearns and Wheler

Environmental
Engineers and Scientists

Boring ID: MW-16

Drilling Company: NORTHSTAR

Driller: JOE ELY

S&W Inspector: S&W--SLG

Drill Rig Type: CME TRUCK RIG

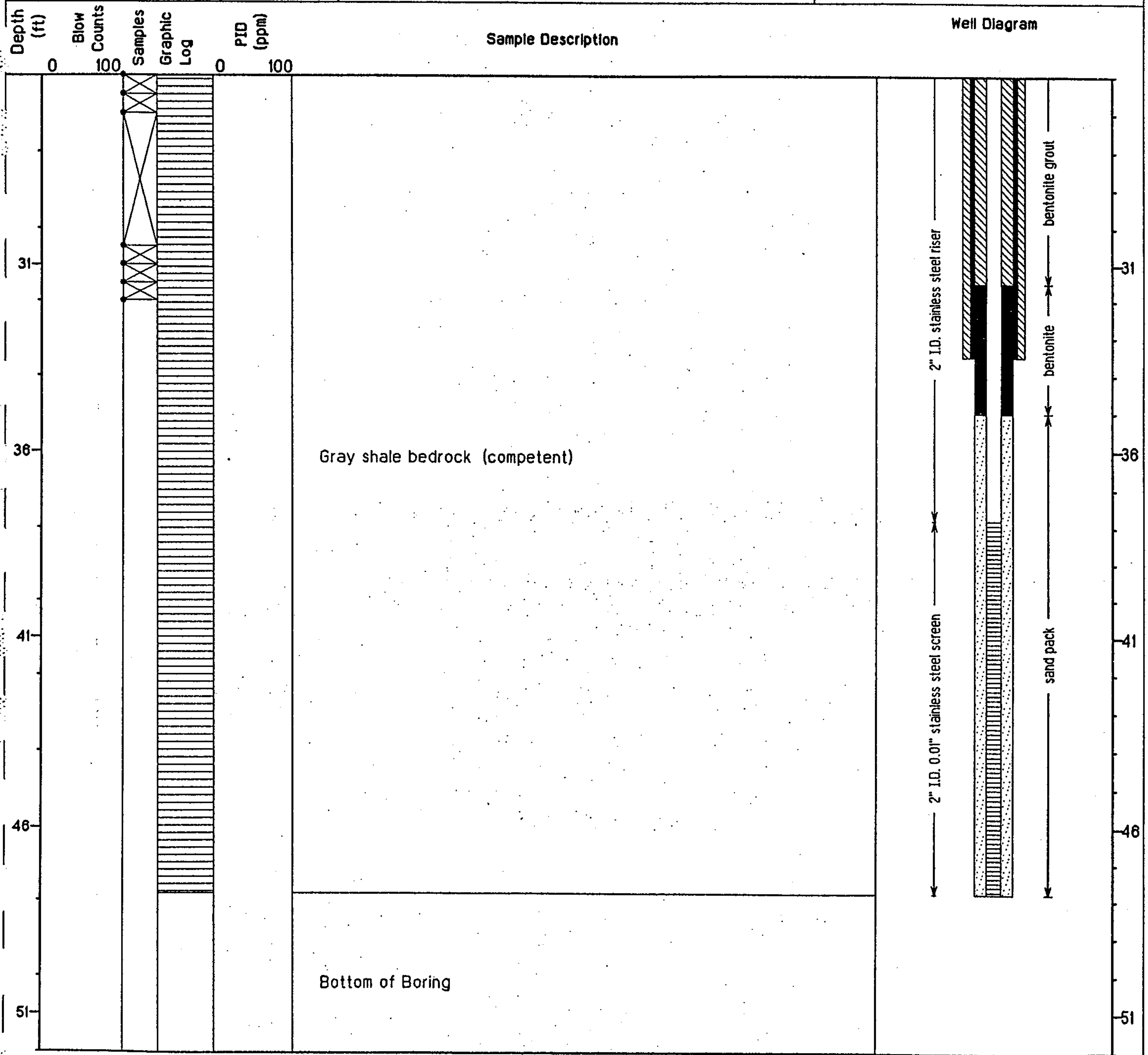
Drilling Method: 4.25" i.d. HSA

Weather: PARTLY SUNNY, 75 F

Elevation

X coord: 4943.151 feet
Y coord: 5138.164 feet

Groundwater Observations
Time :
Date :
Casing Depth: 33.5
Boring Depth: 47.8
Water Depth :



Gray shale bedrock (competent)

Bottom of Boring

⊠ - sample attempt

■ - sample recovered

▬ - grain size analysis performed,results tabulated elswhere in report

☐☐ - core attempt

Descriptions in log have been generalized for clarity of presentation. Significant changes in lithology have been noted. Original well logs are available from Stearns and Wheler files.

Stearns and Wheler

Engineers and Scientists

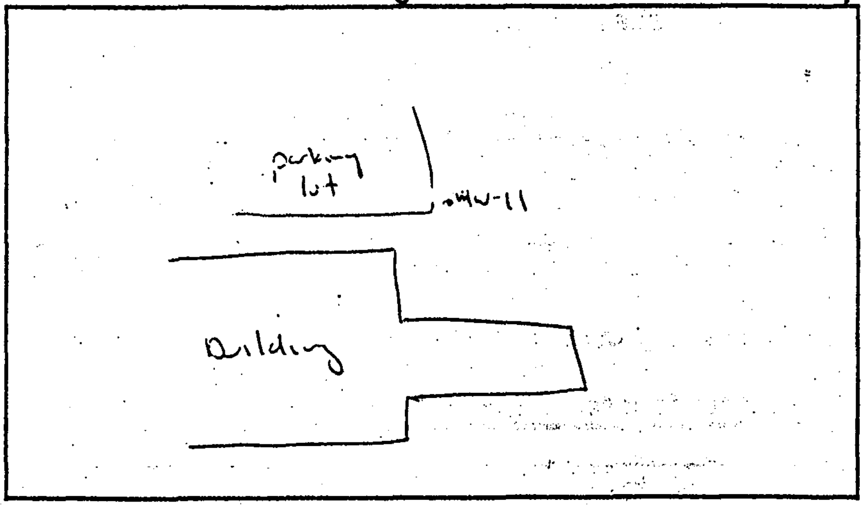
Environmental Science Group
Daily Field Report

Date: 5/6/92 Job #: 2125
Time: (arrive) 10 Am (depart) 4 PM
Location: Accurate Die
Activity: Drilling
Filed by: Thomas R Byrnes
Signature:

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Decon of drill rig + equipment prior to starting work
Drilled + sampled MW-11 to 16'
Set 5" casing to 16' and grouted in place

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

Decon - 10-12, 3:45-4:15 - 2½ hrs total
Drill rig - 6¼" augers - 16' 6 split spoons
17'8' of 5 inch steel casing
Driller + helper

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: —
Skies: cloudy
Air Temperature: 50's
Wind (direction and speed): —
Ground Moisture: dry

6. Were there any visitors to the site? YES NO

Name	**Company**
	Environ. Products

7. Were any photographs taken by company representatives? [✓ YES] NO

Please detail location and decsription:
Several shots of MW-11
Picture of seep by Bishops Brook

8. Additional Comments

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler
Engineers and Scientists

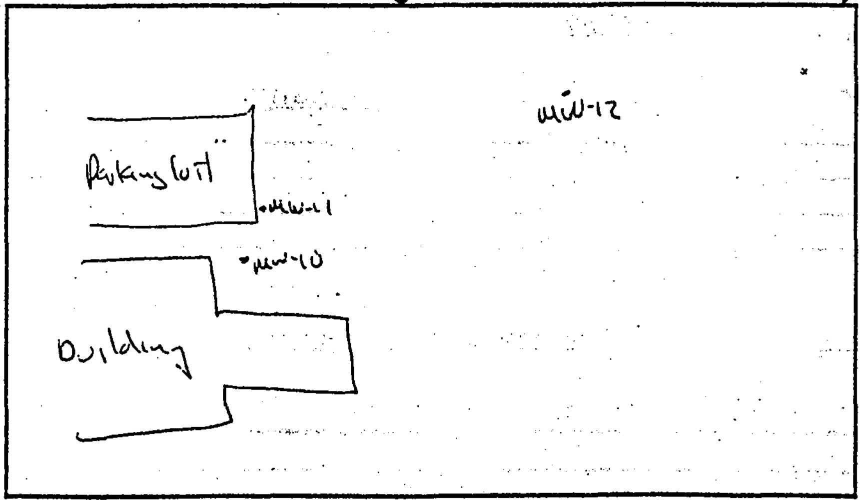
Environmental Science Group
Daily Field Report

Date: 5/7/92 Job #: 212544
Time: (arrive) 7:30 A (depart) 3 PM
Location: Accurate Die Casting
Activity: Drilling
Filed by: Thomas R Byrnes
Signature:

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Drilled MW-10 to 18', set and grouted 5" casing to 18' in dense till.
Decon of drilling tools + stainless steel well materials
Cleared location for MW-12
Set up rig on MW-12

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

Decon 12:05 - 1:50 - 1 3/4 hrs
Clearing 2:30 - ? (3:30)
Drilled 6 1/4" HSA to 18' 7 split spoons to 20'
20' of 5" steel casing used (2' stickup)

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: —
Skies: Sunny
Air Temperature: 60's
Wind (direction and speed): light - variable
Ground Moisture: dry

6. Were there any visitors to the site? YES NO

Name	Company
Vivek Nattanmai	NYSDEC

7. Were any photographs taken by company representatives? [✓ YES] NO

Please detail location and decsription:
Rig set up on MW-10

8. Additional Comments

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler
Engineers and Scientists

Environmental Science Group
Daily Field Report

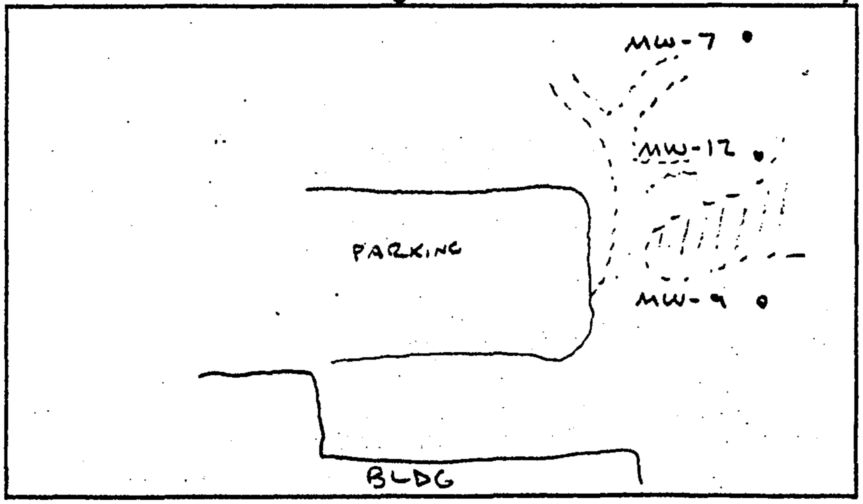
Date: 5/8/92 Job #: 2125
Time: (arrive) 8:05 (depart)
Location: ACCURATE DIE CASTING
Activity: DRILLING
Filed by: L. HINELINE
Signature:

---

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Augered boring for MW-12

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

NORTHSTAR DRILLING HARRY & RICK
L. HINELINE - SUPERVISOR FOR STEARNS & WHELER

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: NONE
Skies: OVERCAST EARLY TO PARTLY CLOUDY LATER
Air Temperature: 40s IN AM 60s LATER
Wind (direction and speed):
Ground Moisture: DRY

6. Were there any visitors to the site? [✓ YES] NO

Name	Company
MIKE DIPIETRO	NYSDEC - DIV OF HAZ SITE REMED. GEOLOGIST THAT WORKS W/ VIVEK

7. Were any photographs taken by company representatives? YES NO

Please detail location and decsription:

8. Additional Comments
collect sample MW17SSS from S-5 & S-6
sent to NYTEST

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler

Engineers and Scientists

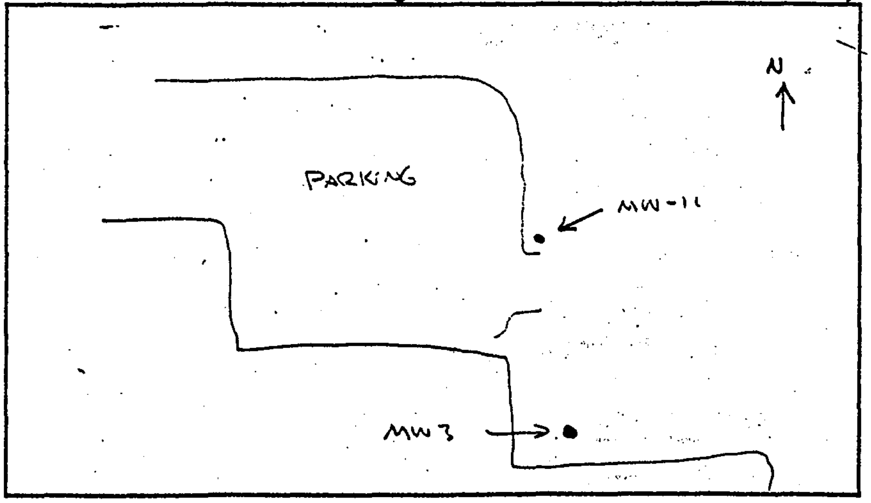
Environmental Science Group
Daily Field Report

Date: 5/11/92 Job #: 2125
Time: (arrive) 9:15 (depart) 4:00PM
Location: ACCURATE DIE CASTING
Activity: DRILLING
Filed by: TL. HINELINE
Signature:

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Resumed drilling on MW-11. On 5/6/92 surface casing was set to 16 ft. Today's plan - set casing into top of rock.
Continuous sample to 37.5 w/ mud rotary drilling confirm bedrock @ 37.5. Drill to 39.5 to set 4" steel casing. 4" casing wouldn't go in. hung up @ bottom of 5". Harry will get larger bit to ream out hole - tomorrow.

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

TRBurner met drillers - then got water & set up. TLH arrived at 9.15. Harry, Rich & CME 55 drilling equip

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: none
Skies: clear
Air Temperature: 70's
Wind (direction and speed): NONE
Ground Moisture: dry

6. Were there any visitors to the site? YES NO

Name	**Company**
VIVEK NATTENMAI	NYSDEC PROJECT MGR

7. Were any photographs taken by company representatives? YES [✓ NO]

Please detail location and decsription:

8. Additional Comments

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler

Engineers and Scientists

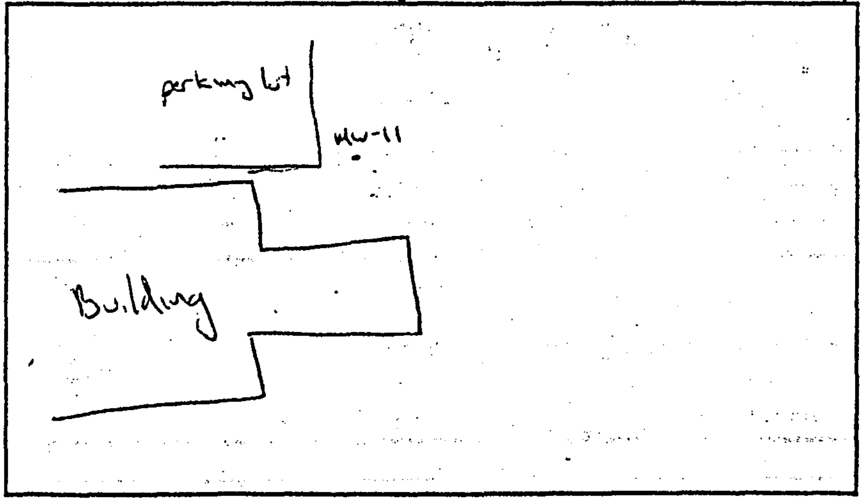
Environmental Science Group
Daily Field Report

Date: 5/12/92 Job #: 2125
Time: (arrive) 11:30 A (depart) 1:10 PM
Location: Accurate Die Casting
Activity: Drilling oversight
Filed by: Thomas R Byrnes
Signature:

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Reaming out MW-11 to 39' to set 4" casing into bedrock

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

Northstar Drill Rig - 2 people water for drilling

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: Sunny
Skies:
Air Temperature: 70's
Wind (direction and speed): light
Ground Moisture:

6. Were there any visitors to the site? YES [✓ NO]

Name	**Company**

7. Were any photographs taken by company representatives? YES [✓ NO]

Please detail location and decsription:

8. Additional Comments

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler

Engineers and Scientists

Environmental Science Group
Daily Field Report

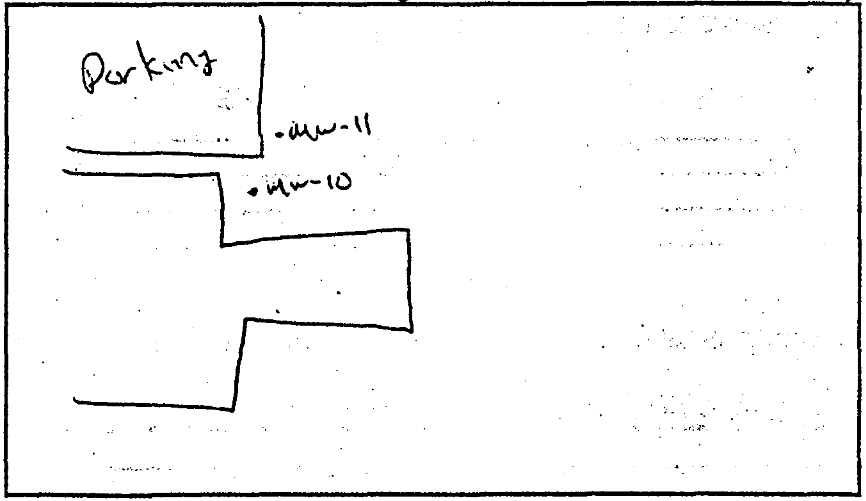
Date: 5/13/92 Job #: 2125
Time: (arrive) 8 AM (depart) 12:20
Location: Accurate Die
Activity: Drilling oversight
Filed by: Thomas R Byrnes
Signature:

---

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Drilling and Sampling at MW-10 through 5" Casing from 20' to 44' - Setting and grouting of 4 inch casing to 44'

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

Drillers - Rig + two people
11 split spoon samples
PID
Soil Sample MW-10 24.5-26 submitted for analysis
Soil Sample Duplicates from MW-10 27.5-31.8 submitted for analysis
~46' 4" steel casing - welded together on site

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation:
Skies: Sunny
Air Temperature: 70's
Wind (direction and speed): light
Ground Moisture:

6. Were there any visitors to the site? YES [✓ NO]

Name	**Company**

7. Were any photographs taken by company representatives? YES [✓ NO]

Please detail location and decsription:

8. Additional Comments

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler

Engineers and Scientists

Environmental Science Group
Daily Field Report

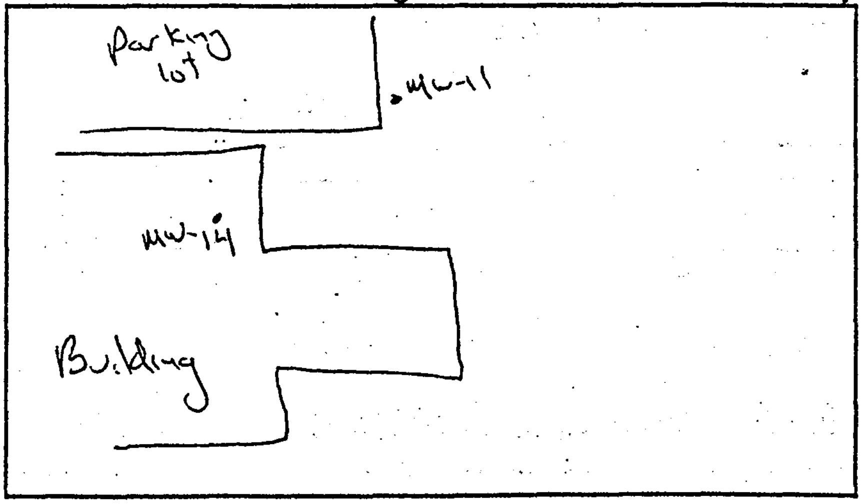
Date: 5/14/92 Job #: 2125
Time: (arrive) 8AM (depart) 7:30P
Location: Accurate Die
Activity: Drilling oversight
Filed by: Thomas R Byrnes
Signature:

---

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Bedrock Coring and well construction of MW-11
Drilling and construction of MW-14

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

Driller - Rig & two people
PID
Rock Core MW-11 40-49'
Set MW-11 to 48', screen to 42.7
MW-14 - 13 split spoon samples
Soil Sample SS-9 for MS, MSD TCL Metals 4'-6'
" " SS-9 for MS, MSD TCL Volatiles 6'-8'
MW-14 set to 24' screen to 13.2' (10' open area)

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents [✓ Other] None

Describe:
Well MW-14 apparently dry to 24'

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation:
Skies: Cloudy
Air Temperature: 60s
Wind (direction and speed):
Ground Moisture:

6. Were there any visitors to the site? YES [✓ NO]

Name	**Company**

7. Were any photographs taken by company representatives? [✓ YES] [✓ NO]

Please detail location and decsription:
Photos of bedrock cores

8. Additional Comments

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler

Engineers and Scientists

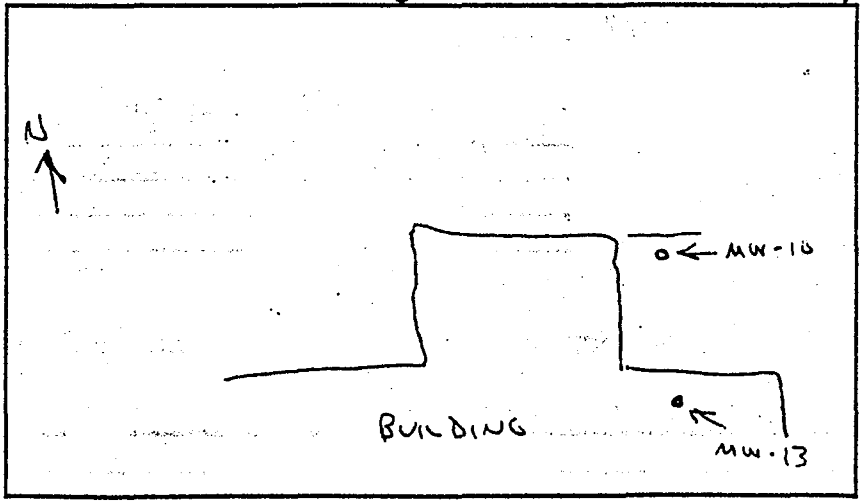
Environmental Science Group
Daily Field Report

Date: 5/15/92 Job #: 2125
Time: (arrive) TRB 7:30 (depart) 9:30
TLH 930 > 12
2 →
Location: ACCURATE
Activity: COMPLETE MW-13 & MW-10
Filed by: TLH
Signature:

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Drilling was begun on MW-13 inside building. Advanced to 21 feet - screened 11-21. No indication of contamination trace of water @ 18'. Check MW-11. Dry. Complete MW-13 Rig down, fence replaced, decon, got water, rig up on MW-10

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

TR Burnett - 730-930, TL Hamelin 930-12, 2 - Harry & Rich w/ Northstar drilling. Interior drilling w/ low clearance skid.

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: NONE
Skies: PARTLY CLOUDY
Air Temperature: 60s
Wind (direction and speed):
Ground Moisture: DRY

6. Were there any visitors to the site? [✓ YES] NO

Name	Company
GREG DRUM	S&W - delivering table & chairs for work inside

7. Were any photographs taken by company representatives? YES [✓ NO]

Please detail location and decsription:

8. Additional Comments
[illegible] covering overhead door was reattached to building after MW-13 was completed.

Please attach additional pages and copies of field notes to this sheet, and send to file!

1LM

Stearns and Wheler

Engineers and Scientists

Environmental Science Group
Daily Field Report

Date: 5-28-92 Job #: 2125
Time: (arrive) 7AM (depart) 1:45pm
Location: Accurate Die Casting
Activity: Septic System Sampling (+ water levels
Filed by: GWD
Signature: G Dunn

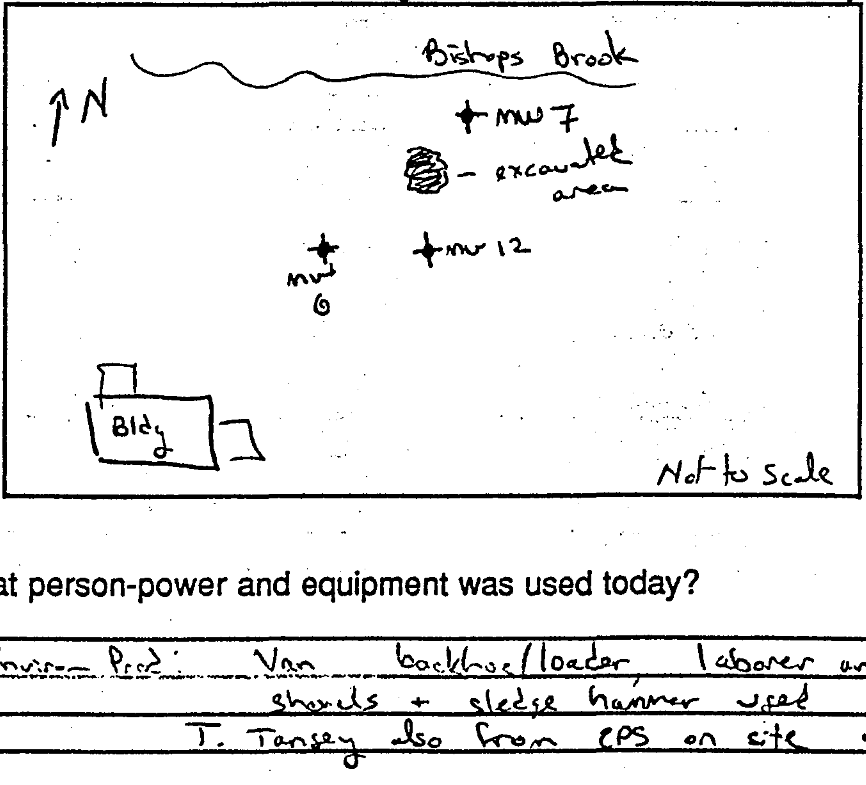
1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Environ Prod + Srvcs excavated down to septic tank; punched hole into tank to allow for collection of a sample; sample collected by GWD (solid sample – no liquids present/identified); excavation filled in

GWD also gathered a round of water levels at all monit. wells onsite

(ECM on site w/ Henri Hammel of DOH)

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

Environ Prod: Van backhoe/loader, laborer and operator
shovels + sledge hammer used
T. Tansey also from EPS on site @ no charge/cost

GWD used water level indicator for water levels

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: none
Skies: 80% Sunny 20% some cloud
Air Temperature: 45°F 7am 60°F noon
Wind (direction and speed): varied ~ 5 mph
Ground Moisture: medium dry (heavy dew in am)

6. Were there any visitors to the site? [✓ YES] NO

Name	**Company**
Pete Crispo	lives adjacent to site

7. Were any photographs taken by company representatives? [✓ YES] NO

Please detail location and decsription:
photos of various stages of excavation

8. Additional Comments

Referred him to DWS

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler

Engineers and Scientists

Environmental Science Group
Daily Field Report

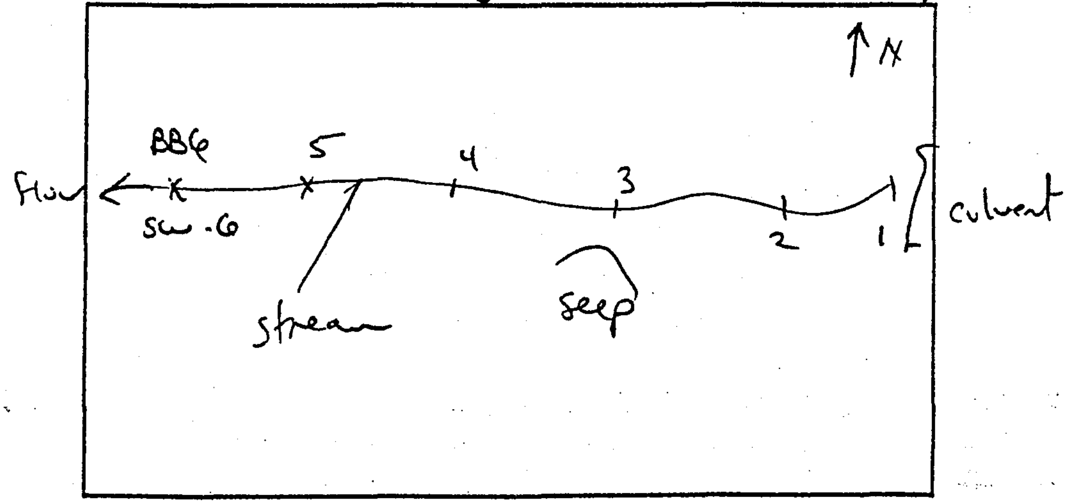
Date: 5-29-92 Job #: 2125
Time: (arrive) 11:30am (depart) 4:00 pm
Location: Accurate Die Casting
Activity: Stream sampling
Filed by: GWD
Signature:

---

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Set of 7 stream samples collected from Bishops Brook and 2 sets of sediment samples; will continue w/ sediments on Monday

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

GWD + disposable gloves

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: Sunny
Skies: Sunny
Air Temperature: 68°F
Wind (direction and speed): varied 5mph
Ground Moisture: medium - dry

6. Were there any visitors to the site? YES [✓ NO]

Name	**Company**

7. Were any photographs taken by company representatives? [✓ YES] NO

Please detail location and decsription:

stream sampling locations

8. Additional Comments

ECM on site 11:30 - 12:00TT - to go over sampling points

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler
Engineers and Scientists

Environmental Science Group
Daily Field Report

Date: 6/2/92 Job #: 2125
Time: (arrive) 7:10 (depart) 3:30
Location: Accurate Die Casting
Activity: Field Sampling
Filed by: (AWS)
Signature: AWS

---

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

MW # 2, 11, 12, 6, 8, 7, 4 sampled for
VOA, T+D metals, alk, Cl⁻, SO₄⁻
(Dup @ MW 6)

Draw a schetch showing the location of site activity.

2. What person-power and equipment was used today?

(AWS) only person on site w/ sampling equip (YSI
turbidimeter, bailers, geopump, etc)

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation: Sunny
Skies: "
Air Temperature: 60°F
Wind (direction and speed): west 0-5 mph
Ground Moisture: damp

6. Were there any visitors to the site? YES [✓ NO]

Name **Company**

7. Were any photographs taken by company representatives? YES [✓ NO]

Please detail location and decsription:

8. Additional Comments

purge water fr MW 6+11 placed in
55 gal drum inside bldg

Please attach additional pages and copies of field notes to this sheet, and send to file!

Stearns and Wheler

Engineers and Scientists

Environmental Science Group
Daily Field Report

Date: 6-4-92 Job #: 2125
Time: (arrive) 7:45 (depart) 4:30
Location: Accurate Die Casting
Activity: sampling
Filed by: GWD
Signature:

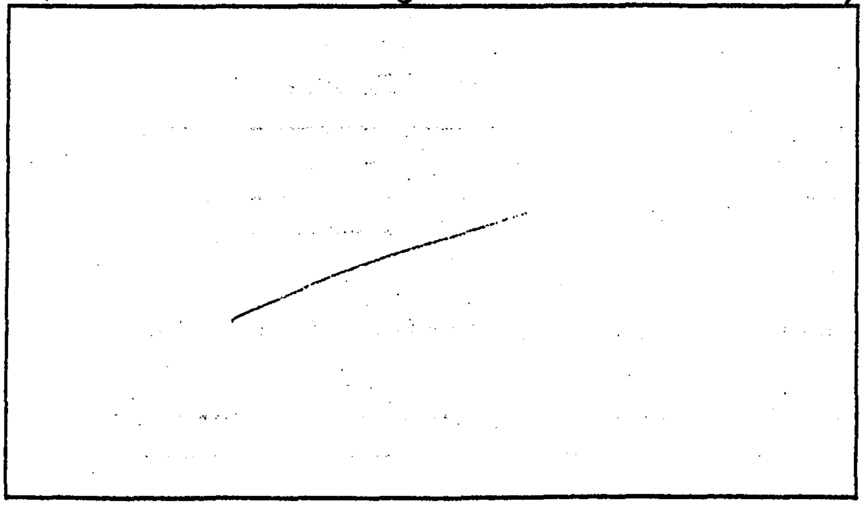
---

1. What significant work was accomplished today? Specifically locate work by street name, building name, sample number and monitor well number.

Finished sediment sampling in Bishops Brook (BB-4, 3, 2, 1)

Finished sampling MW's (3, 5, 9 + 10)

Draw a schetch showing the location of site activity.



2. What person-power and equipment was used today?

(GWD) w/ sampling equip (YSI, bailers, turbid—, geopump etc)
(respirator, tyvek, gloves ---)

3. What unusual event happened today?
Equipment failure Unexpected Findings Accidents Other [✓ None]

Describe:

4. Was any property damaged? YES [✓ NO]

Explain:

5. What were the weather conditions at the site?

Precipitation:
Skies: SUNNY
Air Temperature: 75°F
Wind (direction and speed): 0-5 mph west
Ground Moisture: dry

6. Were there any visitors to the site? YES [✓ NO]

Name	Company

7. Were any photographs taken by company representatives? YES [✓ NO]

Please detail location and decsription:

8. Additional Comments

TCE odor noted @ MW-3, PID read up to 80ppm over purge water

Please attach additional pages and copies of field notes to this sheet, and send to file!

APPENDIX C

SLUG TEST CALCULATIONS

Hydraulic Conductivity Calculations using the Bouwer and Rice Method

JOB NAME:	Accurate	**JOB #:**	2125
SITE:	Accurate		
TEST DATE:	6/26/92	WELL:Mw-11	
TEST TYPE:	Slug		

file: autoslug.wk3 revised 12/31/91 by KS

DATA

Equilibrium head 4.24 (ft below top of casing)

change time (secs)	actual head (feet)	head change	(h-h)/ Ho	log head change	best fit
	4.24	(pre-slug head)			
0	5.47	-1.23	1.000	0.089	-0.450
1	5.37	-1.12	0.914	0.050	-0.453
2	5.29	-1.05	0.856	0.021	-0.456
3	5.22	-0.98	0.799	-0.009	-0.458
4	5.17	-0.93	0.755	-0.033	-0.461
5	5.13	-0.88	0.719	-0.055	-0.464
6	5.09	-0.84	0.685	-0.075	-0.467
7	5.05	-0.80	0.654	-0.095	-0.470
8	5.02	-0.77	0.628	-0.113	-0.473
9	4.98	-0.74	0.603	-0.131	-0.475
10	4.96	-0.71	0.582	-0.146	-0.478
11	4.93	-0.69	0.559	-0.164	-0.481
12	4.91	-0.66	0.539	-0.180	-0.484
13	4.88	-0.64	0.520	-0.195	-0.487
14	4.86	-0.62	0.502	-0.210	-0.490
19	4.77	-0.53	0.430	-0.277	-0.504
24	4.70	-0.46	0.373	-0.339	-0.518
29	4.65	-0.41	0.333	-0.389	-0.532
34	4.61	-0.37	0.298	-0.437	-0.546
39	4.58	-0.33	0.271	-0.479	-0.561
44	4.55	-0.30	0.247	-0.519	-0.575
49	4.52	-0.28	0.227	-0.556	-0.589
54	4.50	-0.26	0.209	-0.592	-0.603
59	4.48	-0.24	0.193	-0.625	-0.617
64	4.47	-0.22	0.180	-0.656	-0.632
69	4.45	-0.20	0.167	-0.688	-0.646
74	4.44	-0.20	0.160	-0.708	-0.660
79	4.43	-0.18	0.149	-0.738	-0.674
84	4.42	-0.17	0.142	-0.759	-0.688
89	4.41	-0.16	0.134	-0.785	-0.703
94	4.40	-0.16	0.129	-0.801	-0.717
99	4.39	-0.15	0.121	-0.830	-0.731
104	4.39	-0.14	0.116	-0.848	-0.745
109	4.38	-0.14	0.111	-0.866	-0.759
114	4.37	-0.13	0.105	-0.889	-0.773
144	4.35	-0.11	0.087	-0.971	-0.859
174	4.34	-0.09	0.074	-1.041	-0.944
204	4.32	-0.08	0.064	-1.102	-1.029
234	4.31	-0.07	0.054	-1.180	-1.114
264	4.31	-0.06	0.051	-1.201	-1.199
294	4.30	-0.06	0.049	-1.222	-1.284
324	4.30	-0.06	0.046	-1.252	-1.369
354	4.30	-0.05	0.043	-1.276	-1.455
384	4.29	-0.05	0.038	-1.328	-1.540
414	4.29	-0.05	0.038	-1.328	-1.625
444	4.29	-0.04	0.036	-1.357	-1.710
474	4.28	-0.04	0.030	-1.432	-1.795
504	4.28	-0.04	0.030	-1.432	-1.880
534	4.28	-0.04	0.030	-1.432	-1.965
564	4.28	-0.03	0.028	-1.469	-2.051
594	4.28	-0.03	0.028	-1.469	-2.136
714	4.28	-0.03	0.025	-1.509	-2.476
834	4.27	-0.03	0.023	-1.553	-2.817
954	4.28	-0.03	0.025	-1.509	-3.157
1074	4.27	-0.03	0.023	-1.553	-3.498
1194	4.27	-0.03	0.023	-1.553	-3.838
1314	4.27	-0.03	0.023	-1.553	-4.179
1434	4.27	-0.02	0.018	-1.658	-4.519

WELL CHARACTERISTICS

Well Radius,Rc=	1.00	in
Boring Radius,Rw=	2.00	in
Water Level above well bottom,Lw=	17.90	ft
Saturated Screen Thick.,Le=	5.00	ft
Saturated Aquifer Thick., H=	17.90	ft

••

Regression OutpRegression Output:

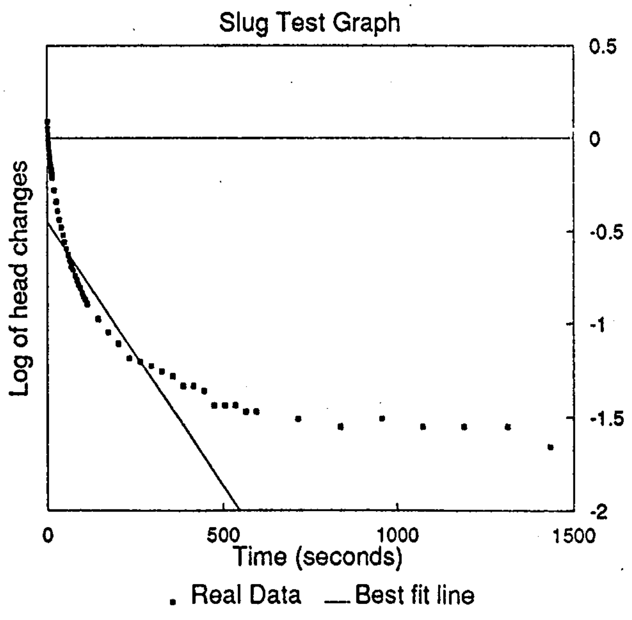
Constant		-0.450
Std Err of Y Est		0.104
R Squared		0.875
No. of Observations		28
Degrees of Freedom		26
X Coefficient(s)	-0.00284	
Std Err of Coef.	0.00021	

••

BOUWER/RICE			Req=	2.54 cm
SLUG TEST CALCULATIONS			Rw=	5.08 cm
			Le=	152.40 cm
From Fig.2,			Lw=	545.59 cm
Bouwer&Rice,1989:			H=	545.59 cm
	A=	2.40	Le/Rw=	30
	B=	0.35	Yo=	0.35
	C=	2.00	Yt=	0.34
			t=	5.00
			ln(Re/Rw)=	3.31

K=((Req^2)*ln(Re/Rw)/2Le)*(1/t*ln(Yo/Yt))

K (cm/s)= 4.6E-04



spreadsheet developed from:
Bouwer, H. 1989. "The Bouwer and Rice Slug Test - An Update", Ground Water, Vol. 27, No.3, pp.304-309.

The data table may be cropped for convenience of presentation. Entire data set appears on graph.

Hydraulic Conductivity Calculations using the Bouwer and Rice Method

JOB NAME: Accurate
SITE: Accurate
JOB #: 2125

TEST DATE: 6/26/92
TEST TYPE: Slug

WELL:MW-12

file: autoslug.wk3 revised 12/31/91 by KS

DATA

Equilibrium head 5.33 (ft below top of casing)

change time (secs)	actual head (feet)	head change	(h-h)/ Ho	log head change	best fit
	5.33	(pre-slug head)			
0	6.73	-1.39	1.000	0.144	-0.009
1	6.50	-1.16	0.834	0.065	-0.054
2	6.33	-1.00	0.716	-0.001	-0.099
3	6.20	-0.86	0.621	-0.063	-0.144
4	6.08	-0.75	0.537	-0.127	-0.190
5	5.98	-0.65	0.466	-0.188	-0.235
6	5.89	-0.56	0.402	-0.252	-0.280
7	5.82	-0.49	0.350	-0.312	-0.325
8	5.76	-0.43	0.307	-0.370	-0.370
9	5.70	-0.37	0.264	-0.435	-0.415
10	5.66	-0.32	0.232	-0.491	-0.460
11	5.61	-0.28	0.200	-0.554	-0.505
12	5.58	-0.25	0.180	-0.602	-0.550
13	5.55	-0.22	0.157	-0.660	-0.596
14	5.52	-0.19	0.136	-0.721	-0.641
15	5.50	-0.17	0.121	-0.775	-0.686
16	5.49	-0.15	0.109	-0.818	-0.731
21	5.42	-0.08	0.060	-1.081	-0.956
26	5.38	-0.05	0.034	-1.319	-1.182
31	5.36	-0.03	0.021	-1.538	-1.408
36	5.35	-0.02	0.014	-1.721	-1.633
41	5.35	-0.01	0.009	-1.886	-1.859
46	5.34	-0.01	0.007	-2.000	-2.084
51	5.34	-0.01	0.005	-2.155	-2.310
56	5.34	-0.00	0.003	-2.398	-2.536
61	5.34	-0.00	0.003	-2.398	-2.761
66	5.34	-0.00	0.003	-2.398	-2.987
71	5.34	-0.00	0.003	-2.398	-3.212
76	5.34	-0.00	0.003	-2.398	-3.438
81	5.34	-0.00	0.003	-2.398	-3.663
86	5.34	-0.00	0.003	-2.398	-3.889
91	5.34	-0.00	0.003	-2.398	-4.115
96	5.34	-0.00	0.003	-2.398	-4.340
101	5.34	-0.00	0.003	-2.398	-4.566
106	5.34	-0.00	0.003	-2.398	-4.792
111	5.34	-0.00	0.003	-2.398	-5.017

WELL CHARACTERISTICS

Well Radius,Rc=	1.00	in
Boring Radius,Rw=	2.00	in
Water Level above well bottom,Lw=	5.60	ft
Saturated Screen Thick.,Le=	5.60	ft
Saturated Aquifer Thick., H=	5.60	ft

••

Regression OutpRegression Output:

Constant		-0.009
Std Err of Y Est		0.094
R Squared		0.985
No. of Observations		25
Degrees of Freedom		23
X Coefficient(s)	-0.04512	
Std Err of Coef.	0.00116	

••

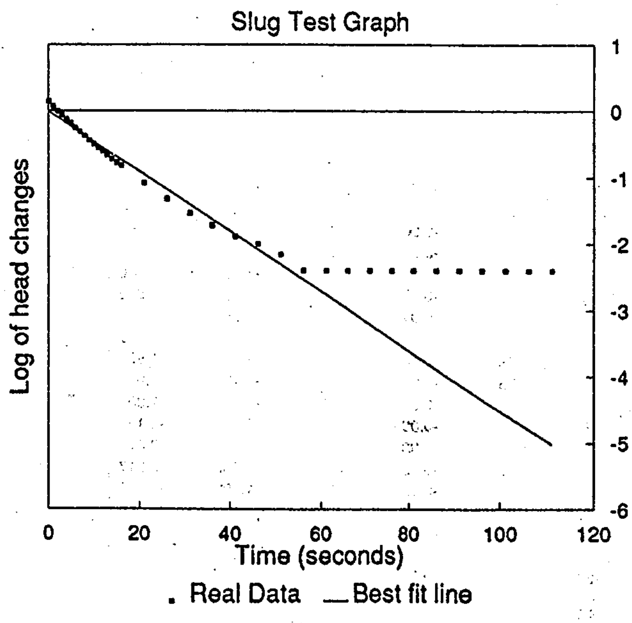
BOUWER/RICE
SLUG TEST CALCULATIONS

From Fig.2,
Bouwer&Rice,1989:

		Req=	3.50	cm
		Rw=	5.08	cm
		Le=	170.69	cm
		Lw=	170.69	cm
		H=	170.69	cm
A=	2.40	Le/Rw=	34	
B=	0.35	Yo=	0.98	
C=	2.00	Yt=	0.58	
		t=	5.00	
		ln(Re/Rw)=	2.68	

K=((Req^2)*ln(Re/Rw)/2Le)*(1/t*ln(Yo/Yt))

K (cm/s)= 1.0E-02



spreadsheet developed from:
Bouwer, H. 1989. "The Bouwer and Rice Slug Test - An Update", Ground Water, Vol. 27, No.3, pp.304-309.

The data table may be cropped for convenience of presentation. Entire data set appears on graph.

APPENDIX D

CHAIN-OF-CUSTODY FORMS

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

NEI nytest environmental inc

CHAIN OF CUSTODY RECORD

Page 1 of 1

SHIP TO: Nytest Environmental Inc.
60 Seaview Blvd.
Port Washington, NY 11050
(516) 625-5500
Attn. Sample Custodian

REPORT TO: Client Name Stearns & Wheler
Address 1 Remington Park Dr
Cazenovia NY 13035
Phone 315-655-8161
Attn. Dr Liz Moran

Project No. 2125	Project Name Stearns & Wheler	Date Shipped 5/13/92	Carrier
Sampler: (Signature)	Analytical Protocol ASP	Air Bill No.	Cooler No.

Sample I.D.	Date/Time Sampled		Sample Description	No. Of Con-tainers	ANALYSIS REQUESTED
SS-3	5/11/92	12	MW-11 30'-32'	3	VOC (TCL), Metals (TCL)
SS-1	5/13/92	9A	MW-10 24.5'-26'	3	VOC (TCL), Metals (TCL)
SS-2	5/13/92	10A	MW-10 27.5-318	3	VOC (TCL), Metals (TCL)
SS-11	5/13/92	-	Duplicate	3	VOC (TCL), Metals (TCL)

Relinquished by (Signature) Print Name Thomas R Byrnes	5/13/92	5 PM	Rec'd. By (Signature) Print Name		
Relinquished by (Signature) Print Name	Date	Time	Rec'd by (Signature) Print Name	Date	Time
Relinquished by (Signature) Print Name	Date	Time	Received for Laboratory by (Signature) Print Name Pierides	5/14	1030 AM

Special Instructions/Comments

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
1255001	SS-9	Soil
1255002	SS-9MS	Soil
1255003	SS-9MSD	Soil
1255004	SS-10	Soil
1255005	SS-7	Soil

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

NEI nytest environmental inc

CHAIN OF CUSTODY RECORD

Page 1 of 1

SHIP TO: Nytest Environmental Inc.
60 Seaview Blvd.
Port Washington, NY 11050
(516) 625-5500
Attn. Sample Custodian

REPORT TO: Client Name Stearns + Wheler
Address 1 Remington Park Dr
Cazenovia NY 13035
Phone 315-655-8161
Attn Dr Liz Moran

Project No. 2125	Project Name Stearns + Wheler	Date Shipped	Carrier
Sampler: (Signature)	Analytical Protocol ASP	Air Bill No.	Cooler No.

Sample I.D.	Date/Time Sampled		Sample Description	No. Of Containers	ANALYSIS REQUESTED
SS-9	5/14/92	4P	MW-14 4'-8'	3	TCL Metals + Volatiles
SS-9 MS	5/14/92	4P	MW-14 4'-8'	3	TCL Metals + Volatiles
SS-9 MSD	5/14/92	4P	MW-14 4'-8'	3	TCL Metals + Volatiles
SS-10	5/14/92	5P	MW-14 25-26.5	3	TCL Metals + Volatiles
SS-7	5/15/92	1030 A	MW 13 17.5-19.5	3	TCL METALS & VOLATILES

Relinquished by (Signature) Print Name T. HINELINE	Date 5/15/92	Time 5pm	Rec'd. By (Signature) Print Name	Date	Time
Relinquished by (Signature) Print Name	Date	Time	Rec'd. by (Signature) Print Name	Date	Time
Relinquished by (Signature) Print Name	Date	Time	Received for Laboratory by (Signature) P Shah Print Name Parag Shah	Date 5/16	Time 11:45

Special Instructions/Comments

Client Retains Yellow Copy Only

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
1269901	SW-1	Water
1269902	SW-2	Water
1269903	SW-3	Water
1269904	SW-3MS	Water
1269905	SW-3MSD	Water
1269906	SW-4	Water
1269907	SW-5	Water
1269908	SW-6	Water
1269909	SW-7	Water
1269910	DUP	Water
1269911	ST-1	Soil
1269912	BB-6A	Miscell.
1269913	BB-6B	Miscell.
1269914	BB-6C	Miscell.
1269915	BB-5A	Miscell.
1269916	BB-5B	Miscell.
1269917	TRIP BLK	Water

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc

CHAIN OF CUSTODY RECORD

Page 1 of 2

SHIP TO: Nytest Environmental Inc.
60 Seaview Blvd.
Port Washington, NY 11050
(516) 625-5500
Attn. Sample Custodian

REPORT TO: Client Name S+W
Address One Remington Pk Dr
[illegible] NY [illegible]
Phone 315/655-8161
Attn. Liz Moran

Project No.	Project Name ADC	Date Shipped	Carrier
Sampler: (Signature) GWD	Analytical Protocol NYSDEC ASP 12/91	Air Bill No.	Cooler No. 108

Sample I.D.	Date/Time Sampled		Sample Description	No. Of Con-tainers	ANALYSIS REQUESTED	
SW-1	5/29/92	13:15	aqueous	3	VOC /	metals
SW-2	"	13:00	"	3	"	"
SW-3	"	12:40	"	3	"	"
SW-3MS	"	"	"	3	"	"
SW 3MSD	"	"	"	3	"	"
SW-4	"	12:35	"	3	"	"
SW-5	"	12:30	"	3	"	"
SW-6	"	12:15	"	3	"	"
SW-7	"	12:50	"	3	"	
DUP	"	—	aqueous	3	"	"
Trip Blank			"	4	VOC (NB)	

Relinquished by (Signature) GW Drumm	Date / Time 5/28/92	9Am	Rec'd. By (Signature) Same	Date / Time	
Print Name Greg Drumm			Print Name		
Relinquished by (Signature) GW Drumm to FED EX	Date / Time 5/29/92	17:00	Rec'd. by (Signature) TO FED EX	Date / Time	
Print Name			Print Name		
Relinquished by (Signature)	Date / Time		Received for Laboratory by (Signature)	Date / Time 5/30	10:30 AM
Print Name			Print Name Pier Plerds		

Special Instructions/Comments

Client Retains Yellow Copy Only

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

NEI nytest environmental inc

CHAIN OF CUSTODY RECORD

Page 2 of 2

SHIP TO: Nytest Environmental Inc.
60 Seaview Blvd.
Port Washington, NY 11050
(516) 625-5500
Attn. Sample custodian

REPORT TO: Client Name S+W
Address 1 Remington Pk Dr
Cazenovia NY 13035
Phone 315/655-[illegible]
Attn. Liz Moran

Project No.	Project Name ADC	Date Shipped	Carrier
Sampler: (Signature)	Analytical Protocol NYSDEC ASP 12/91	Air Bill No.	Cooler No. 108

Sample I.D.	Date/Time Sampled		Sample Description	No. Of Containers	ANALYSIS REQUESTED
ST-1	5/25/92	10:45	solid	1	metals / VOA
BB-6A	5/29/92	14:40	sediment	3	metals / VOA / TOC
BB-6B	"	14:45	"	3	" " "
BB-6C	"	15:00	"	3	" " "
BB-5A	"	15:15	"	3	" " "
BB-5B	"	15:20	"	3	" " "

Relinquished by (Signature)	Date / Time		Rec'd. By (Signature)	Date / Time	
GW Dromm Print Name Greg Dromm	5/28/92	9 AM	 Print Name		
GW Dromm Print Name	5/29/92	17:00	TO FEDEX Print Name		
Relinquished by (Signature) Print Name			Received for Laboratory by (Signature) Print Name [illegible]	5/30	10:20 AM

Special Instructions/Comments

00006

Client Retains Yellow Copy Only

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

NEI nytest environmental inc

CHAIN OF CUSTODY RECORD

Page 1 of 1

SHIP TO: Nytest Environmental Inc.
60 Seaview Blvd.
Port Washington, NY 11050
(516) 625-5500
Attn. Sample Custodian

REPORT TO: Client Name Stearns & Wheler
Address One Remington Pk Dr
Cazenovia NY 13035
Phone 315-655-8161
Attn. Liz Moran

Project No.	Project Name ADC	Date Shipped	Carrier
Sampler: (Signature)	Analytical Protocol NYSDEC ASP 12/91	Air Bill No.	Cooler No. 112

Sample I.D.	Date/Time Sampled		Sample Description	No. Of Con-tainers	ANALYSIS REQUESTED		
WB-1	6/4/92	9:30	aqueous	4	metals / TCC / VOA /		
BB-3A MSD	"	8:50	sediment	3	VOA / metals / TCC		
BB-3A MS	"	8:50	"	3	"	"	"
BB-3A	"	"	"	3	"	"	"
BB-3B	"	"	"	3	"	"	"
BB-4A	"	8:00	"	3	"	"	"
BB-4B	"	"	"	3	"	"	"
DUP	—	—	"	3	"	"	"
BB-2A	6/4/92	10:00	"	3	"	"	"
BB-2B	"	10:00	"	3	"	"	"
BB-1A	"	11:00	"	3	"	"	"

Relinquished by (Signature)	Date 6/4/92	Time 18:30	Rec'd By (Signature) FED-EX	Date	Time
Print Name GREG DRUMM			Print Name		
Relinquished by (Signature)	Date	Time	Rec'd. by (Signature)	Date	Time
Print Name			Print Name		
Relinquished by (Signature)	Date	Time	Received for Laboratory by (Signature) Patrick Alvarez	Date 6/6/92	Time 1030
Print Name			Print Name PATRICK ALVAREZ		

Special Instructions/Comments

Client Retains Yellow Copy Only

APPENDIX E

VALIDATION REPORTS

WESTON
MANAGERS DESIGNERS CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

RECEIVED
STEARNS & WHELER
AUG 21 1992

19 August 1992

Elizabeth Moran, Ph.D.
Stearns & Wheler
One Remington Park Drive
Cazenovia, New York 13035

Dear Dr. Moran:

Enclosed are the volatile data validation report for case 12802 and the inorganic data validation report for case 12475. The remaining inorganic data validation report will be sent on August 20, 1992.

WESTON® is sorry for any inconvenience this delay may have caused. If you have any questions or comments, please do not hesitate to contact me at (215) 344-3746.

Very truly yours,

ROY F. WESTON, INC.

Kelly Muir Spittler

Kelly Muir Spittler
Data Validation Unit Leader
WESTON Analytics Division

DATA COMPLIANCE

IROUP #	DATE	CLP YEAR	SAMPLE NO.	MATRIX	COMPLIANCY VOA	BNA	PEST/PCB	METALS	CN	TOTAL PHENOLS	PAGE NO. IN THE CLP	NON-COMPLIANCY
12475 SDG-614	8/17	3/90	Duplicate	Soil	1	NA	NA	2	NA	NA	2(E-137)	
"	"	"	MW1024	"	1	"	"	2	"	"	"	1- Has been submitted. 2- The reported result are qualified J and the detection limits are rejected for AS in all samples due to the spike recovery < 10%. Also the reported IDLs for Se are rejected due to the 0.0% matrix spike recovery. (E137)
"	"	"	MW1027	"	1	"	"	2	"	"	"	
"	"	"	MW1130	"	1	"	"	2	"	"	"	
"	"	"	MW1255	"	1	"	"	2	"	"	"	
"	"	"	SS-10X	"	1	"	"	2	"	"	"	
"	"	"	SS-7XX	"	1	"	"	2	"	"	"	
"	"	"	SS-9XX	"	1	"	"	2	"	"	"	
"												

WESTON
MANAGERS DESIGNERS CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

INORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
CASE 12475
SDG 614

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: 8-18-92
Zohreh Hamid, Ph.D. Date
Section Manager - Data Validation

STERNS & WHEELER
CASE 12475
SDG 614

CASE SUMMARY

This case consisted of eight (8) soil samples received by Nytest Environmental, Inc. (NEI) on 5-9,14,16-92. These samples were analyzed for Target Analyte List according to Contract Laboratory Program SOW 3,90.

All data have been validated with regard to usability according to the quality assurance guidelines set forth by NYSDEC Analytical Services protocol 9,89 (12,91 revisions). If you have any questions or comments on this data review, please contact Zohreh Hamid at (215) 344-3745.

The data are evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
• Calibration
• Laboratory and Field Blanks
• ICP Interference Check Samples
• Matrix Spike/Spike Duplicate
• Laboratory and Field Duplicate
• Laboratory Control Samples
• Furnace Atomic Absorption Results
* • Serial Dilution Samples
* • Detection Limits
* • Overall Sample Results

* All criteria were met for this parameter.

Calibration

The percent recovery for Ag (75.2) was below the requirement limit of 80% on CRDL standard analyzed at the end of the analysis. Since the criteria met the QC limit in the beginning of the analysis, the data are accepted without the qualifier codes. (E-133)

Laboratory and Field Blanks

The calibration blanks contained Fe, and Na at levels above IDL but less than CRDL. The reported results for Fe were above the action level (5x the blank level); therefore, the data are not qualified. The reported results for Na are flagged "U" and is considered as a possible laboratory contamination. (E-134)

The continuing calibration blank and preparation blank contained Sb, Al, Cu and Cd below the negative IDLs. Al was detected in the samples at relatively high concentrations; therefore, the data are accepted unqualified. The reported results ≥IDL for Sb, Cu and Cd are considered to be biased low due to the baseline drift and are flagged J and UJ in the data summary. The field blank was not identified for this batch of sampling.

ICP Interference Check Samples

Positive results were observed for Sb, Ba, Cr, Cu, Mg, V, and Zn in the ICSA solution although there was none of these analytes present in the solution. However since the percent recoveries for all analytes met the ± 20% in the initial and final analyses runs, the data are considered acceptable. (E-135)

Matrix Spike Sample

The matrix spike recoveries for As (1.5%) and Se (0.0%) were significantly below the contract requirement limit. The reported results are considered biased low and the possibility of false negatives exist. Therefore, the results are qualified estimated (J) and the reported detection limits are rejected in the data summary.

Also, the spike recoveries for Sb (43.4%), Pb (62.0%), Mn (286.4%), and Tl (72.0%) were outside the QC limit of 75-125%. The reported data ≥ IDL are qualified estimated in the data summary for Sb, Pb, and Tl. Also, the results for Mn are biased high and the possibility of false positives exist.Therefore, the results are considered estimated. (E-137)

Laboratory and Field Duplicate

The RPD for Pb (28.8%) exceeded CLP requirement limit of 20%. The results are considered estimated due to the poor reproducibility. One field duplicate sample was accompanying the data package. However, the corresponding original sample was not identified; therefore, the validator was unable to verify the field sampling precision. (E-140)

Furnace Atomic Absorption Results

The following samples analyzed by graphite furnace had post digestion spike recoveries outside the acceptable range of 85-115 percent.

SAMPLE ID	ANALYTE	% RECOVERY
MW 1027	Se	83
SS-7XX	Se	69
SS-9XX	Se/Tl	81/83

These analytes were not detected in the corresponding samples. Therefore, the reported detection limits are qualified estimated. (E-144, 13-2.2)

Arsenic in sample MW1255 was analyzed by method of standard addition MSA. The linearity did not meet the requirement limit of "r=0.995" in two different analyses. The reported result in this sample is qualified estimated. Also, the results for lead in sample MW1027 and Arsenic in sample SS-9XXD were reported from MSA analyses. The linearity met the criteria and the reported data are considered representative. (E-145, 13.3.6)

Sample Results

Results less than CRDL and above IDLs are qualified estimated (J) due to uncertainty near the detection limit.

Overall Statements

The data quality was fair. The reported detection limits for Se was rejected due to the 0.0% spike recovery. The spike recoveries for Tl, Mn, Sb, Ag, and As were outside the QC limit. The calibration blank had sodium at levels above the IDL. The reported results for sodium should be considered as the detection limit due to the possible laboratory contaminations. Also, the laboratory calibration and preparation blanks contained Al, Sb, Cu, and Cd at levels below the negative IDLs. The reported data ≥IDLs are qualified estimated due to the baseline drift. The duplicate analysis for lead exceeded 20% criteria. Overall, the data could be accepted with the applied qualifier codes.

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid or Kelly Spittler at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.

2. Attachment II - Data Summary.

ATTACHMENT II
DATA SUMMARY

WESTON
MANAGERS DESIGNERS/CONSULTANTS

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

R = UNRELIABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND WAS CONSIDERED AS NOT PRESENT IN THE SAMPLE.

(NO CODE) = CONFIRMED IDENTIFICATION

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

CASE NUMBER: 12475 SDG No.: SDG-614

CLIENT NAME: Stearns & Wheler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	Duplicate		MW1024		MW1027		MW1130		MW1258		SS-10X	
MATRIX:	Soil		Soil		Soil		Soil		Soil		Soil	
UNITS:	Mg/kg		Mg/kg		Mg/kg		Mg/kg		Mg/kg		Mg/kg	
Aluminum	22300		24800		19900		16900		8930		15000	
Antimony	26.9	J	25.1	J	28.2	J	24.2	J	20.9	J	24.6	J
Arsenic		R	4.9	J		R	3.0	J	3.1	J	2.2	J
Barium	101		48.2		71.6		48.5		25.8	J	33.4	J
Beryllium	1.0	J	1.0	J	0.74	J	0.81	J	0.51	J	0.55	J
Cadmium		UJ		UJ		UJ		UJ		UJ		UJ
Calcium	85000		36200		70600		92300		171000		69500	
Chromium	36.1		45.		34.2		32.5		16.7		30.1	
Cobalt	9.9	J	25.1		9.1	J	5.8	J	5.4	J	10.8	J
Copper	2.0	J	32.5	J	2.5	J	5.4	J	12.5	J	14.8	J
Iron	21300		28300		21200		16500		10,000		21100	
Lead	1.2	J	22.4	J	1.8	J	7.6	J	10.8	J	9.9	J
Magnesium	44900		31000		46900		54300		65.400		50900	
Manganese	259	J	263	J	264	J	276	J	231	J	292	J
Mercury			0.12								0.14	
Nickel	27.2		46.4		28.2		21.1		15.3		32.1	
Potassium	8390		8590		6350		6600		3590		3450	
Selenium		R		R		R		R		R		R
Silver												
Sodium	185	U	168	U	178	UJ	262	UJ	165	UJ	201	UJ
Thallium		UJ		UJ		UJ		UJ		UJ		UJ
Vanadium	32.9		39.6		27.2		26.6		20.0		22.1	
Zinc	29.1		46.7		30.3		22.4		45.0		29.8	
Cyanide		Q		Q		Q		Q		Q		Q

Q = not analyzed

Page 2 of 2

CASE NUMBER: 12475 SDC-# SDC-614 CLIENT NAME: Stearns & wheller

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	93-7XX		93-9XX									
MATRIX:	Soil		Soil									
UNITS:	mg/kg		mg/kg									
Aluminum	6130		6800									
Antimony	19.1	J	24.1	J								
Arsenic	3.3	J	2.6	J								
Barium	45.3		24.2	J								
Beryllium												
Cadmium		UJ		UJ								
Calcium	162000		150000									
Chromium	10.8		12.3									
Cobalt	4.0	J	4.	J								
Copper	14.5	J	17.2	J								
Iron	8920		11800									
Lead	4.5	J	7.4	J								
Magnesium	65300		71400									
Manganese	235	J	422	J								
Mercury	0.25											
Nickel			9.6									
Potassium	2320		2160									
Selenium		R		R								
Silver												
Sodium	171	U	182	U								
Thallium		UJ		UJ								
Vanadium	13.5		15.0									
Zinc	39.7		37.9									
Cyanide												

DATA COMPLIANCE

GROUP #	DATE	CLP YEAR	SAMPLE NO.	MATRIX	COMPLIANCY VOA	COMPLIANCY BNA	COMPLIANCY PEST/PCB	COMPLIANCY METALS	COMPLIANCY CN	TOTAL PHENOLS	PAGE NO. IN THE CLP	NON-COMPLIANCY
12802	8-14-92	3/90	MW-10	WATER	1	NA	NA	NA	NA	NA		
"	"	"	MW-3	WATER	1							(1) ALL ANALYSES WERE COMPLIANT
"	"	"	MW-5	WATER	1							
"			MW-9	WATER	1							
"	"		TRIP BLK	WATER	1							
"	"		WB-1	WATER	1							
"	"	"	BB-1A	SOIL	1							
"	"	"	BB-2A	SOIL	1							
	"	"	BB-2B	SOIL	1							
	"	"	BB-3A	SOIL	1							
	"	"	BB-3B	SOIL	1							
			BB-4A	SOIL	1							
			BB-4B	SOIL	1							
			DUP	SOIL	1							

2

WESTON
MANAGERS DESIGNERS/CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

ORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
CASE: 12515

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: Kelly Muir Spittler — 8-11-92
Kelly Muir Spittler — Date
Unit Leader - Data Validation

VERIFIED BY: Kelly Muir Spittler — 8-11-92
for Zohreh Hamid, Ph.D. — Date
Section Manager - Data Validation

STEARNS & WHELER
CASE: 12515
TCL VOLATILE ORGANICS

INTRODUCTION

This quality assurance review is based upon a review of all data generated from three soil samples and one duplicate analysis collected on 05-11,13-92. The samples were analyzed according to criteria set forth in the NYSDEC ASP 12/91 for TCL Volatile target compounds.

This review has been performed in accordance with the confirmation method. The reported analytical results are presented as a summary of the data in Attachment II. All of the analytical data were examined to determine the usability of the analytical results and also to determine contractual compliance relative to the analytical requirements and deliverables specified in NYSDEC ASP 12/91. The applicable qualifier codes have been placed next to the results in the data summary to indicate the qualitative and/or quantitative reliability. The details of this evaluation review are presented in the narrative section of this report.

All data have been validated with regard to usability according to the quality assurance set forth in NYSDEC ASP 12/91. If you have any questions or comments on this data review, please call Zohreh Hamid or Kelly Spittler at (215) 344-3745

QUALITY ASSURANCE REVIEW

The analyses were performed by NYTEST Environmental, Inc. for samples received on 05-14-92.

The findings offered in this report are based upon a rigorous review of the following criteria:

* • Holding Time
* • Blank
* • System Monitoring Compound Recoveries
* • Internal Standard
* • GC/MS Tuning
• Calibration
• Matrix Spike/Spike Duplicate and Matrix Spike Blank Analysis
• Duplicate Analysis
* • Instrument Performance
* • Compound Identification
• Compound Quantitation
* • Data Completeness

* All criteria were met; therefore, a narrative section is not provided for this classification.

CALIBRATION

Based on the criteria established on table 5 (page E-49) all compounds met the %D and RRF criteria in the continuing calibrations. The %RSD for bromoform (IC 05-01-92) exceeded 20.5%. Since there was only one outlier in this initial calibration and the %RSD was greater than 40%, the sample data were not qualified on the basis of this outlier. (page E-47, 2.4.4)

MATRIX SPIKE/SPIKE DUPLICATE AND MATRIX SPIKE BLANK

A matrix spike/spike duplicate and matrix spike blank analyses were not provided with this batch of samples. These QC analyses were performed in cases 12550 and 12699. The frequency requirements are specified on page E-56 7.1, this sample data has not been qualified in reference to these missing QC analyses.

DUPLICATE ANALYSIS

Sample ID "DUPLICATE" was analyzed with this batch; however, the corresponding sample analysis was not specified. The sample result reproducibility cannot be evaluated.

COMPOUND QUANTITATION

Samples DUPLICATE, MW10(25-5) and MW10(27-5) were all reanalyzed at 5-fold dilutions because the levels of trichloroethene exceeded the calibration range on the original analyses. The diluted analyses are to be used as the representative sample results, no qualification is applied to the sample data on this basis. (page E-60, 8)

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid or Kelly Spittler at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.
2. Attachment II - Data Summary.

WESTON.
MANAGERS DESIGNERS/CONSULTANTS

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS. [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2-butanone in the VOA analyses, and common phthalates in the BNA analyses) or less than 5 times the blank level for other target compounds or tentatively identified compounds.]

R = UNUSABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND. RESULT IS CONSIDERED AS NOT PRESENT IN THE SAMPLE.(i.e. A sample result was not confirmed in the Pesticide/PCB analysis)

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

ATTACHMENT II
DATA SUMMARY

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12515 Client: STEARNS & WHELER

Sample Information												
Cust ID:	DUPLICATE		MW10(25-5) DL		MW10(27-5) DL		MW11(30-32) DL					
Matrix:	SOIL		SOIL		SOIL		SOIL					
D.F.:	5		5		5		5					
Units:	ug/kg	fl	ug/kg	fl	ug/kg	fl	ug/kg	fl		fl		fl
Chloromethane												
Bromomethane												
Vinyl Chloride												
Chloroethane												
Methylene Chloride	10	J	6	J			2	J				
Acetone	65				250		24					
Carbon Disulfide												
1,1-Dichloroethene												
1,1-Dichloroethane												
Trans-1,2-Dichloroethene												
Chloroform												
1,2-Dichloroethane												
2-Butanone												
1,1,1-Trichloroethane												
Carbon Tetrachloride												
Bromodichloromethane												
1,2-Dichloropropane												
Trans-1,3-Dichloropropene												
Trichloroethene	200		840		390		30					
Dibromochloromethane												
1,1,2-Trichloroethane												
Benzene												
cis-1,3-Dichloropropene												
Bromoform												
4-Methyl-2-pentanone												
2-Hexanone												

Cust ID: DUPLICATE MW10(25-5) MW10(27-5) MW11(30-32)

Tetrachloroethene....................
1,1,2,2-Tetrachloroethane...........
Toluene.............................
Chlorobenzene.......................
Ethylbenzene........................
Styrene.............................
Total Xylenes.......................

WESTON®
MANAGERS DESIGNERS CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

ORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
CASE: 12550

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: Kelly Muir Spittler 8-11-92
Kelly Muir Spittler Date
Unit Leader - Data Validation

VERIFIED BY: Kelly Muir Spittler 8-11-92
for Zohreh Hamid, Ph.D. Date
Section Manager - Data Validation

DATA COMPLIANCE

					COMPLIANCY							
ROUP #	**DATE**	**CLP YEAR**	**SAMPLE NO.**	**MATRIX**	**VOA**	**BNA**	**PEST/PCB**	**METALS**	**CN**	**TOTAL PHENOLS**	**PAGE NO. IN THE CLP**	**NON-COMPLIANCY**
12550	8-11-92	3/90	SS-10	Soil	1	NA	NA	NR	NR	NA		
"	"	"	SS-7	Soil	1	↓	↓	↓	↓	↓		1) All Analyses Compliant
"	"	"	SS-9	Soil	1	↓	↓	↓	↓	↓		

NA = Not Analyzed

NR = Not Reported with Volatiles

WESTON
MANAGERS DESIGNERS/CONSULTANTS

STEARNS & WHELER
CASE: 12550
TCL VOLATILE ORGANICS

INTRODUCTION

This quality assurance review is based upon a review of all data generated from three soil samples collected on 05-14,15-92. The samples were analyzed according to criteria set forth in the NYSDEC ASP 12/91 for TCL Volatile target compounds.

This review has been performed in accordance with the confirmation method. The reported analytical results are presented as a summary of the data in Attachment II. All of the analytical data were examined to determine the usability of the analytical results and also to determine contractual compliance relative to the analytical requirements and deliverables specified in NYSDEC ASP 12/91. The applicable qualifier codes have been placed next to the results in the data summary to indicate the qualitative and/or quantitative reliability. The details of this evaluation review are presented in the narrative section of this report.

All data have been validated with regard to usability according to the quality assurance set forth in NYSDEC ASP 12/91. If you have any questions or comments on this data review, please call Zohreh Hamid or Kelly Spittler at (215) 344-3745

QUALITY ASSURANCE REVIEW

The analyses were performed by NYTEST Environmental, Inc. for samples received on 05-16-92.

The findings offered in this report are based upon a rigorous review of the following criteria:

* • Holding Time
• Blank
* • System Monitoring Compound Recoveries
* • Internal Standard
* • GC/MS Tuning
• Calibration
* • Matrix Spike/Spike Duplicate and Matrix Spike Blank Analysis
* • Instrument Performance
* • Compound Identification
* • Compound Quantitation
* • Data Completeness

* All criteria were met; therefore, a narrative section is not provided for this classification.

BLANK

The method blanks contained common contaminants methylene chloride and acetone at levels less or equal to 3X the CRQL. Methylene chloride was detected in the associated samples at levels less than the CRQL. These results are believed to be artifacts of laboratory contamination, they are elevated to the CRQL and are flagged "U". (page E-52, 5.1.2.1

CALIBRATION

Based on the criteria established on table 5 (page E-49) all compounds met the relative response factor criteria in both the initial and continuing calibrations. The %RSD for bromoform (IC 05-01-92) exceeded 20.5% and the %Ds for vinyl chloride (CC 05-21-92, 05-22-92) and bromomethane (CC 5-22-92) exceeded 25%. Since there were no more than two outliers per calibration, and the recoveries were less than 40%, the sample data were not qualified on the basis of these outliers. (page E-47, 2.4.4)

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid or Kelly Spittler at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.
2. Attachment II - Data Summary.

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS. [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2-butanone in the VOA analyses, and common phthalates in the BNA analyses) or less than 5 times the blank level for other target compounds or tentatively identified compounds.]

R = UNUSABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND. RESULT IS CONSIDERED AS NOT PRESENT IN THE SAMPLE.(i.e. A sample result was not confirmed in the Pesticide/PCB analysis)

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12550 **Client:** STEARNS & WHELER **PAGE:** 1

Sample Information

Cust ID:	SS-10	SS-7	SS-9
Matrix:	SOIL	SOIL	SOIL
D.F.:	1	1	1
Units:	ug/kg	ug/kg	ug/kg
Chloromethane			
Bromomethane			
Vinyl Chloride			
Chloroethane			
Methylene Chloride	11 U	11 U	11 U
Acetone			
Carbon Disulfide			
1,1-Dichloroethene			
1,1-Dichloroethane			
Trans-1,2-Dichloroethene			
Chloroform			
1,2-Dichloroethane			
2-Butanone			
1,1,1-Trichloroethane			
Carbon Tetrachloride			
Bromodichloromethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene		38	5 J
Dibromochloromethane			
1,1,2-Trichloroethane			
Benzene			
cis-1,3-Dichloropropene			
Bromoform			
4-Methyl-2-pentanone			
2-Hexanone			

WESTON
MANAGERS DESIGNERS/CONSULTANTS

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS. [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2-butanone in the VOA analyses, and common phthalates in the BNA analyses) or less than 5 times the blank level for other target compounds or tentatively identified compounds.]

R = UNUSABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND. RESULT IS CONSIDERED AS NOT PRESENT IN THE SAMPLE.(i.e. A sample result was not confirmed in the Pesticide/PCB analysis)

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12550 Client: STEARNS & WHELER PAGE: 1

Sample Information	Cust ID:	SS-10	SS-7	SS-9
	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1	1	1
	Units:	ug/kg	ug/kg	ug/kg
Chloromethane				
Bromomethane				
Vinyl Chloride				
Chloroethane				
Methylene Chloride		11 U	11 U	11 U
Acetone				
Carbon Disulfide				
1,1-Dichloroethene				
1,1-Dichloroethane				
Trans-1,2-Dichloroethene				
Chloroform				
1,2-Dichloroethane				
2-Butanone				
1,1,1-Trichloroethane				
Carbon Tetrachloride				
Bromodichloromethane				
1,2-Dichloropropane				
Trans-1,3-Dichloropropene				
Trichloroethene			38	5 J
Dibromochloromethane				
1,1,2-Trichloroethane				
Benzene				
cis-1,3-Dichloropropene				
Bromoform				
4-Methyl-2-pentanone				
2-Hexanone				

```
=====================================================================================================
Case Number:  12550                    Client:  STEARNS & WHELER                          PAGE: 1
-----------------------------------------------------------------------------------------------------
                                  Cust ID:    SS-10        SS-7        SS-9

============================================fl=========fl=========fl=========fl=========fl=========fl
Tetrachloroethene....................
1,1,2,2-Tetrachloroethane............
Toluene..............................
Chlorobenzene........................
Ethylbenzene.........................
Styrene..............................
Total Xylenes........................
```

WESTON
MANAGERS DESIGNERS CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

ORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
CASE: 12755

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: Kelly Muir Spittler 8-11-92
Kelly Muir Spittler Date
Unit Leader - Data Validation

VERIFIED BY: Kelly Muir Spittler 8-11-92
for Zohreh Hamid, Ph.D. Date
Section Manager - Data Validation

WESTON.
MANAGERS DESIGNERS/CONSULTANTS

STEARNS & WHELER
CASE: 12755
TCL VOLATILE ORGANICS

INTRODUCTION

This quality assurance review is based upon a review of all data generated from seven soil samples, one duplicate analysis and one trip blank collected on 06-02-92. The samples were analyzed according to criteria set forth in the NYSDEC ASP 12/91 for TCL Volatile target compounds.

This review has been performed in accordance with the confirmation method. The reported analytical results are presented as a summary of the data in Attachment II. All of the analytical data were examined to determine the usability of the analytical results and also to determine contractual compliance relative to the analytical requirements and deliverables specified in NYSDEC ASP 12/91. The applicable qualifier codes have been placed next to the results in the data summary to indicate the qualitative and/or quantitative reliability. The details of this evaluation review are presented in the narrative section of this report.

All data have been validated with regard to usability according to the quality assurance set forth in NYSDEC ASP 12/91. If you have any questions or comments on this data review, please call Zohreh Hamid or Kelly Spittler at (215) 344-3745

QUALITY ASSURANCE REVIEW

The analyses were performed by NYTEST Environmental, Inc. for samples received on 06-04-92.

The findings offered in this report are based upon a rigorous review of the following criteria:

- * Holding Time
- Blank
- * System Monitoring Compound Recoveries
- * Internal Standard
- * GC/MS Tuning
- Calibration
- * Matrix Spike/Spike Duplicate and Matrix Spike Blank Analyses
- Duplicate Analysis
- * Instrument Performance
- * Compound Identification
- Compound Quantitation
- * Data Completeness

* All criteria were met; therefore, a narrative section is not provided for this classification.

INORGANIC SOIL ANALYSIS

SITE: STEARNS & WHELER
CASE: 12699

Sample Number:		BB-5AX	BB-5BX	BB-6AX	BB-6BX	BB-6CX	ST-1
Units:		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
INORGANIC ELEMENTS	METHOD						
Aluminium	P	7510	7260	7010	4160	6480	15100
Antimony	P	17.4 J	19.6 J	9.0 UJ	7.5 UJ	12.2 J	19.0 J
Arsenic	F	3.6	2.3	2.1	1.4	2.8	6.7
Barium	P	67.8	40.5	35.1	38.0	42.8	83.5
Beryllium	P	0.40	0.55	0.33	0.27	0.40	0.87
Cadmium	P	1.1 U	0.95 U	0.96 U	0.80 U	1.0 U	0.90 U
Calcium	P	118000	141000	122000	82500	117000	55800
Chromium	P	13.1	14.7	12.8	7.4	12.1	27.0
Cobalt	P	5.2	5.5	5.2	3.5	3.9	12.3
Copper	P	5.0 J	6.5 J	4.2 J	6.1 J	4.5 J	65.7 J
Iron	P	11800	14200	11500	6660	9410	24600
Lead	F	28.9	12.7	8.2	9.2	9.1	23.3
Magnesium	P	24200	32800	29500	13000	25400	28000
Manganese	P	333	273	223	122	159	891
Mercury	CV	0.14 U	0.13 U	0.13 U	0.11 U	0.14 U	0.12 U
Nickel	P	10.8	15.7	11.4	8.6	12.2	28.2
Potassium	P	1350	1490	1560	938 U	1710	2200
Selenium	F	1.4 UJ	1.3 U	1.3 UJ	1.1 U	1.4 U	1.2 U
Silver	P	2.7 UJ	2.5 UJ	2.5 UJ	2.1 UJ	2.7 UJ	2.3 UJ
Sodium	P	133 U	136	122 U	102 U	131 U	126
Thallium	F	1.4 U	1.3 U	1.3 U	1.1 U	1.4 U	1.2 U
Vanadium	P	14.7	14.0	14.2	9.4	12.6	31.9
Zinc	P	67.1	53.1	51.7	50.0	56.5	644

NOTE:
J - QUANTITATION IS APPROXIMATE DUE TO THE LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
-- VALUE IS NON-DETECTED
U - VALUE IS NON-DETECTED AND DETECTION LIMIT IS RAISED.
UJ- VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.

F - FURNACE
P - ICP/FLAME AA
CV - COLD VAPOR

VOLUMES USED IN PREPARING SAMPLE FOR ANALYSIS: HG , AA & ICP.

INORGANIC WATER ANALYSIS

Sample Number:		SW-1XX	SW-2XX	SW-3XX	SW-4XX	SW-5XX	SW-6XX	SW-7XX	DUPXXX
Units:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
INORGANIC ELEMENTS	METHOD								
Aluminium	P	36.3 U	36.3 U	36.3 U	36.3 U	36.3 U	36.3 U	36.5	36.3 U
Antimony	P	35.7 U	35.7 U	35.7 U	37.7	35.7 U	35.7 U	35.7 U	39.4
Arsenic	F	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Barium	P	82.3	87.9	84.8	87.8	88.8	82.9	159	84.8
Beryllium	P	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Cadmium	P	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Calcium	P	142000	141000	144000	151000	157000	156000	85800	139000
Chromium	P	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ
Cobalt	P	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U
Copper	P	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ	3.9 UJ
Iron	P	11.2 U	11.2 U	11.2 U	11.2 U	11.2 U	11.2 U	11.2 U	11.2 U
Lead	F	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Magnesium	P	23200	23900	24400	25200	26000	25400	28700	23300
Manganese	P	1.3 UJ	3.4 UJ	2.0 UJ	1.4 UJ	1.4 UJ	1.3 UJ	1.5 UJ	1.3 UJ
Mercury	CV	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	P	30.6 U	30.6 U	30.6 U	30.6 U	30.6 U	30.6 U	30.6 U	30.6 U
Potassium	P	1960 UJ	1780 UJ	2170 UJ	2540 UJ	2440 UJ	1380 UJ	1190 U	2130 UJ
Selenium	F	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	P	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ	9.9 UJ
Sodium	P	25100	27300	27100	27100	27800	27100	5500	26300
Thallium	F	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Vanadium	P	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
Zinc	P	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U	4.5 U

NOTE:
J - QUANTITATION IS APPROXIMATE DUE TO THE LIMITATIONS IDENTIFIED IN THE QUALITY CONTROL REVIEW (DATA REVIEW).
-- VALUE IS NON-DETECTED
U - VALUE IS NON-DETECTED AND DETECTION LIMIT IS RAISED.
UJ- VALUE IS NON-DETECTED AND DETECTION LIMIT IS ESTIMATED.

F - FURNACE
P - ICP/FLAME AA
CV - COLD VAPOR

VOLUMES USED IN PREPARING SAMPLE FOR ANALYSIS: HG , AA & ICP.

ATTACHMENT II
DATA SUMMARY

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

R = UNRELIABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND WAS CONSIDERED AS NOT PRESENT IN THE SAMPLE.

(NO CODE) = CONFIRMED IDENTIFICATION

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 9/89. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.
2. Attachment II - Data Summary.

ICP Interference Check Samples

Several elements were reported that are not present in the ICSA solution. Ca was found to be >50% of the ICS concentration in several samples; however, no IEC values are reported so no qualification was required.

Matrix Spike Sample

The matrix spike sample percent recoveries for Ag (69.7) in the water sample and Sb (43.1) in the soil sample analysis were below the CLP control limits. All associated sample results are qualified as estimated and considered to be biased low.

Laboratory Duplicates

The soil laboratory duplicate contained Cu (23.2%) above the CLP control limit (20%). All associated sample results are qualified.

Laboratory Control Samples

The soil LCS result was below the CLP control limits for Ag. All associated sample results are qualified as estimated and considered to be biased low.

Furnace Atomic Absorption Results

The post-digestion spike sample percent recoveries for Se and Tl were below the CLP control limits. All associated sample results are qualified as estimated and considered to be biased low.

SAMPLE	ELEMENT	% RECOVERY
BB-5A	Se	82
BB-6A	Se	84
SW-1	Tl	75
SW-2	Tl	82
SW-3	Tl	81

OVERALL SAMPLE RESULTS

The quality of the data are fair and considered to be representative with the applied qualifier codes.

STEARNS & WHELER
SITE: ADC
CASE: 12699

CASE SUMMARY

This data validation review consists of six soil and eight water samples collected on 05-28-92. Laboratory analyses were performed by NYTEST Environmental, Inc. (NEI) for Target Analyte List (TAL) inorganics.

All data have been validated with regard to usability according to the quality assurance guidelines set forth by NYSDEC ASP 9/89. If you have any questions or comments on this data review, please contact Zohreh Hamid at (215) 344-3745.

The data were evaluated based upon the following parameters:

* • Data Completeness
* • Holding Times
* • Calibration
• Laboratory and Field Blanks
• ICP Interference Check Samples
• Matrix Spike Samples
• Laboratory and Field Duplicates
* • Laboratory Control Samples
• Furnace Atomic Absorption Results
* • Serial Dilution Samples
* • Detection Limits
* • Overall Sample Results

Laboratory and Field Blanks

The calibration blanks contained Cd, Fe, Mn, and K above the IDL. All sample results <5X the blank concentration are considered to be estimated due to possible laboratory contamination. All results ≤5X the blank concentration or <IDL are accepted unqualified.

The calibration blanks contained Cr, and Cu below the negative IDL. All associated sample results <5X the absolute blank value are qualified as estimated and considered to be biased low due to baseline drift.

The water preparation blank contained Cu, and Mn below the negative IDL. all associated sample results <5X the absolute blank value are qualified as estimated and considered to be biased low due to baseline drift.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

INORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
SITE: ADC
CASE: 12699

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: Kelly Muir Saittler 8-11-92
for **Zohreh Hamid, Ph.D** **Date**
Section Manager - Data Validation

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12699 Client: STEARNS & WHELER PAGE: 3

Sample Information	Cust ID:	SW-6	SW-7	TB
	Matrix:	WATER	WATER	WATER
	D.F.:	1	1	1
	Units:	ug/L	ug/L	ug/L
Chloromethane........................				
Bromomethane.........................				
Vinyl Chloride.......................				
Chloroethane.........................				
Methylene Chloride...................		10 U	10 U	10 U
Acetone..............................		21 U		15 U
Carbon Disulfide.....................				
1,1-Dichloroethene...................				
1,1-Dichloroethane...................				
1,2-Dichloroethene...................				
Chloroform...........................				
1,2-Dichloroethane...................				
2-Butanone...........................				
1,1,1-Trichloroethane................				
Carbon Tetrachloride.................				
Bromodichloromethane.................				
1,2-Dichloropropane..................				
Trans-1,3-Dichloropropene............				
Trichloroethene......................		3 J	67	
Dibromochloromethane.................				
1,1,2-Trichloroethane................				
Benzene..............................				
cis-1,3-Dichloropropene..............				
Bromoform............................				
4-Methyl-2-pentanone.................				
2-Hexanone...........................				

```
==================================================================================================
Case Number:  12699                    Client:  STEARNS & WHELER                          PAGE: 3
--------------------------------------------------------------------------------------------------
                                Cust ID:      SW-6        SW-7         TB

==============================================fl=========fl=========fl=========fl=========fl=========fl
Tetrachloroethene...................
1,1,2,2-Tetrachloroethane...........
Toluene.............................
Chlorobenzene.......................
Ethylbenzene........................
Styrene.............................
Total Xylenes.......................
```

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/14/93

SAMPLE ID: S-6

LAB ID: 1765109

DIL FACTOR: 20.00

% MOISTURE: 31

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	10000.0 U.
2	208-96-8	Acenaphthylene	10000.0 U.
3	83-32-9	Acenaphthene	10000.0 U.
4	86-73-7	Fluorene	10000.0 U.
5	85-01-8	Phenanthrene	3800.0 J.
6	120-12-7	Anthracene	1100.0 J.
7	206-44-0	Fluoranthene	3200.0 J.
8	129-00-0	Pyrene	3500.0 J.
9	56-55-3	Benzo(a)Anthracene	10000.0 U.
10	218-01-9	Chrysene	10000.0 U.
11	205-99-2	Benzo(b)Fluoranthene	10000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	10000.0 U.
13	50-32-8	Benzo(a)Pyrene	10000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	10000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	10000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	10000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-6RE
CONC. LEVEL:	LOW	LAB ID:	1765109
EXTRACTION DATE:	8/2/93	DIL FACTOR:	20.00
ANALYSIS DATE:	8/18/93	% MOISTURE:	31

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	10000.0 U.
2	208-96-8	Acenaphthylene	10000.0 U.
3	83-32-9	Acenaphthene	10000.0 U.
4	86-73-7	Fluorene	10000.0 U.
5	85-01-8	Phenanthrene	3600.0 J.
6	120-12-7	Anthracene	1200.0 J.
7	206-44-0	Fluoranthene	3000.0 J.
8	129-00-0	Pyrene	2900.0 J.
9	56-55-3	Benzo(a)Anthracene	2100.0 J.
10	218-01-9	Chrysene	5100.0 J.
11	205-99-2	Benzo(b)Fluoranthene	10000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	10000.0 U.
13	50-32-8	Benzo(a)Pyrene	10000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	10000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	10000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	10000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: S-8
LAB ID: 1765103
DIL FACTOR: 2.00
% MOISTURE: 17

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	1000.0 U.
2	208-96-8	Acenaphthylene	1000.0 U.
3	83-32-9	Acenaphthene	1000.0 U.
4	86-73-7	Fluorene	1000.0 U.
5	85-01-8	Phenanthrene	270.0 J.
6	120-12-7	Anthracene	1000.0 U.
7	206-44-0	Fluoranthene	260.0 J.
8	129-00-0	Pyrene	680.0 J.
9	56-55-3	Benzo(a)Anthracene	1000.0 U.
10	218-01-9	Chrysene	1000.0 U.
11	205-99-2	Benzo(b)Fluoranthene	1000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	1000.0 U.
13	50-32-8	Benzo(a)Pyrene	1000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	1000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	1000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	1000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: S-8RE
LAB ID: 1765103
DIL FACTOR: 2.00
% MOISTURE: 17

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	1000.0 U.
2	208-96-8	Acenaphthylene	1000.0 U.
3	83-32-9	Acenaphthene	1000.0 U.
4	86-73-7	Fluorene	1000.0 U.
5	85-01-8	Phenanthrene	260.0 J.
6	120-12-7	Anthracene	1000.0 U.
7	206-44-0	Fluoranthene	260.0 J.
8	129-00-0	Pyrene	600.0 J.
9	56-55-3	Benzo(a)Anthracene	100.0 J.
10	218-01-9	Chrysene	160.0 J.
11	205-99-2	Benzo(b)Fluoranthene	1000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	1000.0 U.
13	50-32-8	Benzo(a)Pyrene	1000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	1000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	1000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	1000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: S-9
LAB ID: 1765106
DIL FACTOR: 4.00
% MOISTURE: 42

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	2000.0 U.
2	208-96-8	Acenaphthylene	2000.0 U.
3	83-32-9	Acenaphthene	2000.0 U.
4	86-73-7	Fluorene	2000.0 U.
5	85-01-8	Phenanthrene	780.0 J.
6	120-12-7	Anthracene	280.0 J.
7	206-44-0	Fluoranthene	660.0 J.
8	129-00-0	Pyrene	780.0 J.
9	56-55-3	Benzo(a)Anthracene	2000.0 U.
10	218-01-9	Chrysene	800.0 J.
11	205-99-2	Benzo(b)Fluoranthene	2000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	2000.0 U.
13	50-32-8	Benzo(a)Pyrene	2000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	2000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	2000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	2000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/18/93

SAMPLE ID: S-9RE

LAB ID: 1765106

DIL FACTOR: 4.00

% MOISTURE: 42

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	2000.0 U.
2	208-96-8	Acenaphthylene	2000.0 U.
3	83-32-9	Acenaphthene	2000.0 U.
4	86-73-7	Fluorene	2000.0 U.
5	85-01-8	Phenanthrene	820.0 J.
6	120-12-7	Anthracene	790.0 J.
7	206-44-0	Fluoranthene	680.0 J.
8	129-00-0	Pyrene	760.0 J.
9	56-55-3	Benzo(a)Anthracene	740.0 J.
10	218-01-9	Chrysene	1200.0 J.
11	205-99-2	Benzo(b)Fluoranthene	2000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	270.0 J.
13	50-32-8	Benzo(a)Pyrene	2000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	2000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	2000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	2000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: WASH BLK
LAB ID: 1765121
DIL FACTOR: 1.00
% MOISTURE: NA

CMPD #	CAS Number	PAH COMPOUNDS	UG/L
1	91-20-3	Naphthalene	10.0 U.
2	208-96-8	Acenaphthylene	10.0 U.
3	83-32-9	Acenaphthene	10.0 U.
4	86-73-7	Fluorene	10.0 U.
5	85-01-8	Phenanthrene	10.0 U.
6	120-12-7	Anthracene	10.0 U.
7	206-44-0	Fluoranthene	10.0 U.
8	129-00-0	Pyrene	10.0 U.
9	56-55-3	Benzo(a)Anthracene	10.0 U.
10	218-01-9	Chrysene	10.0 U.
11	205-99-2	Benzo(b)Fluoranthene	10.0 U.
12	207-08-9	Benzo(k)Fluoranthene	10.0 U.
13	50-32-8	Benzo(a)Pyrene	10.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	10.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	10.0 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: S-2
LAB SAMPLE ID: 1765101
DIL FACTOR: 1.00
% MOISTURE: 22

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	100.000 U.
22	11104-28-2	Aroclor-1221	100.000 U.
23	11141-16-5	Aroclor-1232	100.000 U.
24	53469-21-9	Aroclor-1242	100.000 U.
25	12672-29-6	Aroclor-1248	100.000 U.
26	11097-69-1	Aroclor-1254	210.000 U.
27	11096-82-5	Aroclor-1260	210.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: S-3
LAB SAMPLE ID: 1765102
DIL FACTOR: 1.00
% MOISTURE: 19

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	100.000 U.
22	11104-28-2	Aroclor-1221	100.000 U.
23	11141-16-5	Aroclor-1232	100.000 U.
24	53469-21-9	Aroclor-1242	100.000 U.
25	12672-29-6	Aroclor-1248	100.000 U.
26	11097-69-1	Aroclor-1254	200.000 U.
27	11096-82-5	Aroclor-1260	200.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: S-8
LAB SAMPLE ID: 1765103
DIL FACTOR: 1.00
% MOISTURE: 17

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	100.000 U.
22	11104-28-2	Aroclor-1221	100.000 U.
23	11141-16-5	Aroclor-1232	100.000 U.
24	53469-21-9	Aroclor-1242	100.000 U.
25	12672-29-6	Aroclor-1248	100.000 U.
26	11097-69-1	Aroclor-1254	190.000 U.
27	11096-82-5	Aroclor-1260	190.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/15/93

SAMPLE ID: S-1
LAB SAMPLE ID: 1765104
DIL FACTOR: 1.00
% MOISTURE: 17

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	100.000 U.
22	11104-28-2	Aroclor-1221	100.000 U.
23	11141-16-5	Aroclor-1232	100.000 U.
24	53469-21-9	Aroclor-1242	100.000 U.
25	12672-29-6	Aroclor-1248	100.000 U.
26	11097-69-1	Aroclor-1254	190.000 U.
27	11096-82-5	Aroclor-1260	190.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-14
LAB SAMPLE ID: 1765105
DIL FACTOR: 5.00
% MOISTURE: 29

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	560.000 U.
22	11104-28-2	Aroclor-1221	560.000 U.
23	11141-16-5	Aroclor-1232	560.000 U.
24	53469-21-9	Aroclor-1242	560.000 U.
25	12672-29-6	Aroclor-1248	1500.000
26	11097-69-1	Aroclor-1254	1100.000 U.
27	11096-82-5	Aroclor-1260	1100.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-9
LAB SAMPLE ID: 1765106
DIL FACTOR: 5.00
% MOISTURE: 42

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	690.000 U.
22	11104-28-2	Aroclor-1221	690.000 U.
23	11141-16-5	Aroclor-1232	690.000 U.
24	53469-21-9	Aroclor-1242	690.000 U.
25	12672-29-6	Aroclor-1248	690.000 U.
26	11097-69-1	Aroclor-1254	1400.000 U.
27	11096-82-5	Aroclor-1260	370.000 J.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-5
LAB SAMPLE ID: 1765107
DIL FACTOR: 5.00
% MOISTURE: 34

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	610.000 U.
22	11104-28-2	Aroclor-1221	610.000 U.
23	11141-16-5	Aroclor-1232	610.000 U.
24	53469-21-9	Aroclor-1242	610.000 U.
25	12672-29-6	Aroclor-1248	1900.000
26	11097-69-1	Aroclor-1254	1200.000 U.
27	11096-82-5	Aroclor-1260	1200.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-15
LAB SAMPLE ID: 1765108
DIL FACTOR: 5.00
% MOISTURE: 68

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	1300.000 U.
22	11104-28-2	Aroclor-1221	1300.000 U.
23	11141-16-5	Aroclor-1232	1300.000 U.
24	53469-21-9	Aroclor-1242	1300.000 U.
25	12672-29-6	Aroclor-1248	1300.000 U.
26	11097-69-1	Aroclor-1254	2500.000 U.
27	11096-82-5	Aroclor-1260	1500.000 J.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-6
LAB SAMPLE ID: 1765109
DIL FACTOR: 5.00
% MOISTURE: 31

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	580.000 U.
22	11104-28-2	Aroclor-1221	580.000 U.
23	11141-16-5	Aroclor-1232	580.000 U.
24	53469-21-9	Aroclor-1242	580.000 U.
25	12672-29-6	Aroclor-1248	580.000 U.
26	11097-69-1	Aroclor-1254	700.000 J.
27	11096-82-5	Aroclor-1260	1200.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-10
LAB SAMPLE ID: 1765110
DIL FACTOR: 5.00
% MOISTURE: 22

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	510.000 U.
22	11104-28-2	Aroclor-1221	510.000 U.
23	11141-16-5	Aroclor-1232	510.000 U.
24	53469-21-9	Aroclor-1242	510.000 U.
25	12672-29-6	Aroclor-1248	2600.000
26	11097-69-1	Aroclor-1254	1000.000 U.
27	11096-82-5	Aroclor-1260	1000.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-13
LAB SAMPLE ID: 1765111
DIL FACTOR: 5.00
% MOISTURE: 20

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	430.000 J.
22	11104-28-2	Aroclor-1221	500.000 U.
23	11141-16-5	Aroclor-1232	500.000 U.
24	53469-21-9	Aroclor-1242	1000.000
25	12672-29-6	Aroclor-1248	500.000 U.
26	11097-69-1	Aroclor-1254	1000.000 U.
27	11096-82-5	Aroclor-1260	1000.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-12
LAB SAMPLE ID: 1765114
DIL FACTOR: 5.00
% MOISTURE: 17

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	480.000 U.
22	11104-28-2	Aroclor-1221	480.000 U.
23	11141-16-5	Aroclor-1232	480.000 U.
24	53469-21-9	Aroclor-1242	480.000 U.
25	12672-29-6	Aroclor-1248	1700.000
26	11097-69-1	Aroclor-1254	960.000 U.
27	11096-82-5	Aroclor-1260	960.000 U.

1 D-T

. NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-18
CONC. LEVEL:	LOW	LAB SAMPLE ID:	1765115
EXTRACTION DATE:	8/02/93	DIL FACTOR:	5.00
ANALYSIS DATE:	8/25/93	% MOISTURE:	23

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	520.000 U.
22	11104-28-2	Aroclor-1221	520.000 U.
23	11141-16-5	Aroclor-1232	520.000 U.
24	53469-21-9	Aroclor-1242	520.000 U.
25	12672-29-6	Aroclor-1248	520.000 U.
26	11097-69-1	Aroclor-1254	1000.000 U.
27	11096-82-5	Aroclor-1260	1000.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: S-16
LAB SAMPLE ID: 1765116
DIL FACTOR: 5.00
% MOISTURE: 20

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	500.000 U.
22	11104-28-2	Aroclor-1221	500.000 U.
23	11141-16-5	Aroclor-1232	500.000 U.
24	53469-21-9	Aroclor-1242	500.000 U.
25	12672-29-6	Aroclor-1248	500.000 U.
26	11097-69-1	Aroclor-1254	1000.000 U.
27	11096-82-5	Aroclor-1260	1000.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/02/93

ANALYSIS DATE: 8/17/93

SAMPLE ID: S-17

LAB SAMPLE ID: 1765117

DIL FACTOR: 1.00

% MOISTURE: 25

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	110.000 U.
22	11104-28-2	Aroclor-1221	110.000 U.
23	11141-16-5	Aroclor-1232	110.000 U.
24	53469-21-9	Aroclor-1242	110.000 U.
25	12672-29-6	Aroclor-1248	110.000 U.
26	11097-69-1	Aroclor-1254	210.000 U.
27	11096-82-5	Aroclor-1260	210.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: DUP
LAB SAMPLE ID: 1765118
DIL FACTOR: 5.00
% MOISTURE: 30

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	570.000 U.
22	11104-28-2	Aroclor-1221	570.000 U.
23	11141-16-5	Aroclor-1232	570.000 U.
24	53469-21-9	Aroclor-1242	570.000 U.
25	12672-29-6	Aroclor-1248	570.000 U.
26	11097-69-1	Aroclor-1254	1100.000 U.
27	11096-82-5	Aroclor-1260	1100.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/25/93

SAMPLE ID: S-11
LAB SAMPLE ID: 1765119
DIL FACTOR: 5.00
% MOISTURE: 28

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	560.000 U.
22	11104-28-2	Aroclor-1221	560.000 U.
23	11141-16-5	Aroclor-1232	560.000 U.
24	53469-21-9	Aroclor-1242	560.000 U.
25	12672-29-6	Aroclor-1248	560.000 U.
26	11097-69-1	Aroclor-1254	1100.000 U.
27	11096-82-5	Aroclor-1260	240.000

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: S-4
LAB SAMPLE ID: 1765120
DIL FACTOR: 5.00
% MOISTURE: 44

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	710.000 U.
22	11104-28-2	Aroclor-1221	710.000 U.
23	11141-16-5	Aroclor-1232	710.000 U.
24	53469-21-9	Aroclor-1242	710.000 U.
25	12672-29-6	Aroclor-1248	710.000 U.
26	11097-69-1	Aroclor-1254	1400.000 U.
27	11096-82-5	Aroclor-1260	320.000 J.

1 D-T
NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: WATER
CONC. LEVEL: LOW
EXTRACTION DATE: 8/02/93
ANALYSIS DATE: 8/14/93

SAMPLE ID: WASH BLK
LAB SAMPLE ID: 1765121
DIL FACTOR: 1.43
% MOISTURE:NA

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/L
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	0.700 U.
22	11104-28-2	Aroclor-1221	0.700 U.
23	11141-16-5	Aroclor-1232	0.700 U.
24	53469-21-9	Aroclor-1242	0.700 U.
25	12672-29-6	Aroclor-1248	0.700 U.
26	11097-69-1	Aroclor-1254	1.000 U.
27	11096-82-5	Aroclor-1260	1.000 U.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DUP

Lab Name: NYTEST ENV INC   Contract: 9320279

Lab Code: NYTEST   Case No.: 17823   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: 1782306

Sample wt/vol: 5.0 (g/mL) ML   Lab File ID: E1314

Level: (low/med) LOW   Date Received: 08/12/93

% Moisture: not dec. ____   Date Analyzed: 08/17/93

GC Column: PACK   ID: 2.00 (mm)   Dilution Factor: 1.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	3	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

DUP

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782306

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1314

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-10

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782302

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1310

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	1400	E
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MW-10

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782302

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1310

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ______ (uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000014

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-10DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782302

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1332

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 50.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	500	U
74-83-9	Bromomethane	500	U
75-01-4	Vinyl Chloride	500	U
75-00-3	Chloroethane	500	U
75-09-2	Methylene Chloride	500	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	500	U
75-35-4	1,1-Dichloroethene	500	U
75-34-3	1,1-Dichloroethane	500	U
540-59-0	1,2-Dichloroethene (total)	500	U
67-66-3	Chloroform	500	U
107-06-2	1,2-Dichloroethane	500	U
78-93-3	2-Butanone	500	U
71-55-6	1,1,1-Trichloroethane	500	U
56-23-5	Carbon Tetrachloride	500	U
75-27-4	Bromodichloromethane	500	U
78-87-5	1,2-Dichloropropane	500	U
10061-01-5	cis-1,3-Dichloropropene	500	U
79-01-6	Trichloroethene	1300	D
124-48-1	Dibromochloromethane	500	U
79-00-5	1,1,2-Trichloroethane	500	U
71-43-2	Benzene	500	U
10061-02-6	trans-1,3-Dichloropropene	500	U
75-25-2	Bromoform	500	U
108-10-1	4-Methyl-2-Pentanone	500	U
591-78-6	2-Hexanone	500	U
127-18-4	Tetrachloroethene	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U
108-88-3	Toluene	500	U
108-90-7	Chlorobenzene	500	U
100-41-4	Ethylbenzene	500	U
100-42-5	Styrene	500	U
1330-20-7	Xylene (total)	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-10DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782302

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1332

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 50.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	7.00	320	J

0000016

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-11

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782317

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1328

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	14	
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	3400	E
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-11

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER

Lab Sample ID: 1782317

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: E1328

Level: (low/med) LOW

Date Received: 08/12/93

% Moisture: not dec. ____

Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ______ (uL)

Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000018

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-11DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782317

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1340

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 100.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1000	U
74-83-9	Bromomethane	1000	U
75-01-4	Vinyl Chloride	1000	U
75-00-3	Chloroethane	1000	U
75-09-2	Methylene Chloride	1000	U
67-64-1	Acetone	1000	U
75-15-0	Carbon Disulfide	1000	U
75-35-4	1,1-Dichloroethene	1000	U
75-34-3	1,1-Dichloroethane	1000	U
540-59-0	1,2-Dichloroethene (total)	1000	U
67-66-3	Chloroform	1000	U
107-06-2	1,2-Dichloroethane	1000	U
78-93-3	2-Butanone	1000	U
71-55-6	1,1,1-Trichloroethane	1000	U
56-23-5	Carbon Tetrachloride	1000	U
75-27-4	Bromodichloromethane	1000	U
78-87-5	1,2-Dichloropropane	1000	U
10061-01-5	cis-1,3-Dichloropropene	1000	U
79-01-6	Trichloroethene	11000	D
124-48-1	Dibromochloromethane	1000	U
79-00-5	1,1,2-Trichloroethane	1000	U
71-43-2	Benzene	1000	U
10061-02-6	trans-1,3-Dichloropropene	1000	U
75-25-2	Bromoform	1000	U
108-10-1	4-Methyl-2-Pentanone	1000	U
591-78-6	2-Hexanone	1000	U
127-18-4	Tetrachloroethene	1000	U
79-34-5	1,1,2,2-Tetrachloroethane	1000	U
108-88-3	Toluene	1000	U
108-90-7	Chlorobenzene	1000	U
100-41-4	Ethylbenzene	1000	U
100-42-5	Styrene	1000	U
1330-20-7	Xylene (total)	1000	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-11DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782317

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1340

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 100.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-12

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782312

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1319

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	32	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-12

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782312

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1319

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN SILOXANE	34.67	15	J

0000022

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-13

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782316

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1327

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	840	E
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-13

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782316

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1327

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000024

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-13DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: 1782316

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1339

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 25.0

Soil Extract Volume: ____ (uL) Soil Aliquot Volume: ____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	250	U
74-83-9	Bromomethane	250	U
75-01-4	Vinyl Chloride	250	U
75-00-3	Chloroethane	250	U
75-09-2	Methylene Chloride	250	U
67-64-1	Acetone	250	U
75-15-0	Carbon Disulfide	250	U
75-35-4	1,1-Dichloroethene	250	U
75-34-3	1,1-Dichloroethane	250	U
540-59-0	1,2-Dichloroethene (total)	250	U
67-66-3	Chloroform	250	U
107-06-2	1,2-Dichloroethane	250	U
78-93-3	2-Butanone	250	U
71-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	250	U
75-27-4	Bromodichloromethane	250	U
78-87-5	1,2-Dichloropropane	250	U
10061-01-5	cis-1,3-Dichloropropene	250	U
79-01-6	Trichloroethene	610	D
124-48-1	Dibromochloromethane	250	U
79-00-5	1,1,2-Trichloroethane	250	U
71-43-2	Benzene	250	U
10061-02-6	trans-1,3-Dichloropropene	250	U
75-25-2	Bromoform	250	U
108-10-1	4-Methyl-2-Pentanone	250	U
591-78-6	2-Hexanone	250	U
127-18-4	Tetrachloroethene	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
108-88-3	Toluene	250	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	250	U
100-42-5	Styrene	250	U
1330-20-7	Xylene (total)	250	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-13DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782316

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1339

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 25.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000026

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-14

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782319

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1330

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	130	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-14

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: 1782319

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: E1330

Level: (low/med) LOW

Date Received: 08/12/93

% Moisture: not dec. ____

Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ________ (uL)

Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000028

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-15

Lab Name: NYTEST ENV INC   Contract: 9320279

Lab Code: NYTEST   Case No.: 17823   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: 1782305

Sample wt/vol: 5.0 (g/mL) ML   Lab File ID: E1313

Level: (low/med) LOW   Date Received: 08/12/93

% Moisture: not dec. ____   Date Analyzed: 08/17/93

GC Column: PACK   ID: 2.00 (mm)   Dilution Factor: 1.0

Soil Extract Volume: ______ (uL)   Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	1	J
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	3	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-15

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782305

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1313

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000030

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-16

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782304

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1312

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	6	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-16

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782304

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1312

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000032

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-2

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782303

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1311

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	2	J
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	2	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-2

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: 1782303

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: E1311

Level: (low/med) LOW

Date Received: 08/12/93

% Moisture: not dec. ____

Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ______ (uL)

Soil Aliquot Volume: ______ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-3

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782301

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1306

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/16/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	21	
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	6	J
67-66-3	Chloroform	23	
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	14	
56-23-5	Carbon Tetrachloride	45	
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	8200	E
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	15	
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	1	J
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-3

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782301

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1306

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/16/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____(uL)

CONCENTRATION UNITS:

Number TICs found: 3 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN ALKENE	24.03	5	J
2.	UNKNOWN	25.10	39	J
3.	UNKNOWN ALKANE	27.93	28	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-3DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782301

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1342

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 5000.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	50000	U
74-83-9	Bromomethane	50000	U
75-01-4	Vinyl Chloride	50000	U
75-00-3	Chloroethane	50000	U
75-09-2	Methylene Chloride	50000	U
67-64-1	Acetone	50000	U
75-15-0	Carbon Disulfide	50000	U
75-35-4	1,1-Dichloroethene	50000	U
75-34-3	1,1-Dichloroethane	50000	U
540-59-0	1,2-Dichloroethene (total)	50000	U
67-66-3	Chloroform	50000	U
107-06-2	1,2-Dichloroethane	50000	U
78-93-3	2-Butanone	50000	U
71-55-6	1,1,1-Trichloroethane	50000	U
56-23-5	Carbon Tetrachloride	50000	U
75-27-4	Bromodichloromethane	50000	U
78-87-5	1,2-Dichloropropane	50000	U
10061-01-5	cis-1,3-Dichloropropene	50000	U
79-01-6	Trichloroethene	340000	D
124-48-1	Dibromochloromethane	50000	U
79-00-5	1,1,2-Trichloroethane	50000	U
71-43-2	Benzene	50000	U
10061-02-6	trans-1,3-Dichloropropene	50000	U
75-25-2	Bromoform	50000	U
108-10-1	4-Methyl-2-Pentanone	50000	U
591-78-6	2-Hexanone	50000	U
127-18-4	Tetrachloroethene	50000	U
79-34-5	1,1,2,2-Tetrachloroethane	50000	U
108-88-3	Toluene	50000	U
108-90-7	Chlorobenzene	50000	U
100-41-4	Ethylbenzene	50000	U
100-42-5	Styrene	50000	U
1330-20-7	Xylene (total)	50000	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-3DL

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782301

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1342

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 5000.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	5.07	29000	J

0000038

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-4

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782318

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1338

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	54	
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	16	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-4

Lab Name: NYTEST ENV INC   Contract: 9320279

Lab Code: NYTEST   Case No.: 17823   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: 1782318

Sample wt/vol: 5.0 (g/mL) ML   Lab File ID: E1338

Level: (low/med) LOW   Date Received: 08/12/93

% Moisture: not dec. ____   Date Analyzed: 08/19/93

GC Column: PACK   ID: 2.00 (mm)   Dilution Factor: 1.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0   (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000040

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-5

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782314

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1325

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	7	J
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	200	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	3	J
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-5

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782314

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1325

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000042

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-6

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782311

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1341

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 5.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	50	U
74-83-9	Bromomethane	50	U
75-01-4	Vinyl Chloride	50	U
75-00-3	Chloroethane	50	U
75-09-2	Methylene Chloride	50	U
67-64-1	Acetone	50	U
75-15-0	Carbon Disulfide	50	U
75-35-4	1,1-Dichloroethene	50	U
75-34-3	1,1-Dichloroethane	50	U
540-59-0	1,2-Dichloroethene (total)	50	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
78-93-3	2-Butanone	50	U
71-55-6	1,1,1-Trichloroethane	50	U
56-23-5	Carbon Tetrachloride	50	U
75-27-4	Bromodichloromethane	50	U
78-87-5	1,2-Dichloropropane	50	U
10061-01-5	cis-1,3-Dichloropropene	50	U
79-01-6	Trichloroethene	420	
124-48-1	Dibromochloromethane	50	U
79-00-5	1,1,2-Trichloroethane	50	U
71-43-2	Benzene	50	U
10061-02-6	trans-1,3-Dichloropropene	50	U
75-25-2	Bromoform	50	U
108-10-1	4-Methyl-2-Pentanone	50	U
591-78-6	2-Hexanone	50	U
127-18-4	Tetrachloroethene	50	U
79-34-5	1,1,2,2-Tetrachloroethane	50	U
108-88-3	Toluene	50	U
108-90-7	Chlorobenzene	50	U
100-41-4	Ethylbenzene	50	U
100-42-5	Styrene	50	U
1330-20-7	Xylene (total)	50	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782311

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1341

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/19/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 5.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-7

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 1782310

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1318

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MW-7

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782310

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1318

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

Number TICs found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	34.70	7	J

0000046

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-8

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782307

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1315

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-8

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782307

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1315

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000048

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-9

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782315

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1326

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/18/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000050

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SEEP

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782313

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1320

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	29	
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SEEP

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782313

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1320

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/17/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ______ (uL) Soil Aliquot Volume: ____ (uL)

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIPBLK

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782320

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1305

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/16/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIPBLK

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: 1782320

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: E1305

Level: (low/med) LOW Date Received: 08/12/93

% Moisture: not dec. ____ Date Analyzed: 08/16/93

GC Column: PACK ID: 2.00 (mm) Dilution Factor: 1.0

Soil Extract Volume: ________ (uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000054

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK49

Lab Name: NYTEST ENV INC Contract: 9320279

Lab Code: NYTEST Case No.: 17823 SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: VBLK49

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: E1304

Level: (low/med) LOW

Date Received: ______

% Moisture: not dec. ____

Date Analyzed: 08/16/93

GC Column: PACK ID: 2.00 (mm)

Dilution Factor: 1.0

Soil Extract Volume: ______ (uL)

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VBLK49

Lab Name: NYTEST ENV INC   Contract: 9320279

Lab Code: NYTEST   Case No.: 17823   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: VBLK49

Sample wt/vol: 5.0 (g/mL) ML   Lab File ID: E1304

Level: (low/med) LOW   Date Received: ________

% Moisture: not dec. ____   Date Analyzed: 08/16/93

GC Column: PACK   ID: 2.00 (mm)   Dilution Factor: 1.0

Soil Extract Volume: ________ (uL)   Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS:

Number TICs found: 0   (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

0000056

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/16/93
ANALYSIS DATE: 9/5/93

SAMPLE ID: PS-1
LAB SAMPLE ID: 1782321
DIL FACTOR: 1.00
% MOISTURE: 10

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	89.000 U.
22	11104-28-2	Aroclor-1221	89.000 U.
23	11141-16-5	Aroclor-1232	89.000 U.
24	53469-21-9	Aroclor-1242	89.000 U.
25	12672-29-6	Aroclor-1248	89.000 U.
26	11097-69-1	Aroclor-1254	180.000 U.
27	11096-82-5.	Aroclor-1260	180.000 U.

1 D-T

NYTEST ENVIRONMENTAL INC.

TCL PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/16/93
ANALYSIS DATE: 9/5/93

SAMPLE ID: PS-2
LAB SAMPLE ID: 1782322
DIL FACTOR: 1.00
% MOISTURE: 13

CMPD #	CAS Number	PESTICIDE/PCB COMPOUND	UG/KG (DRY BASIS)
1	319-84-6	alpha-BHC	NA
2	319-85-7	beta-BHC	NA
3	319-86-8	delta-BHC	NA
4	58-89-9	gamma-BHC(Lindane)	NA
5	76-44-8	Heptachlor	NA
6	309-00-2	Aldrin	NA
7	1024-57-3	Heptachlor Epoxide	NA
8	959-98-8	Endosulfan I	NA
9	60-57-1	Dieldrin	NA
10	72-55-9	4,4'-DDE	NA
11	70-20-8	Endrin	NA
12	33213-65-9	Endosulfan II	NA
13	72-54-8	4,4-DDD	NA
14	1031-07-8	Endosulfan Sulfate	NA
15	50-29-3	4,4'-DDT	NA
16	72-43-5	Methoxychlor	NA
17	53494-70-5	Endrin Ketone	NA
18	7421-36-3	Endrin Aldehyde	NA
19	57-74-9	Chlordane	NA
20	8001-35-2	Toxaphene	NA
21	12674-11-2	Aroclor-1016	92.000 U.
22	11104-28-2	Aroclor-1221	92.000 U.
23	11141-16-5	Aroclor-1232	92.000 U.
24	53469-21-9	Aroclor-1242	92.000 U.
25	12672-29-6	Aroclor-1248	92.000 U.
26	11097-69-1	Aroclor-1254	180.000 U.
27	11096-82-5	Aroclor-1260	180.000 U.

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12699 Client: STEARNS & WHELER PAGE: 1

Sample Information Cust ID:	BB-5A		BB-5B		BB-6A		BB-6B		BB-6C		DUP	
Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		WATER	
D.F.:	1		1		1		1		1		1	
Units:	ug/kg		ug/kg		ug/kg		ug/kg		ug/kg		ug/L	
		fl		fl		fl		fl		fl		fl
Chloromethane												
Bromomethane												
Vinyl Chloride												
Chloroethane												
Methylene Chloride	24	U	22	U	13	U	32	U	22	U	10	U
Acetone	20	U	18	U	13	U			14	U		
Carbon Disulfide												
1,1-Dichloroethene												
1,1-Dichloroethane												
1,2-Dichloroethene												
Chloroform												
1,2-Dichloroethane												
2-Butanone	2	J										
1,1,1-Trichloroethane												
Carbon Tetrachloride												
Bromodichloromethane												
1,2-Dichloropropane												
Trans-1,3-Dichloropropene												
Trichloroethene			0.8	J								
Dibromochloromethane												
1,1,2-Trichloroethane												
Benzene												
cis-1,3-Dichloropropene												
Bromoform												
4-Methyl-2-pentanone												
2-Hexanone												

Case Number: 12699 Client: STEARNS & WHELER PAGE: 1

Cust ID:	BB-5A	fl	BB-5B	fl	BB-6A	fl	BB-6B	fl	BB-6C	fl	DUP	fl
Tetrachloroethene..................												
1,1,2,2-Tetrachloroethane...........												
Toluene............................												
Chlorobenzene......................												
Ethylbenzene.......................												
Styrene............................												
Total Xylenes......................												

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12699 Client: STEARNS & WHELER

Sample Information

Cust ID:	ST-1	SW-1	SW-2	SW-3	SW-4	SW-5
Matrix:	SOIL	WATER	WATER	WATER	WATER	WATER
D.F.:	1	1	1	1	1	1
Units:	ug/kg	ug/L	ug/L	ug/L	ug/L	ug/L
	fl	fl	fl	fl	fl	fl
Chloromethane						
Bromomethane						
Vinyl Chloride						
Chloroethane						
Methylene Chloride	12 U	10 U	10 U	10 U	10 U	10 U
Acetone	12 U			25 U	29 U	32 U
Carbon Disulfide						
1,1-Dichloroethene						
1,1-Dichloroethane						
1,2-Dichloroethene						
Chloroform						
1,2-Dichloroethane						
2-Butanone						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloromethane						
1,2-Dichloropropane						
Trans-1,3-Dichloropropene						
Trichloroethene					3 J	
Dibromochloromethane						
1,1,2-Trichloroethane						
Benzene						
cis-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-pentanone						
2-Hexanone						

Case Number: 12699 Client: STEARNS & WHELER

Cust ID:	ST-1	SW-1	SW-2	SW-3	SW-4	SW-5
Tetrachloroethene						
1,1,2,2-Tetrachloroethane						
Toluene						
Chlorobenzene						
Ethylbenzene						
Styrene						
Total Xylenes						

ATTACHMENT II
DATA SUMMARY

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS. [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2-butanone in the VOA analyses, and common phthalates in the BNA analyses) or less than 5 times the blank level for other target compounds or tentatively identified compounds.]

R = UNUSABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND. RESULT IS CONSIDERED AS NOT PRESENT IN THE SAMPLE.(i.e. A sample result was not confirmed in the Pesticide/PCB analysis)

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

WESTON
MANAGERS DESIGNERS/CONSULTANTS
1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

ORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
CASE: 12699

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: Kelly Muir Spittler 8-11-92
Kelly Muir Spittler Date
Unit Leader - Data Validation

VERIFIED BY: Kelly Muir Spittler 8-11-92
for Zohreh Hamid, Ph.D. Date
Section Manager - Data Validation

STEARNS & WHELER
CASE: 12699
TCL VOLATILE ORGANICS

INTRODUCTION

This quality assurance review is based upon a review of all data generated from seven water samples, six soil samples, one duplicate and one trip blank collected on 05-28,29-92. The samples were analyzed according to criteria set forth in the NYSDEC ASP 12/91 for TCL Volatile target compounds.

This review has been performed in accordance with the confirmation method. The reported analytical results are presented as a summary of the data in Attachment II. All of the analytical data were examined to determine the usability of the analytical results and also to determine contractual compliance relative to the analytical requirements and deliverables specified in NYSDEC ASP 12/91. The applicable qualifier codes have been placed next to the results in the data summary to indicate the qualitative and/or quantitative reliability. The details of this evaluation review are presented in the narrative section of this report.

All data have been validated with regard to usability according to the quality assurance set forth in NYSDEC ASP 12/91. If you have any questions or comments on this data review, please call Zohreh Hamid or Kelly Spittler at (215) 344-3745

QUALITY ASSURANCE REVIEW

The analyses were performed by NYTEST Environmental, Inc. for samples received on 05-30-92.

The findings offered in this report are based upon a rigorous review of the following criteria:

* • Holding Time
• Blank
* • System Monitoring Compound Recoveries
• Internal Standard
* • GC/MS Tuning
• Calibration
* • Matrix Spike/Spike Duplicate and Matrix Spike Blank Analysis
• Duplicate Analysis
* • Instrument Performance
* • Compound Identification
* • Compound Quantitation
* • Data Completeness

* All criteria were met; therefore, a narrative section is not provided for this classification.

BLANK

The method and trip blanks contained common contaminants methylene chloride and acetone at levels less than 3X the CRQL. Results less than the CRQL are elevated to the CRQL and flagged "U". Results greater than the CRQL, but less than 10X the blank level are also flagged "U" and believed to be artifacts of laboratory contamination. (page E-52, 5.1.1.1 and 5.1.2.1)

INTERNAL STANDARD

The 1,4-difluorobenzene and chlorobenzene internal standard areas were outside the QC limits for sample 02MS. This QC sample was also analyzed as the MSD, which had all internal standard areas outside the QC limits. This sample is exhibiting a matrix effect, however, this soil sample (login 12701) is not part of this sample batch; therefore, it is not reported on the data summary table. The sample data quantified in reference to these outliers are considered estimated. (page E-47, 2.4.5)

CALIBRATION

Based on the criteria established on table 5 (page E-49) all compounds met the %D and RRF criteria in the continuing calibrations. The %RSDs for bromoform (IC 5-13-92) and benzene (IC 06-05-92) exceeded 20.5% Since there was only one outlier per calibration and the %RSDs were less than 40%, the sample data are not qualified on the basis of these outliers. (page E-47, 2.4.4)

DUPLICATE ANALYSIS

Sample ID "DUP" was analyzed with this batch; however, the corresponding sample analysis was not specified. The sample result reproducibility cannot be evaluated.

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid or Kelly Spittler at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.

2. Attachment II - Data Summary.

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

DATA COMPLIANCE

					COMPLIANCY							
ROUP #	**DATE**	**CLP YEAR**	**SAMPLE NO.**	**MATRIX**	**VOA**	**BNA**	**PEST/PCB**	**METALS**	**CN**	**TOTAL PHENOLS**	**PAGE NO. IN THE CLP**	**NON-COMPLIANCY**
12515	8-11-92	3/90	Duplicate	Soil	1	NA	NA	NR	NR	NA		
"	"	"	mw10 (25-5)	Soil	1	↓	↓	↓	↓	↓		1) All Analyses Compliant
"	"	"	mw10 (27-5)	Soil	1	↓	↓	↓	↓	↓		
"	"	"	mw11 (30-32)	Soil	1	↓	↓	↓	↓	↓		

NA = Not Analyzed
NR = Not Reported With Volatiles

Case Number: 12755 Client: STEARNS & WHELER PAGE: 2

Cust ID:	MW-7	MW-8	TRIPBLK
Tetrachloroethene	2 J		
1,1,2,2-Tetrachloroethane			
Toluene			
Chlorobenzene			
Ethylbenzene			
Styrene			
Total Xylenes			

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12755 Client: STEARNS & WHELER PAGE: 2

Sample Information				
	Cust ID:	MW-7	MW-8	TRIPBLK
	Matrix:	WATER	WATER	WATER
	D.F.:	1	1	1
	Units:	ug/L	ug/L	ug/L
Chloromethane				
Bromomethane				
Vinyl Chloride				
Chloroethane				
Methylene Chloride		10 U	10 U	2 J
Acetone				
Carbon Disulfide				
1,1-Dichloroethene				
1,1-Dichloroethane				
1,2-Dichloroethene				
Chloroform				
1,2-Dichloroethane				
2-Butanone				
1,1,1-Trichloroethane				
Carbon Tetrachloride				
Bromodichloromethane				
1,2-Dichloropropane				
Trans-1,3-Dichloropropene				
Trichloroethene				
Dibromochloromethane				
1,1,2-Trichloroethane				
Benzene				
cis-1,3-Dichloropropene				
Bromoform				
4-Methyl-2-pentanone				
2-Hexanone				

Case Number: 12755 Client: STEARNS & WHELER PAGE: 1

Cust ID:	DUP	fl	MW-11DL	fl	MW-12	fl	MW-2	fl	MW-4	fl	MW-6	fl
Tetrachloroethene	1	J									1	J
1,1,2,2-Tetrachloroethane												
Toluene												
Chlorobenzene												
Ethylbenzene												
Styrene												
Total Xylenes												

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12755 Client: STEARNS & WHELER PAGE: 1

Sample Information

Cust ID:	DUP	MW-11DL	MW-12	MW-2	MW-4	MW-6
Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
D.F.:	1/5*	25	1	1	1	1/5*
Units:	ug/L fl	ug/L fl	ug/L fl	ug/L fl	ug/L fl	ug/L fl
Chloromethane						
Bromomethane						
Vinyl Chloride						
Chloroethane						
Methylene Chloride		250 U	10 U		10 U	
Acetone						
Carbon Disulfide						
1,1-Dichloroethene						
1,1-Dichloroethane						
1,2-Dichloroethene	4 J				9 J	4 J
Chloroform						
1,2-Dichloroethane						
2-Butanone						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloromethane						
1,2-Dichloropropane						
Trans-1,3-Dichloropropene						
Trichloroethene	450 *	5200	36		6 J	510 *
Dibromochloromethane						
1,1,2-Trichloroethane						
Benzene						
cis-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-pentanone						
2-Hexanone						

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS. [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2-butanone in the VOA analyses, and common phthalates in the BNA analyses) or less than 5 times the blank level for other target compounds or tentatively identified compounds.]

R = UNUSABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND. RESULT IS CONSIDERED AS NOT PRESENT IN THE SAMPLE.(i.e. A sample result was not confirmed in the Pesticide/PCB analysis)

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

ATTACHMENT II
DATA SUMMARY

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid or Kelly Spittler at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.
2. Attachment II - Data Summary.

BLANK

The method blank (VBLK E38) and trip blank contained common contaminant methylene chloride at levels less than the CRQL. All positive sample results less than the CRQL are elevated to the CRQL and flagged "U". Positive results greater than the CRQL, but less than 10X the blank level are believed to be artifacts of laboratory contamination and are also flagged "U". (page E-52, 5.1.1.1)

CALIBRATION

Based on the criteria established on table 5 (page E-49) all relative response factors were within the criteria in both initial and continuing calibrations. The %RSD for bromoform (IC 05-13-92) exceeded 20.5% and the %Ds for 1,1,1-trichloroethene (all CCs) and trans-1,3-dichloropropene (CC 06-11-92 @ 21:00) exceeded 25%. Since there was no more than two outliers per calibration and the %RSD and %Ds were less than 40%, the sample data is not qualified on the basis of these outliers. (page E-47, 2.4.4)

MATRIX SPIKE/SPIKE DUPLICATE AND MATRIX SPIKE BLANK

A matrix spike/spike duplicate and matrix spike blank analyses were not provided with this batch of samples. These QC analyses were performed in cases 12550 and 12699. The frequency requirements are specified on page E-56 7.1, this sample data has not been qualified in reference to these missing QC analyses.

DUPLICATE ANALYSIS

Sample ID "DUP" was analyzed with this batch; however the corresponding sample analysis was not specified. The sample result reproducibility cannot be evaluated.

COMPOUND QUANTITATION

Samples DUP, MW-11 and MW-6 were reanalyzed at higher levels of dilutions because trichloroethene exceeded the calibration range on the original analyses. The diluted analyses are only to be used for this compound in samples DUP and MW-6. For sample MW-11, the diluted analysis is to be used as the representative results. (page E-60, 8)

DATA COMPLIANCE

ROUP #	DATE	CLP YEAR	SAMPLE NO.	MATRIX	COMPLIANCY VOA	BNA	PEST/PCB	METALS	CN	TOTAL PHENOLS	PAGE NO. IN THE CLP	NON-COMPLIANCY
12755	8-11-92	3/90	DUP	WATER	1	NA	NA	NA	NA	NA		
"	"	"	MW-11DL	"	1	↓	↓	↓	↓	↓		1) ALL ANALYSES COMPLIANT
"	"	"	MW-12	"	1	↓	↓	↓	↓	↓		
"	"	"	MW-2	"	1	↓	↓	↓	↓	↓		
"	"	"	MW-4	"	1	↓	↓	↓	↓	↓		
"	"	"	MW-6	"	1	↓	↓	↓	↓	↓		
"	"	"	MW-7	"	1	↓	↓	↓	↓	↓		
"	"	"	MW-8	"	1	↓	↓	↓	↓	↓		
"	"	"	TRIP BLK	"	1	↓	↓	↓	↓	↓		

6

WESTON
MANAGERS DESIGNERS CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

ORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
CASE 12802

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: Kelly Muir Spittler 8-17-92
Kelly Muir/Spittler Date
Unit Leader - Data Validation

VERIFIED BY: 8-17-92
Zohreh Hamid, Ph.D. Date
Section Manager - Data Validation

WESTON

STEARNS & WHELER
CASE: 12802
TCL VOLATILE ORGANICS

INTRODUCTION

This quality assurance review is based upon a review of all data generated from seven soil samples, five water samples and one trip blank collected on 06-04-92. The samples were analyzed according to criteria set forth in the NYSDEC ASP 12/91 for TCL Volatile target compounds.

This review has been performed in accordance with the confirmation method. The reported analytical results are presented as a summary of the data in Attachment II. All of the analytical data were examined to determine the usability of the analytical results and also to determine contractual compliance relative to the analytical requirements and deliverables specified in the NYSDEC ASP 12/91. The applicable qualifier codes have been placed next to the results in the data summary to indicate the qualitative and/or quantitative reliability. The details of this evaluation review are presented in the memo section of this report.

All data have been validated with regard to usability according to the quality assurance set forth in the NYSDEC ASP 12/91. If you have any questions or comments on this data review, please call Zohreh Hamid or Kelly Spittler at (215) 344-3745

QUALITY ASSURANCE REVIEW

The analyses were performed by NYTEST Environmental, Inc. for samples received on 06-06-92.

The finding offered in this report are based upon a rigorous of the following criteria:

*	•	Holding Time
	•	Blank
*	•	System Monitoring Compound Recoveries
*	•	Internal Standard
*	•	GC/MS Tuning
	•	Calibration
	•	Matrix Spike/Spike Duplicate and Matrix Spike Blank Analyses
	•	Duplicate Analysis
*	•	Instrument Performance
*	•	Compound Identification
	•	Compound Quantitation
*	•	Data Completeness

* All criteria were met; therefore, a narrative section is not provided for this classification.

BLANK

The method and trip blanks contained methylene chloride, acetone, 2-butanone, trichloroethene, 4-methyl-2-pentanone, and 2-hexanone. Results less than the CRQL are reported at the CRQL and flagged "U". Results greater than the CRQL but less than 10X (common contaminants) the blank levels are also flagged "U" and believed to be laboratory artifacts. All results greater than 10X (common contaminants) or 5X (other target compounds) the blank levels are considered to be true values. (page E-52, 5.1.1.1 and 5.1.1.2)

CALIBRATION

Based on the criteria established on table 5 (page E-49), all compounds met the relative response factor criteria in the initial and continuing calibrations. The %RSD's and %D's for bromoform (IC 5-28-92), benzene (IC 6-5-92), 1,1-dichloroethane (CC 6-12-92) and chloroform (CC 6-12-92) exceeded the 20.5% and 25% QC limits, respectively. Since there were less than two outliers per calibration and the %RSD's and %D's were less than 40%, the sample data are not qualified on the basis of these outliers. (page E-47, 2.4.4)

MATRIX SPIKE/SPIKE DUPLICATE AND MATRIX SPIKE BLANK ANALYSES

The following spike recoveries and RPD results were outside the QC limits:

SAMPLE	MS/MSD/RPD	COMPOUND
MW-5	MS/MSD/RPD	Trichloroethene
BB-3A	MS	1,1-Dichloroethene

Trichloroethene was detected in sample MW-5; this sample result may be biased; therefore this positive result is considered estimated. (page E-58, 5.5)

DUPLICATE ANALYSIS

Sample ID "DUP" was analyzed with this batch; however, the corresponding sample analysis was not identified. The sample result reproducibility cannot be evaluated.

COMPOUND QUANTITATION

Samples MW-10 (50X) and MW-5 (5X) were reanalyzed at higher levels of dilution because trichloroethene exceeded the calibration range on the original analysis. The diluted result is only to be used for this compound, all other results are reported from the original analysis. Sample MW-3 was reported at a 5000-fold dilution. Sample results may be biased; however, no specific action has been taken on the data summary.

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid or Kelly Spittler at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.

2. Attachment II - Data Summary.

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

R = UNRELIABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND WAS CONSIDERED AS NOT PRESENT IN THE SAMPLE.

(NO CODE) = CONFIRMED IDENTIFICATION

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

ATTACHMENT II
DATA SUMMARY

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12802 Client: STEARNS & WHELER PAGE: 1

Sample Information	Cust ID:	BB-1A	BB-2A	BB-2B	BB-3A	BB-3B	BB-4A
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1	1	1	1	1	1
	Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
		fl	fl	fl	fl	fl	fl
Chloromethane							
Bromomethane							
Vinyl Chloride							
Chloroethane							
Methylene Chloride		12 U	13 U	12 U	21 U	12 U	11 U
Acetone		12 U		12 U	36 U	12 U	
Carbon Disulfide							
1,1-Dichloroethene							
1,1-Dichloroethane							
Trans-1,2-Dichloroethene					2 J		
Chloroform							
1,2-Dichloroethane							
2-Butanone					14 U		
1,1,1-Trichloroethane							
Carbon Tetrachloride							
Bromodichloromethane							
1,2-Dichloropropane							
Trans-1,3-Dichloropropene							
Trichloroethene							
Dibromochloromethane							
1,1,2-Trichloroethane							
Benzene							
cis-1,3-Dichloropropene							
Bromoform							
4-Methyl-2-pentanone							
2-Hexanone							

Case Number: 12802 Client: STEARNS & WHELER PAGE: 1

Cust ID:	BB-1A	BB-2A	BB-2B	BB-3A	BB-3B	BB-4A
Tetrachloroethene..................						
1,1,2,2-Tetrachloroethane...........						
Toluene............................						
Chlorobenzene......................						
Ethylbenzene.......................						
Styrene............................						
Total Xylenes......................						

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12802　　Client: STEARNS & WHELER　　

Cust ID:	BB-4B	fl	DUP	fl	MW-10	fl	MW-3	fl	MW-5	fl	MW-9	fl
Sample Information												
Matrix:	SOIL		SOIL		WATER		WATER		WATER		WATER	
D.F.:	1		1		1/50*		5000		1/5*		1	
Units:	ug/kg		ug/kg		ug/L		ug/L		ug/L		ug/L	
Chloromethane												
Bromomethane												
Vinyl Chloride												
Chloroethane												
Methylene Chloride	17	U	6	U	10	U	16000	J	10	U	6	J
Acetone			8	U			77000					
Carbon Disulfide												
1,1-Dichloroethene												
1,1-Dichloroethane												
Trans-1,2-Dichloroethene									6	J		
Chloroform												
1,2-Dichloroethane												
2-Butanone												
1,1,1-Trichloroethane												
Carbon Tetrachloride												
Bromodichloromethane												
1,2-Dichloropropane												
Trans-1,3-Dichloropropene												
Trichloroethene					4500	*	340000		110	J*	60	
Dibromochloromethane												
1,1,2-Trichloroethane												
Benzene												
cis-1,3-Dichloropropene												
Bromoform												
4-Methyl-2-pentanone							18000	J				
2-Hexanone					3	J	26000	J				

Case Number: 12802 Client: STEARNS & WHELER PAGE: 2

Cust ID:	BB-4B	DUP	MW-10	MW-3	MW-5	MW-9
Tetrachloroethene....................					4 J	
1,1,2,2-Tetrachloroethane...........				6600 J		
Toluene.............................				3000 J		
Chlorobenzene.......................						
Ethylbenzene........................						
Styrene.............................						
Total Xylenes.......................						

WESTON ANALYTICS
GC/MS DATA SUMMARY
VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS

Case Number: 12802 Client: STEARNS & WHELER PAGE: 3

	Cust ID:	TRIP BLK	WB-1
Sample Information	Matrix:	WATER	WATER
	D.F.:	1	1
	Units:	ug/L	ug/L
Chloromethane			
Bromomethane			
Vinyl Chloride			
Chloroethane			
Methylene Chloride		10 U	10 U
Acetone			
Carbon Disulfide			
1,1-Dichloroethene			
1,1-Dichloroethane			
Trans-1,2-Dichloroethene			
Chloroform			
1,2-Dichloroethane			
2-Butanone			
1,1,1-Trichloroethane			
Carbon Tetrachloride			
Bromodichloromethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichloroethane			
Benzene			
cis-1,3-Dichloropropene			
Bromoform			
4-Methyl-2-pentanone			
2-Hexanone			1 J

```
                    Cust ID: TRIP BLK      WB-1

=============================================fl=========fl=========fl=========fl=========fl=========fl
Tetrachloroethene...................
1,1,2,2-Tetrachloroethane...........
Toluene.............................
Chlorobenzene.......................
Ethylbenzene........................
Styrene.............................
Total Xylenes.......................
```

WESTON

STEARNS & WHELER
CASE 12755
SDG NO.: SDG 656

Case Summary

This case consisted of eight (8) soil samples and thirteen (13) water samples received by Nytest Environmental, Inc. (NEI) on 6-4,6-92. These samples were analyzed for Target Analyte List Metals according to Contract Laboratory Program SOW 3,90. Twelve of thirteen water samples were analyzed for total and dissolved analyses.

All data have been validated with regard to usability according to the quality assurance guidelines set forth by NYSDEC Analytical Services protocol 9,89 (12,91 revisions). If you have any questions or comments on this data review, please contact Zohreh Hamid at (215) 525-3745.

The data are evaluated based on the following parameters:

- Data Completeness
- * Holding Times
- Calibration
- Laboratory and Field Blanks
- * ICP Interference Check Samples
- Matrix Spike/Spike Duplicate
- Laboratory and Field Duplicate
- * Laboratory Control Samples
- Furnace Atomic Absorption Results
- Serial Dilution Samples
- * Detection Limits
- * Overall Sample Results

* All criteria were met for this parameter.

Data Completeness

The calibration and preparation blank results for analysis of mercury was not listed on Form III. The laboratory has been contacted. The laboratory corrected the soil preparation blank for mercury (attachment III); however, the calibration blanks and the water preparation blank data are not included. The form III should be corrected and resubmitted by the laboratory. The pH for the water samples are reported as > 2 pH units. The pH should be ≤ 2 units. This discrepancy should be clarified by the laboratory.

The spike recovery for Mn (166.2%) exceeded the QC limit in the analysis of total samples. This analyte was not flagged with N on Form 1's for the associated sample. The form 1 should be corrected and resubmitted.

Calibration Analysis

The percent recovery for Cr (68.4/67.8) was less than 80% in CRDL standard analysis. The CLP analysis requirement limit has not been promulgated by NYSDEC ASP (E-133-3); therefore, the data are not impacted based on this outlier.

Laboratory and Field Blank Analysis

The calibration blanks contained Fe, Mn, and Be at levels above IDL and less than CRDL. The soil preparation blank contained Al, and Fe at below the negative IDLs. These analytes were detected in the soil samples at levels above the action levels, with the exception of Be which results are qualified "U" for the soil samples. Therefore, for Mn and Fe, the data are not qualified. The water preparation blank contained Be, Fe, and Mn at below the negative IDLs. The reported results for these analytes which are ≥IDL but less than 5X the absolute blank levels are qualified estimated. (E-135)

Matrix Spike Analysis

The percent recoveries for Sb (72.2%), Pb (21%) and Ag (64%) were below the lower QC limit of 75% in soil matrix spike analysis. The reported results ≥IDLs are qualified estimated. The sample results for As was not correctly listed on Form V. The evaluator recalculated the spike recovery. The spike recovery for As (65%) is less than 75% QC limit. The reported data are qualified estimated. The laboratory should correct the Form V and resubmit this form for the data package completeness. The spike recoveries for Fe (153.5%), Pb (125.5%), Mn (166.2%) Hg (61%), and Ag (59.4) were outside the QC limit of ±25% in total analysis. The reported results for Fe, Pb and Mn are biased high and are qualified estimated. Also, the reported data ≥IDLs for Hg and Ag are considered biased low and are qualified estimated for the associated samples.

The spike recovery for As (67.5%) and Hg (72%) were below the lower QC limit of 75% in dissolved sample analysis. The reported results are biased low and are qualified estimate in the data summary for the corresponding samples. (E-137)

Laboratory Matrix Duplicate Analysis

The RPD for Pb (38.2%) and Mn (20.7) in soil samples and Al (51.6) and Zn (104.6%) in total sample analysis were above 20% requirement limits. The reported results are qualified estimated. (E-139) The duplicate analysis for Hg was not reported on the Form VI for any matrices. The review of the raw data showed that the duplicate analysis has been performed and RPDs were within the QC limit; therefore, the data are accepted, however, the Form s VI should be corrected and resubmitted.

The two field duplicate sample IDLs were included in the data package. However, the corresponding field duplicate was not identified. Therefore, the validator was not able to evaluate the field precision.

Furnace Atomic Absorption Results

Samples BB002B, BB001A, and BB0DUP were analyzed by MSA for lead. The correlation coefficient met the linearity. Samples BB002A and BB003A were flagged with an "S" on Form 1 however, sample BB0DUP was not flagged as required by CLP. The reported Form 1 should be corrected and resubmitted by the laboratory (E-145).

The following samples analyzed by graphite furnace had analytical/spike recoveries outside the QC range 85-115% (E-144):

SAMPLE ID	ANALYTE	% RECOVERY
BB001A	As/Se	78/84
BB002A	As	78*
BB002B	Se	83
BB003A	As	82
BB003B	As/Tl	82/82
BB004A	As	79
BB004B	As	80
BB0DUP	As	77
DDUPXX	As/Tl	77/119
DMW002	As	83
DMW004	As/Tl	82/129
DMW006	As/Tl	76/116
DMW008	As, Se	84/78
DMW011	As/Pb/Tl	80/116/118
DMW012	As/Tl	80/121
MW0004	Tl	126
MW0006	Tl	116
MW0007	As/Se/Pb	80/83/116
MW0008	As/Pb/Se	80/120/83
MW0009	Se/Tl	77*/82
MW0011	As/Pb	82/119
MW0010	Se	134*

* Was not flagged with a "W" on form 1, as required. The form should be resubmitted.

The Tl has analytical spike recovery above the upper QC limit of 115% with the exception of samples BB003B and MW0009. The reported IDL for this analyte is qualified estimated in these two samples.

Also, the reported results ≥IDL for As, Pb, and Se are qualified estimated in the corresponding samples.

Serial Dilution Analysis

The ICP serial dilution for Mn was above 10% requirement limit in soil sample analysis. The reported sample results are considered estimated (E-141).

Sample Results

The sample results ≥ IDL, but less than the CRDL, are qualified estimated "J" due to the uncertainty near the detection limits.

Overall Summary

The data quality are fair and could be accepted with the applied qualifier codes. The major problems were encountered with data package completeness. The data are not flagged appropriately and the results for blank and laboratory duplicate analysis for Hg were not included in the data package. Also, there are some transcription errors that are corrected and noted by the validator.

WESTON.
MANAGERS DESIGNERS/CONSULTANTS

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.
2. Attachment II - Data Summary.
3. Attachment III - Resubmission

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

R = UNRELIABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND WAS CONSIDERED AS NOT PRESENT IN THE SAMPLE.

(NO CODE) = CONFIRMED IDENTIFICATION

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

ATTACHMENT II
DATA SUMMARY

DATA COMPLIANCE

Page 1 of 3

IROUP #	DATE	CLP YEAR	SAMPLE NO.	MATRIX	COMPLIANCY VOA	BNA	PEST/PCB	METALS	CN	TOTAL PHENOLS	PAGE NO. IN THE CLP	NON-COMPLIANCY
12755	3-22	3/90	BB001A	Soil	NA	NA	NA	1	NA	NA		
"	"	"	BB002A	"	"	"	"	1	"	"		1- Data quality was fair and the reported results should be accepted with the applied qualifier codes. The missing information about Hg should be resubmitted by the laboratory.
"	"	"	BB002B	"	"	"	"	1	"	"		
"	"	"	BB003A	"	"	"	"	1	"	"		
"	"	"	BB003B	"	"	"	"	1	"	"		
"	"	"	BB004A	"	"	"	"	1	"	"		
"	"	"	BB004B	"	"	"	"	1	"	"		
"	"	"	BB0DUP	"	"	"	"	1	"	"		

DATA COMPLIANCE

Page 2/3

		CLP	SAMPLE		C O M P L I A N C Y					TOTAL	PAGE NO. IN	
ROUP #	DATE	YEAR	NO.	MATRIX	VOA	BNA	PEST/PCB	METALS	CN	PHENOLS	THE CLP	NON-COMPLIANCY
12755	8,92	3-90	DDUPXX	water	NA	NA	NA	'	NA	NA		
〃	〃	〃	DMW002	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW003	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW004	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW005	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW006	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW007	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW008	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW009	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW010	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW011	〃	〃	〃	〃	'	〃	〃		
〃	〃	〃	DMW012	〃	〃	〃	〃	'	〃	〃		

Dissolve Analysis

DATA COMPLIANCE

Page 3/3

					COMPLIANCY							
IROUP #	DATE	CLP YEAR	SAMPLE NO.	MATRIX	VOA	BNA	PEST/PCB	METALS	CN	TOTAL PHENOLS	PAGE NO. IN THE CLP	NON-COMPLIANCY
12755	8,92	3,90	DUPXXX	water	NA	NA	NA	1	NA	NA		
"	"	"	MW0002	"	"	"	"	1	"	"		
"	"	"	MW0003	"	"	"	"	1	"	"		
"	"	"	MW0004	"	"	"	"	1	"	"		
"	"	"	MW0005	"	"	"	"	1	"	"		
"	"	"	MW0006	"	"	"	"	1	"	"		
"	"	"	MW0007	"	"	"	"	1	"	"		
"	"	"	MW0008	"	"	"	"	1	"	"		
"	"	"	MW0009	"	"	"	"	1	"	"		
"	"	"	MW0010	"	"	"	"	1	"	"		
"	"	"	MW0011	"	"	"	"	1	"	"		
"	"	"	MW0012	"	"	"	"	1	"	"		

Total Analysis

Page 1

CASE NUMBER: 12755 SDG # SDG-656

CLIENT NAME: Stearns & Wheler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	BB001 A		BB002 A		BB002 B		BB003 A		BB003 B		BB004 A	
MATRIX:	Soil		Soil		Soil		Soil		Soil		Soil	
UNITS:	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Aluminum	5830		6650		6480		5430		4870		5850	
Antimony	17.5	J		UJ		UJ		UJ		UJ		UJ
Arsenic	1.8	J	1.5	J		UJ	1.9	J	1.7	J	1.6	J
Barium	43.3	J	208		422		49.1	J	24.8	J	58.4	J
Beryllium	0.33	U			0.24	U	0.42	U				
Cadmium												
Calcium	168000		115000		139000		93100		146000		107000	
Chromium	2.4	J	4.2		3.5							
Cobalt	5.0	J	5.6	J	4.6	J	4.6	J	2.8	J	3.9	J
Copper	4.7	J	6.4		3.9	J	11.5		7.1		4.9	J
Iron	9980		9600		9970		9880		7960		8680	
Lead	9.0	J	6.8	J	7.7	J	14.9	J	5.1	J	14.9	J
Magnesium	39800		21700		25800		20,000		30200		18200	
Manganese	287	J	215	J	239	J	202	J	271	J	224	J
Mercury												
Nickel	11.5		10.3		12.6		8.8	J	8.3	J	8.5	J
Potassium	980	J	1600		1080	J	1230	J	1180	J	1440	J
Selenium		UJ				UJ						
Silver		UJ	3.4	J		UJ		UJ		UJ		UJ
Sodium												
Thallium										UJ		
Vanadium	12.2		13.5		11.9		12.1	J	10.3	J	11.5	J
Zinc	49.7		59.9		44.9		62.6		36.2		75.4	
Cyanide		Q		Q		Q		Q		Q		Q

Q: not analyzed

Page 2

CASE NUMBER: 12755 SDG # SDG656

CLIENT NAME: Stearns & Wheler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	BB004B		BB0DUP									
MATRIX:	Soil		Soil									
UNITS:	Mg/Kg		Mg/Kg									
Aluminum	6150		5000									
Antimony		UJ		UJ								
Arsenic	1.7	J	1.5	J								
Barium	73.9		32.6	J								
Beryllium			0.24	U								
Cadmium												
Calcium	143000		150000									
Chromium	3.4											
Cobalt	3.6	J	3.7	J								
Copper	5.2	J	4.1	J								
Iron	8840		9220									
Lead	11.5	J	7.9	J								
Magnesium	18500		45100									
Manganese	249	J	267	J								
Mercury												
Nickel	9.1	J	7.7	J								
Potassium	1150	J	806	J								
Selenium												
Silver		UJ		UJ								
Sodium												
Thallium												
Vanadium	10.8	J	10.4	J								
Zinc	173		47.8									
Cyanide		Q		Q								

Q : Not analyzed.

CASE NUMBER: 12755 SDG #SDG-656

CLIENT NAME: Stearns & wheeler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	DDUPXX		DMW002		DMW003		DMW004		DMW005		DMW006	
MATRIX:	water		water		water		water		water		water	
UNITS:	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum					50.2	J						
Antimony												
Arsenic		UJ		UJ		UJ		UJ		UJ		UJ
Barium	157	J	96.7		29.	J	59.8	J	148	J	159	J
Beryllium		UJ		UJ		UJ		UJ		UJ		UJ
Cadmium												
Calcium	72600		64400		24200		53400		106000		73500	
Chromium												
Cobalt												
Copper												
Iron			168	J								
Lead												
Magnesium	25600		26000		6970		11500		23800		26100	
Manganese			245				1.4	J				
Mercury		UJ		UJ		UJ		UJ		UJ		UJ
Nickel												
Potassium					9480		1820	J				
Selenium												
Silver												
Sodium	3780		13000		21100		4300	J	3770	J	3880	J
Thallium												
Vanadium												
Zinc												
Cyanide		Q		Q		Q		Q		Q		Q

Page 2

CASE NUMBER: 12755 SDG#SDG656 CLIENT NAME: Stearns & Wheler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	BB004B		BB0DUP									
MATRIX:	Soil		Soil									
UNITS:	mg/kg		mg/kg									
Aluminum	6150		5000									
Antimony		UJ		UJ								
Arsenic	1.7	J	1.5	J								
Barium	73.9		32.6	J								
Beryllium			0.24	U								
Cadmium												
Calcium	143000		150000									
Chromium	3.4											
Cobalt	3.6	J	3.7	J								
Copper	5.2	J	4.1	J								
Iron	8840		9220									
Lead	11.5	J	7.9	J								
Magnesium	18500		45100									
Manganese	249	J	267	J								
Mercury												
Nickel	9.1	J	7.7	J								
Potassium	1150	J	806	J								
Selenium												
Silver		UJ		UJ								
Sodium												
Thallium												
Vanadium	10.8	J	10.4	J								
Zinc	173		47.8									
Cyanide		Q		Q								

Q : Not analyzed.

CASE NUMBER: 12755 SDG #SDG-656

CLIENT NAME: Stearns & Wheeler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	DDUPXX		DMW002		DMW003		DMW004		DMW005		DMW006	
MATRIX:	water		water		water		water		water		water	
UNITS:	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum					50.2	J						
Antimony												
Arsenic		UJ		UJ		UJ		UJ		UJ		UJ
Barium	157	J	96.7		29.	J	59.8	J	148	J	159.	J
Beryllium		UJ		UJ		UJ		UJ		UJ		UJ
Cadmium												
Calcium	72600		64400		24200		53400		106000		73500	
Chromium												
Cobalt												
Copper												
Iron			168	J								
Lead												
Magnesium	25600		26900		6970		11500		23800		26100	
Manganese			245				1.4	J				
Mercury		UJ		UJ		UJ		UJ		UJ		UJ
Nickel												
Potassium					9480		1820	J				
Selenium												
Silver												
Sodium	3780		13000		21100		4300	J	3770	J	3880	J
Thallium												
Vanadium												
Zinc												
Cyanide		Q		Q		Q		Q		Q		Q

CASE NUMBER: Case 12755 SDG # SDG 656

CLIENT NAME: Stearns & wheler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	DMW007		DMW008		DMW009		DMW010		DMW011		DMW012	
MATRIX:	water		water		water		water		water		water	
UNITS:	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum												
Antimony												
Arsenic		UJ		UJ		UJ		UJ		UJ		UJ
Barium			40.9	J	159	J	117	J	178	J	134	J
Beryllium	-	UJ		UJ		UJ		UJ		UJ		UJ
Cadmium												
Calcium	466000		61000		72900		49700		69100		61100	
Chromium												
Cobalt												
Copper												
Iron	100	J										
Lead												
Magnesium	44300		57600		22600		19900		28900		27800	
Manganese	15.1	J	6.7	J			6.6	J			58.3	
Mercury		UJ		UJ		UJ		UJ		UJ		UJ
Nickel					59.6							
Potassium	3060	J	2880	J			5210		2720	J	4360	J
Selenium				UJ								
Silver												
Sodium	28200		8650		12900		6140		23300		37500	
Thallium												
Vanadium												
Zinc -												
Cyanide		Q		Q		Q		Q		Q		Q

Q: not analyzed

Page 5

CASE NUMBER: 12755 SDG#SDG-656

CLIENT NAME: Stearns & whaler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	DUP XXX		MW0002		MW0003		MW0004		MW0005		MW0006	
MATRIX:	water		water		water		water		water		water	
UNITS:	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	754	J	966	J	22400	J	544	J	2590	J	1320	J
Antimony												
Arsenic												
Barium	176	J	111	J	198	J	59.5	J	150	J	186	J
Beryllium		UJ		UJ		UJ		UJ		UJ		UJ
Cadmium												
Calcium	74100		69900		119000		50,000		101000		77800	
Chromium					23.5							
Cobalt					11.7	J						
Copper	6.9	J			40.8				11.5	J	12.5	J
Iron	1070	J	3190	J	28600	J	544	J	3040	J	1290	J
Lead					13.6	J			3.4	J		
Magnesium	24500		28300		48400		10700		24700		25800	
Manganese	61.6	J	659	J	654	J	74.4	J	231	J	85.1	J
Mercury		UJ	0.39	J		UJ		UJ		UJ		UJ
Nickel					32.5	J						
Potassium					13300				3360	J	2300	J
Selenium												
Silver		UJ		UJ	15.4	J		UJ		UJ		UJ
Sodium	3760	J	12900		18700		4310	J	3710	J	3950	J
Thallium												
Vanadium					36.6	J						
Zinc -					92.4	J			12.5	J		
Cyanide		Q		Q		Q						

Q: not analyzed

CASE NUMBER: Case 12755 SDG 656

CLIENT NAME: Stearns & Wheler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	MW0007		MW0008		MW0009		MW0010		MW0011		MW0012	
MATRIX:	water		water		water		water		water		water	
UNITS:	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Aluminum	212	J	2540	J	17700	J	3150	J	195	J	15800	J
Antimony					75.3							
Arsenic		UJ		UJ								
Barium			55.8	J	661		134	J	179	J	924	
Beryllium		UJ		UJ	1.3	J		UJ		UJ		UJ
Cadmium												
Calcium	479000		65900		276000		59600		68000		237000	
Chromium					430						37.9	
Cobalt					30.8	J					15.5	J
Copper			21.5	J	67.7		27.1		7.7	J	47.9	
Iron			4280	J	36000	J	4250	J	62.8	J	25800	J
Lead					13.1	J	6.2	J			11.2	J
Magnesium	41900		57600		100,000		25600		28100		84500	
Manganese	13.7	J	118	J	1420	J	66.	J	5.3	J	789	J
Mercury		UJ		UJ		UJ		UJ		UJ		UJ
Nickel			31.9	J	431		21.	J			28.	J
Potassium	3800		3190	J	6630		3330	J	2260	J	8100	
Selenium		UJ		UJ		UJ						
Silver		UJ		UJ		UJ		UJ		UJ		UJ
Sodium	26500		8210		11800		6210		22900		35500	
Thallium						UJ						
Vanadium					35.	J					29.1	J
Zinc			197	J	90.5	J	141	J	137	J	73.6	J
Cyanide		Q		Q		Q		Q		Q		Q

Q: not analyzed

Page 7

CASE NUMBER: CLIENT NAME: Stearns & Wheler

DATA VALIDATION - INORGANIC SUMMARY

LAB/CLIENT ID:	wB0001											
MATRIX:	water											
UNITS:	ug/l											
Aluminum												
Antimony												
Arsenic												
Barium												
Beryllium		UJ										
Cadmium												
Calcium												
Chromium												
Cobalt												
Copper												
Iron												
Lead												
Magnesium												
Manganese												
Mercury		UJ										
Nickel												
Potassium												
Selenium												
Silver		UJ										
Sodium												
Thallium												
Vanadium												
Zinc		[illegible]										
Cyanide		a										

a: Not analyzed

ATTACHMENT III
RESUBMISSION

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT
NEI nytest environmental inc

FAX COVER SHEET

TO: Zohreh Hamid

FAX NO: 215-344-3628.

DATE: 8/25

NO. OF PAGES (Including cover page) 2

FROM: Mike Brennan.

MESSAGE:

NOTE: IF YOU DO NOT RECEIVE THE ENTIRE TRANSMISSION, OR NEED PAGES TO BE RESENT DUE TO ILLEGIBILITY, PLEASE CALL US BACK IMMEDIATELY.

U.S. EPA - CLP

3
BLANKS

Lab Name: NYTEST ENVIRONMENTAL INC. Contract: 9219024

Lab Code: 10195 Case No.: 12755 SAS No.: SDG No.: SDG65

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum		-		-		-		-	-7.220	B	P
Antimony		-		-		-		-	11.040	U	P
Arsenic		-	5.0	U	5.0	U	5.0	U	1.000	U	F
Barium		-		-		-		-	2.920	U	P
Beryllium		-		-		-		-	0.200	U	P
Cadmium		-		-		-		-	0.960	U	P
Calcium		-		-		-		-	202.680	U	P
Chromium		-		-		-		-	1.300	U	P
Cobalt		-		-		-		-	1.460	U	P
Copper		-		-		-		-	1.280	U	P
Iron		-		-		-		-	-3.900	B	P
Lead		-	3.0	U	3.0	U	3.0	U	0.600	U	F
Magnesium		-		-		-		-	200.680	U	P
Manganese		-		-		-		-	0.240	U	P
Mercury		-		-		-		-	0.100	U	CV
Nickel		-		-		-		-	3.360	U	P
Potassium		-		-		-		-	322.080	U	P
Selenium		-	5.0	U	5.0	U		-	1.000	U	F
Silver		-		-		-		-	1.860	U	P
Sodium		-		-		-		-	200.000	U	P
Thallium		-	5.0	U	5.0	U	5.0	U	1.000	U	F
Vanadium		-		-		-		-	4.000	U	P
Zinc		-		-		-		-	2.000	U	P
Cyanide		-		-		-		-		-	

Not Completed
ZN

WESTON®
MANAGERS DESIGNERS/CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

ORGANIC QUALITY ASSURANCE REVIEW
STEARNS & WHELER
CASE: 12475

REVIEW PERFORMED BY
THE ANALYTICS DIVISION
OF
ROY F. WESTON, INC.

PREPARED BY: Kelly Muir Spittler 8-11-92
Kelly Muir Spittler Date
Unit Leader - Data Validation

VERIFIED BY: Kelly Muir Spittler 8-11-92
for Zohreh Hamid, Ph.D. Date
Section Manager - Data Validation

WESTON.
MANAGERS DESIGNERS/CONSULTANTS

STEARNS & WHELER
CASE: 12475
TCL VOLATILE ORGANICS

INTRODUCTION

This quality assurance review is based upon a review of all data generated from one soil samples collected on 05-08-92. The sample was analyzed according to criteria set forth in the NYSDEC ASP 12/91 for TCL Volatile target compounds.

This review has been performed in accordance with the confirmation method. The reported analytical results are presented as a summary of the data in Attachment II. All of the analytical data were examined to determine the usability of the analytical results and also to determine contractual compliance relative to the analytical requirements and deliverables specified in NYSDEC ASP 12/91. The applicable qualifier codes have been placed next to the results in the data summary to indicate the qualitative and/or quantitative reliability. The details of this evaluation review are presented in the narrative section of this report.

All data have been validated with regard to usability according to the quality assurance set forth in NYSDEC ASP 12/91. If you have any questions or comments on this data review, please call Zohreh Hamid or Kelly Spittler at (215) 344-3745

QUALITY ASSURANCE REVIEW

The analysis was performed by NYTEST Environmental, Inc. for a sample received on 05-09-92.

The findings offered in this report are based upon a rigorous review of the following criteria:

* • Holding Time
* • Blank
* • System Monitoring Compound Recoveries
* • Internal Standard
* • GC/MS Tuning
• Calibration
• Matrix Spike/Spike Duplicate and Matrix Spike Blank Analysis
* • Instrument Performance
* • Compound Identification
* • Compound Quantitation
* • Data Completeness

* All criteria were met; therefore, a narrative section is not provided for this classification.

CALIBRATION

Based on the criteria established in table 5 (page E-49) all compounds met the %D and RRF criteria in the continuing calibrations. The %RSD for bromoform (IC 05-01-92) exceeded 20.5%. Since there was only one outlier in this initial calibration and the %RSD was greater than 40%, the sample data is not qualified on the basis of this outlier. (page E-47, 2.4.4)

MATRIX SPIKE/SPIKE DUPLICATE AND MATRIX SPIKE BLANK

A matrix spike/spike duplicate and matrix spike blank analyses were not provided with this batch of samples. These QC analyses were performed in cases 12550 and 12699. The frequency requirements are specified on page E-56, 7.1, this sample data has not been qualified in reference to these missing QC analyses.

INFORMATION REGARDING DATA

The data have been reviewed according to NYSDEC ASP 12/91. All data are validated with regard to usability.

If you have any questions or comments on this data review, please contact Zohreh Hamid or Kelly Spittler at (215) 344-3745.

ATTACHMENTS

1. Attachment I - Glossary of Data Qualifier Codes.
2. Attachment II - Data Summary.

ATTACHMENT I
GLOSSARY OF DATA QUALIFIER CODES

WESTON.

GLOSSARY OF DATA QUALIFIERS

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds):

U = NOT DETECTED SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS. [Substantially is equivalent to a result less than 10 times the blank level for common contaminants (methylene chloride, acetone and 2-butanone in the VOA analyses, and common phthalates in the BNA analyses) or less than 5 times the blank level for other target compounds or tentatively identified compounds.]

R = UNUSABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

N = NEGATED COMPOUND. RESULT IS CONSIDERED AS NOT PRESENT IN THE SAMPLE.(i.e. A sample result was not confirmed in the Pesticide/PCB analysis)

CODES RELATING TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

UJ = THE REPORTED QUANTITATION LIMITS ARE QUALIFIED ESTIMATED.

OTHER CODES

Q = NO ANALYTICAL RESULT.

ATTACHMENT II
DATA SUMMARY

```
                              WESTON ANALYTICS
                             GC/MS DATA SUMMARY
                   VOLATILE HAZARDOUS SUBSTANCE LIST COMPOUNDS
===================================================================================================
Case Number:  12475                    Client:  STEARNS & WHELER                          PAGE: 1
---------------------------------------------------------------------------------------------------
                           Cust ID:  MW12SS5
Sample
Information                 Matrix:     SOIL
                              D.F.:        1
                             Units:    ug/kg
==========================================fl=========fl=========fl=========fl=========fl=========fl
Chloromethane..........................
Bromomethane...........................
Vinyl Chloride.........................
Chloroethane...........................
Methylene Chloride.....................
Acetone................................
Carbon Disulfide.......................
1,1-Dichloroethene.....................
1,1-Dichloroethane.....................
Trans-1,2-Dichloroethene...............
Chloroform.............................
1,2-Dichloroethane.....................
2-Butanone.............................
1,1,1-Trichloroethane..................
Carbon Tetrachloride...................
Bromodichloromethane...................
1,2-Dichloropropane....................
Trans-1,3-Dichloropropene..............
Trichloroethene........................
Dibromochloromethane...................
1,1,2-Trichloroethane..................
Benzene................................
cis-1,3-Dichloropropene................
Bromoform..............................
4-Methyl-2-pentanone...................
2-Hexanone.............................
```

```
================================================================================================
Case Number:  12475                   Client:  STEARNS & WHELER                          PAGE: 1
------------------------------------------------------------------------------------------------
                             Cust ID:  MW12SS5

=========================================fl=========fl=========fl=========fl=========fl=========fl
Tetrachloroethene..................
1,1,2,2-Tetrachloroethane..........
Toluene............................
Chlorobenzene......................
Ethylbenzene.......................
Styrene............................
Total Xylenes......................
```

rec'd 11/12/92
ECM

DATA COMPLIANCE

ROUP #	DATE	CLP YEAR	SAMPLE NO.	MATRIX	COMPLIANCY VOA	COMPLIANCY BNA	COMPLIANCY PEST/PCB	COMPLIANCY METALS	COMPLIANCY CN	TOTAL PHENOLS	PAGE NO. IN THE CLP	NON-COMPLIANCY
12699	8-11-92	3/90	BB-5A	SOIL	1	NA	NA	1	1	NA		
			BB-5B	SOIL	1			1	1			1) ALL ANALYSES COMPLIANT
			BB-6A	SOIL	1			1	1			
			BB-6B	SOIL	1			1	1			
			BB-6C	SOIL	1			1	1			
			DUP	WATER	1							
			ST-1	SOIL	1			1	1			
			SW-1	WATER	1			1	1			
			SW-2	WATER	1			1	1			
			SW-3	WATER	1			1	1			
			SW-4	WATER	1			1	1			
			SW-5	WATER	1			1	1			

NA = NOT ANALYZED

DATA COMPLIANCE

					COMPLIANCY							
ROUP #	**DATE**	**CLP YEAR**	**SAMPLE NO.**	**MATRIX**	**VOA**	**BNA**	**PEST/PCB**	**METALS**	**CN**	**TOTAL PHENOLS**	**PAGE NO. IN THE CLP**	**NON-COMPLIANCY**
12699	8-11-92	3/90	SW-6	WATER	1	NA	NA	1	1	NA		
↓	↓	↓	SW-7	WATER	1	↓	↓	1	1	↓		1) ALL ANALYSES COMPLIANT
			TB	WATER	1			NA	NA			

NA = NOT ANALYZED

APPENDIX F

HABITAT SURVEY

APPENDIX F

HABITAT ASSESSMENT

INTRODUCTION

The purpose of this habitat assessment is to provide a detailed record of the physical makeup, character, and general quality of the existing natural systems on and downstream of the former Accurate Die Casting property to assess what potential receptors may exist. The study area is to the rear of the developed site and along a portion of the stream corridor of Bishop Brook. The portion of the brook considered within the study area extends from Cashin Drive on the east to Route 257 on the west. Site visits were conducted on July 19 and 28, 1992 to perform a reconnaissance of areas on and adjacent to the former Accurate Die Casting property to determine the physical makeup of the existing plant and animal communities.

PROJECT LOCATION AND NEIGHBORHOOD CHARACTERISTICS

The former Accurate Die Casting property is a ±32-acre site fronting on Route 5 (Genesee Street) in the Village of Fayetteville, New York, at a location approximately 1,200 feet east of the intersection of Routes 5 and 257. Reference is made to the site location map (Map L1). The property and its surrounding environs have been significantly modified and impacted by long-term, man-modified land uses and development.

Mixed commercial land uses border either side and are located along portions of the front of the property. These include a day school, lawyer's office, certified public accountants' office, U.S. Post Office, hair dressers' establishment, and a cat hospital. To the east is a Methodist church complex and well-maintained, small lot, residential development fronting along Cashin Drive. To the north is the Bishop Brook corridor, which occupies a well-defined valley that contains a sanitary sewer line. Along the western side of the property is a power line, and further to the west is a now-abandoned former railroad track constructed on an elevated section across the Bishop Brook valley. Further to the west, along the sides of the brook and fronting on Route 257 (Manlius Street) are single-family residences on well-maintained small lots. Reference is made to the key map (L1) and site features map (L2).

PHYSICAL DESCRIPTION OF THE PRIMARY LAND AREAS

A. **Topography.** The developed sections of the former Accurate Die Casting property are situated along higher ground surfaces south of the Bishop Brook valley and at elevations which function with the existing developments fronting Route 5. Site slopes pitch from the front of the property toward the north (rear). The constructed portions of the site and land areas for 100 to 200 feet behind same (north) generally have gradients that range between 1 and 10 percent. Portions of the developed areas contain steep man-made embankments separating the more level sections. What appears to be a former borrow area exists along the southeastern portion of the property.

North of the developed site areas, the land surfaces slope, at first, gently and then steeply toward the valley floor associated with Bishop Brook. Site grades on the steeper slopes exceed 25 percent at a number of locations. The Bishop Brook valley bottom slopes from east to west across the study area, following the gradient of the watercourse. At some locations, the Bishop Brook channel lies at the base of the steep slopes or along the base of a vertical rock outcrop face. At other locations, it is "cut" several feet into the otherwise nearly flat-surfaced plane of the valley bottom. The brook is generally located near the northern edge of the flatter portions of the valley bottom.

Brook overflow channels and the flat depressions indicative of intermittent pooling of runoff waters are evident along portions of the valley bottom. North of Bishop Brook are landscape features that contain small areas of valley bottom topography and the steeper slopes of the adjacent hillside. The valley bottom and the surrounding hillside features flatten and become gentler landforms at locations to the west of the former railroad track.

The former railroad embankment crosses the Bishop Brook valley floor at a near right angle and interrupts the natural topographic character of the Bishop Brook system with its steep man-made slopes.

Reference is made to illustrative site section (L3), which graphically displays the physical character and topographic relationship of the developed site areas and the Bishop Brook valley system.

B. **Floodplain.** A review of the Federal Emergency Management Act floodplain mapping for the Village of Fayetteville, New York, delineated on NYSDEC maps, shows that the area of Bishop Brook between Route 257 and Cashin Drive does not contain a designated 100-year floodplain (A zone). Designated floodplain areas are associated with the old Erie Canal and Limestone Creek, which are located in lower elevation areas of the study area. The site investigations did notice physical evidence of stormwater runoff-related overflows of the banks of Bishop Brook onto the surfaces of the adjacent valley floor. This evidence included intermittent flow channels, intermittent pooling areas, and water-washed riverine vegetation.

C. **Bishop Brook Watercourse.** Bishop Brook crosses the study area in an east to west direction. A portion of the brook traverses the northern section of the former Accurate Die Casting property. Bishop Brook involves a watershed in excess of five square miles upstream from the study area, which contains a variety of existing land uses. The brook is classified as a Class C stream, Standard CTS, and is considered best suitable for primary and secondary recreation and fishing and fish propagation. Under NYSDEC standards, the CTS classification means that Bishop Brook has been designated as a trout stream and spawning occurs within the waterway. Bishop Brook is also deemed a state-protected watercourse. This designation means that any proposal for stream bed and bank alteration requires a SD (stream disturbance) permit. The SD permit requirement limits the type and timing of work within the brook, such as restricting disturbance activities in critical times of the year to enable fish (trout) spawning to occur.

Bishop Brook arises in the higher ground to the east and south of the study area. Flow is toward the west and includes culverts under Route 5 and Cashin Drive. Local stormwater drainage from the Cashin Drive residential neighborhood travels overland along local roadway edges to collection points and is piped into the brook.

Within the study area, Bishop Brook contains either a single channel or is divided into several channels by small islands. The watercourse is generally between 8 and 12 feet across (except in the area of the beaver "pond") and is "cut" from 1 to 3 feet into the surrounding grades.

Recent construction of a gabion revet mattress and riprap stone extending across the face of the steep slope leading down to the Bishop Brook waterway is located in the northeastern section of the former Accurate Die Casting property. This man-made structure controls and directs surface runoff and controls groundwater seepage, preventing a washout from this section of the steep hillside.

West of the property, a large stone-faced culvert with wing walls directs the flow of Bishop Brook through the former railroad embankment. Brook flows through this culvert have been modified in the recent past by beaver activity, which has created a mud and stick "dam" across part of the culvert's inlet opening. The beaver activity has resulted in the creation of a shallow impoundment for several hundred feet upstream of the culvert structure. Shrubs and trees lining the banks of Bishop Brook have been flooded and have drowned, creating conditions displaying a regeneration of wetland-oriented grasses and herbaceous vegetation in the midst of the dead woody plants.

West of the former railroad embankment and culvert, Bishop Brook traverses through wooded hillside areas and the rear yards of the residential community adjacent to Route 257. In several areas, the residential lawns and gardens extend to the brook edge and landscape modifications have been made to physical character of the brook channel.

Bishop Brook flows under Route 257 in a culvert structure and continues downslope to discharge into a branch of the old Erie Canal system and Limestone Creek.

D. **Developed Site Areas.** Currently, the former Accurate Die Casting property is an essentially unmaintained site. The portion of the site fronting Route 5 is periodically mowed. Internal areas of the property between former work areas, driveways, and parking lots have been left to overgrow to weeds and scrub.

Several "walking" trails cross the upper slopes of the hillside above Bishop Brook and extend across the steep slopes onto the Bishop Brook valley bottom at several locations.

E. **Power Line.** The power line corridor contains areas of open grass and wildflower growth and sections with dense woody shrub vegetation. The lack of significant tree species growth in this area bordered by trees indicates that the power corridor most likely is maintained as a scrub shrub habitat.

F. **Site Soils.** A review of the Onondaga County Soil Survey noted that the former Accurate Die Casting property and the Bishop Brook valley contained several soil distinct types. These are:

Soil Series	Description
Benson	Benson series soils consist of shallow, somewhat excessively drained or excessively drained, medium-textured soils on uplands. Benson soils in the study area are BNC, Benson-Wassaic-Rock outcrop association, and occur along the top of the hillsides above the Bishop Brook valley between the former Accurate Die Casting property and the former railroad.
Camillus	Camillus series soils consist of moderately deep, well-drained, medium-textured soils that are 20 to 40 inches deep over soft-gray silty shale bedrock. Camillus soils in the study area are CaB and CBE, Camillus silt loam and Camillus and Lairdsville shaly soils. CaB soils occur in a small area near Route 257, and CBE soils are found along the steep slopes above the Bishop Brook valley bottom between the former Accurate Die Casting property and Cashin Drive.
Cazenovia	Cazenovia series soils consist of deep, well-drained and moderately well drained, medium-textured soils that have a moderately fine-textured subsoil. Cazenovia soils in the study area are CfB and CfC, Cazenovia silt loam, and occur in the upland hillside areas between the former railroad and Route 257.

Soil Series	Description
Fluvaquents	Fluvaquents, FL, are frequently flooded soils, popularly termed alluvial land, and consist of alluvial soils and recent deposits of alluvial soil materials. Most occur on narrow flooded plains and alluvial fans of secondary streams. In the study area, fluvaquents occur along the immediate corridor of Bishop Brook and its associated flat-surfaced floodplain.
Honeoye	Honeoye series soils consist of deep, well-drained, medium-textured soils that formed in calcareous glacial till. Honeoye soils in the study area are HtE and [illegible], Honeoye, Lansing and Ontario soils, and occur along the steep slopes bordering the Bishop Brook valley bottom.
Howard	Howard series soils consists of deep, well-drained and somewhat excessively drained, medium-textured and moderately coarse textured soils that formed in stratified sand and gravel outwash material. Howard soils in the study area are HyA, Howard gravelly silt loam, and occur in the area immediately adjacent to the Bishop Brook culvert under Route 257.
Palmyra	Palmyra series soils consist of deep, well-drained to excessively drained, medium-textured soils that have a high content of gravel. Palmyra soils in the study area are PgB and PHE, Palmyra gravelly loam and Palmyra and Howard soils. Palymra gravelly loam occurs across the majority of the higher elevation upland areas of the former Accurate Die Casting property and areas to the east of the site. Palmyra and Howard soils occur in the steep hillside area above the Bishop Brook valley bottom in the northeast corner of the Accurate Die Casting property. It is in this site area that the gabion revet mattress has been constructed.

The general character of the soils found within the study area have moderate to well-drained drainage features. One small wetland pocket was identified in a portion of Palymra gravelly loam. The remainer of the study area soils displayed physical features quite similar to their mapped descriptions. At several locations along the lower slope areas adjacent to Bishop Brook, ledge rock outcrops were in evidence. The fluvaquents associated with Bishop Brook displayed both sandy rapid draining and silty poorly drained characteristics. Reference is made to the attached site soils map (L4), which illustrates the general location of the different soil types on the property.

BIOLOGICAL RESOURCES - VEGETATION

The property of the former Accurate Die Casting facility and the hillsides and valley bottom bordering Bishop Brook in the northern portion and to the west of the property contain a diversity of vegetation habitats. The field investigations have identified 13 different vegetation associations within the general study area and within the developed sections of the property. Reference is made to the attached site vegetation map (L5) for the location of the various growth habitat areas. Identified vegetation associations include:

Area 1	Grass and Scrub Shrub Growth in Development Areas
Area 2	Overgrown Gravelly Disturbed Zone Near Pavements
Area 3	Scrub Shrub and Young Tree Upland Growth Zone
Area 4	Upper Slope Scrub Shrub Wetland
Area 5	Deeply Eroded Watercourse Through Wooded Area
Area 6	Scrub Shrub and Young Tree Growth long Power Line
Area 7	Black Oak Grove along Top of Steep Slope
Area 8	Bishop Brook Valley Bottom and Floodplain
Area 9A	Bishop Brook Valley Bottom Riverine Corridor
Area 9B	Bishop Brook Steeply Sloped Riverine Corridor
Area 10	Upland Meadow, Scrub Shrub and Young Tree Growth
Area 11	Beaver Pond and Reed Canary Grass Wet Meadow
Area 12	Steeply Sloped Deciduous and Evergreen Woods
Area 13	Residential Neighborhood Landscape Systems

A. **Grass and Scrub Shrub Growth in Developed Areas.** This vegetation association has regenerated as a result of the low landscape maintenance efforts in evidence within the developed sections of the property. Lawn grasses have gone to seed, field grasses have started growth, a number of field flowers are thriving, and tree sapling and woody shrub growth has commenced on non-paved site surfaces. The plant species are identified as those which form common pioneer vegetation on disturbed sites. Plant species identified include:

TREES

<u>Common Name</u>

Black Locust
Wild Pear
Cottonwood
Gray Birch
Birch spp.
White Ash
Chinese Elm
American Elm
White Mulberry

SHRUBS AND VINES

<u>Common Name</u>

Fox Grape
Staghorn Sumac
Shrub Honeysuckle
Red Raspberry
Tatarian Honeysuckle
Red Stemmed Dogwood

GRASSES, FLOWERS, ETC.

<u>Common Name</u>

Japanese Knapweed
Chicory
White Sweet Clover
Hawkweed
Common Milkweed
Evening Primrose
Campion
Wild Madder
Goldenrod
St. Johnswort
Butterfly Weed
Daisy Fleabane
Rough Cinquefoil
Rough Fruited Cinquefoil
Queen Anne's Lace
Morning Glory
Viper's Bugloss

B. **Overgrown Gravelly Disturbed Zone Near Pavements.** This vegetation association occurs within site areas that are to the north, east, and west of the parking pavements located along the northern side of the main building. Field flowers, field grasses, woody shrubs, and tree saplings have commenced growth within the disturbed and gravelly soils of the association. Plant species are identified as those which form common pioneer vegetation on disturbed sites. Plant species identified include:

TREES

Common Name

- Black Locust
- Norway Maple
- White Ash
- American Elm
- Scots Pine

SHRUBS AND VINES

Common Name

- Staghorn Sumac
- Gray Stemmed Dogwood
- European Buckthorn
- Red Raspberry
- Fox Grape
- Poison Ivy

GRASSES, FLOWERS, ETC.

Common Name

- Milkweed
- Daisy Fleabane
- White Sweet Clover
- Wild Madder
- Butterfly Weed
- Crownvetch
- St. Johnswort
- Black Eyed Susan
- Heal All
- Common Milkweed
- Brome Grass
- Timothy
- Campion
- Knapweed
- Blue Eyed Grass
- RoughFruited Cinquefoil

C. **Scrub Shrub and Young Tree Upland Growth Zone.** This vegetation association occurs within site locations that may have been modified at some time in the past but have lain fallow for some extended period of time. Areas of dense shrub and young tree growth are interspersed with open sections growing to field flowers and grasses. Plant species are identified as those which commonly colonize former disturbed sites and sites that fringe along developments. Plant species type and diversity are considered good. Plant species identified include:

TREES

Common Name

- Quaking Aspen
- Black Locust
- American Elm
- American Sycamore
- Willow spp.

SHRUBS AND VINES

Common Name

- Staghorn Sumac
- Red Raspberry
- Tartarian Honeysuckle
- Fox Grape
- Red Stemmed Dogwood

GRASSES, FLOWERS, ETC.

Common Name

- Ox-Eye Daisy
- Black Eyed Susan
- Goldenrod
- Wild Madder
- Heal All
- Rough Fruited Cinquefoil
- Yarrow
- Blue Eyed Grass
- Knapweed
- Common Plantain
- Pale Plantain
- English Plaintain
- Timothy
- Purple Flowering Raspberry

D. **Upper Slope Scrub Shrub Wetland.** This vegetation association occurs within the scrub shrub and young tree upland growth zone, but displays physical evidence indicative of a wetland. The area may have been formed by former excavation and leveling activities that flattened and pocketed the original topography. Upland plant species continue within the area, but wetland-oriented plant materials become dominant, especially within a number of water pockets that are located in small ruts and hollows. The site area exhibits moderately low quality wetland features and values. Plant species identified include:

GRASSES, FLOWERS, ETC.

Common Name

Black Eyed Susan
Purple Loosestrife
Wild Madder
Daisy Fleabane
Boneset
False Nettl
Bull Thistle
Soft Rush
Bulrush
Rushes
Path Rush
Toad Rush
Sedges
Beak Rush

SHRUBS AND VINES

Common Name

Blackberry
Multiflora Rose

TREES

Common Name

Quaking Aspen
White Willow

FERNS

Common Name

Sensitive Fern

E. **Deeply Eroded Watercourse Through Wooded Area.** This site landform condition exists within a small section of study area at the interface of the black oak grove along top of steep slope and the upper slope scrub shrub wetland vegetation association located behind the developed areas of the former Accurate Die Casting property. The area is considered separately not for its different plant growth, but for its unstable landform characteristics which are impacting plant growth within both of the adjacent vegetation associations. Storm runoff water appears to be concentrated at this location from overland flows discharging from the adjacent power line area and the upper slope scrub shrub wetland. The runoff waters have eroded a deep gully across the side of the steeply sloped hillside. This gully has a top width that varies from 6 to 20 feet and a depth that ranges from 5 to 15 feet. Side slopes are of exposed soils and are near vertical. The eroding gully condition is degrading the surrounding plant growth and the runoff waters are transporting sediments onto the Bishop Brook valley bottom. This noted association is degrading an otherwise stable area of the study area. Plant species identified growing along the edges of the gully include:

TREES

Common Name

Silver Maple
Black Cherry
Butternut
Wild Apple
Box Elder

SHRUBS AND VINES

Common Name

Virginia Creeper
Fox Grape
Multiflora Rose
Grey Stemmed Dogwood
Purple Flowering Raspberry

F. **Scrub Shrub and Young Tree Growth Along Power Line.** This vegetation association is a man-modified and man-controlled ecosystem that is regularly manipulated to control tree growth from impacting the overhead power lines. Plant materials are maintained as open field and shrub growth. Plant species identified growing within the power line corridor and along the fringes include:

SHRUBS AND VINES

Common Name

Red Raspberry
Staghorn Sumac
Tartarian Honeysuckle
Multiflora Rose
Sedges
Path Rush
Purple Flowering Raspberry

GRASSES, FLOWERS, ETC.

Common Name

Goldenrod
Black Eyed Susan
Rough Fruited Cinquefoil
Ox-Eye Daisy
Evening Primrose
Red Clover
White Sweet Clover
Daisy Fleabane

FERNS

Common Name

New York State Fern
Lady Fern

TREES

Common Name

Catalpa
White Ash

G. **Black Oak Grove along Top of Steep Slope.** This vegetation association consists of a stand of mature trees, primarily black oak, growing along the top of the steep slope bordering the Bishop Brook valley bottom. The tree growth and spacing forms a dense, full canopy that shades the forest floor. Understory growth is present, but except along the woodland fringes where it receives sufficient sunlight, is rather thin and sparse. Plant species identified include:

TREES	SHRUBS AND VINES	GRASSES, FLOWERS, ETC.
Common Name	Common Name	Common Name
Black Oak	Grey Stemmed Dogwood	Goldenrod
White Ash	Multiflora Rose	Burdock
Pignut Hickory	Bramble	Heal All
American Beech	Tartarian Honeysuckle	Wild Geranium
Shagbark Hickory	European Buckthorn	False Solmon's Seal
Black Cherry	Witch Hazel	
Ironwood	Virginia Creeper	
Hophornbeam	Highbush Cranberry	
Red Oak		
Sugar Maple		
American Basswood		
Chestnut Oak		

H. **Bishop Brook Valley Bottom and Floodplain.** This vegetation association occurs along the base of the wooded steeply sloped hillside separating the Bishop Brook corridor from the higher elevation areas associated with developed areas on the former Accurate Die Casting property. The waterway of Bishop Brook and its riverine growth are located along the northern side of this association. The vegetation association consists of areas of field grass growth, scrub shrub growth, and wetland-oriented plant materials growing in floodplain pockets and brook overflow channels. Site soils are quite gravelly and sandy, except in the wetter pockets. Plant material diversity is good and their growth patterns are excellent. Plant species identified include:

TREES

Common Name

Black Willow
Northern White Cedar
Black Locust
American Sycamore
Silver Maple
Crack Willow

SHRUBS AND VINES

Common Name

Multiflora Rose
Grey Stemmed Dogwood
Red Stemmed Dogwood
Wild Grape
Smooth Sumac
White Mulberry

GRASSES, FLOWERS, ETC.

Common Name

Field Horsetail
Birds Foot Trefoil
Goldenrod
Daisy Fleabane
Heal All
Red Clover
Black Eyed Susan
Knapweed
Ox-Eye Daisy
Wild Madder
Plain Plantain
English Plantain
Thimbleweed
Buttercup
Jewelweed
Boneset
Joe Pye Weed
Dogbane
Colt's Foot
Broad Leaf Cattail
Phragmites
Orchard Grass
Timothy

I. **Bishop Brook Valley Bottom Riverine Corridor.** This vegetation association contains the scrub shrub and tree growth that thrives along the channel fringes of Bishop Brook. In most locations, the plant material forms a dense, multi-layered thicket bordering and overhanging the waterway. In some locations, broken tree branches and uprooted plant materials have fallen into the brook channel and have restricted and altered flow characteristics. Eddies, pools, and riffle effects have been created by the fallen vegetation. The association forms a valuable contrast to that of the adjacent Bishop Brook valley bottom and floodplain growth. Plant species identified include:

GRASSES, FLOWERS, ETC.

Common Name

Garlic Mustard
Goldenrod
Clotbur
False Nettle
Thistle
Colt's Foot
Violets

FERNS

Common Name

Ostrich Fern

SHRUBS AND VINES

Common Name

Ninebark
Staghorn Sumac
Amelanchier
Ironwood
Shrub Willow

TREES

Common Name

Weeping Willow
White Willow
American Basswood
Sugar Maple
Black Locust
Hemlock
Sycamore
Silver Maple

J. **Bishop Brook Steeply Sloped Riverine Corridor.** This vegetation association occurs where steeply sloped wooded conditions extend to the edge of Bishop Brook. The tree growth is primarily deciduous and generally mature, though several areas of sapling sugar maple growth occurs, particularly along the top of the slopes. The trees form a dense fully developed canopy which shades the ground surfaces. Understory growth is present, but except in locations where there is sufficient sunlight, is rather thin and sparse. Plant species identified include:

TREES

Common Name

Ironwood
Tulip Tree
White Ash
Red Cedar
Sugar Maple
Chestnut Oak
Pignut Hickory
Shagbark Hickory
White Oak
Cottonwood
Black Cherry
Yellow Birch
Hophornbeam
Hawthorn
Red Cedar

GRASSES, FLOWERS, ETC.

Common Name

Goldenrod
Bloodroot
Canada Anemone
Purple Rose Raspberry

SHRUBS AND VINES

Common Name

Japanese Barberry
Poison Ivy
Tartarian Honeysuckle
Alternate Leaf Dogwood
Virginia Creeper
Witch Hazel
Riverbank Grape
Spicebush
Shrub Honeysuckle
Common Barberry

K. **Upland Meadow, Scrub Shrub, and Young Tree Growth.** This vegetation association occurs in the northeastern section of the former Accurate Die Casting property at a location south of the wooded hillside bordering Bishop Brook and extending into developed site areas. The association exists within site locations that may have been modified at some time in the past but have lain fallow for some period of time. Areas of dense shrub and young tree growth are interspersed with open sections growing to field flowers and grasses. Plant species are diverse and have excellent growth patterns. They are identified as those which commonly colonize former disturbed sites, sites that fringe along developments, as well as those found in sites that exist as cleared open areas. Plant species identified include:

GRASSES, FLOWERS, ETC.

Common Name

White Sweet Clover
Black Eyed Susan
Wild Madder
Butterfly Weed
Vipers Bugloss
Knapweed
Common Parsnip
Ox-Eye Daisy
Blue Eyed Grass
Goldenrod
Rough Footed Cinquefoil
Heal All
Yellow Sweet Clover
Daisy Fleabane

SHRUBS AND VINES

Common Name

Multiflora Rose
Staghorn Sumac
Grey Stemmed Dogwood
Red Raspberry

TREES

Common Name

Scots Pine
Sugar Maple
White Ash
Black Locust
Pignut Hickory
Wild Apple
White Pine

L. **Beaver Pond and Reed Canary Grass Wet Meadow.** This vegetation association is located in the study area for a distance of several hundred feet upstream (east) of the culvert through the former railroad embankment. Recent beaver activity, not necessarily active at this time, is associated with the felling of shrubs and trees along the Bishop Brook valley bottom riverine corridor and the building of a mud and vegetation debris dam across the culvert inlet. This has resulted in the creation of a shallow beaver "pond" immediately upstream of the culvert and an area of reed canary grass shallow water, wet meadow for an additional several hundred feet upstream. Altered waterway flow conditions and the remaining physical "structure" of the numerous beaver "cut' trees have diverted the flow of Bishop Brook into several channels through a dense growth that is dominated by the reed canary grass. Water elevations have been altered and the banks of the brook have been flooded for a period of time that has been sufficient to kill the riverine vegetation. The remains of a number of dead shrubs are being overgrown by the grass. Plant species identified in this quite monocultural vegetation association include:

GRASSES, FLOWERS, ETC.

Common Name

Reed Canary Grass
Joe Pye Weed
Jewelweed

SHRUBS AND VINES

Common Name

Wild Grape

M. **Steeply Sloped Deciduous and Evergreen Woods.** This vegetation association exists in that portion of the study area at a location to the east and west of the former railroad embankment. Site slopes are very steep and approach 1 foot vertical to 1 foot horizontal in some areas. The steep slopes extend to the edge of the beaver-impacted section of Bishop Brook on the east side of the former railroad and to the brook corridor on the west side. Tree species are mature and form a mixed deciduous and evergreen forest. The woods has areas of hemlock growth. The trees form a dense, fully developed canopy which shades the ground surfaces. Understory growth is present, but except in locations where there is sufficient sunlight, is thin and sparse. Where the woods exist near residential development, the forest floor has often become a disposal place for miscellaneous debris and garden-generated organic trash. Plant species identified include:

GRASSES, FLOWERS, ETC.

Common Name

False Solomon's Seal
Myrtle
Black Eyed Susan
White Sweet Clover
Butterfly Weed
Thimble Weed
Heal All
Red Clover
St. Johnswort
Rough Fruited Cinquefoil
Ox-Eye Daisy
Wild Madder
Musk Mallow

GRASSES

Common Name

Timothy
Orchard Grass

SHRUBS AND VINES

Common Name

Witch Hazel
Maple Leaf Viburnum
Japanese Honeysuckle
Virginia Creeper
Alternate-leaved Dogwood
Grey Stemmed Dogwood
Hawthorn
Japanese Barberry
Shrub Honeysuckle
Tatarian Honeysuckle
Fox Grape

TREES

Common Name

Hophornbeam
Black Cherry
Hemlock
Sugar Maple
Black Oak
Red Oak
Ironwood
White Pine
American Basswood
American Elm
Northern White Cedar
Wild Apple
White Ash
ScotsPine
Austrian Pine

N. **Residential Neighborhood Landscape Systems.** This vegetation association extends from the terminus of the relatively undisturbed deciduous and evergreen woods association to Route 257. The association is primarily a man-modified environment with a few remaining sections with natural conditions. Trees remain along the Bishop Brook corridor, but the understory growth has been cleared for landscape plantings and lawns. At locations, the edges of the brook have been shaped and stabilized as part of a landscape effect. This has resulted in an alteration of the natural growth patterns that might have once been natural riverine vegetation. The plant species mixes and combinations are of natural and planted materials, and the association is maintained in a generally stable suburban landscape character. Plant species identified include:

GRASSES, FLOWERS, ETC.

Common Name

Wild Madder
Goldenrod
Herb Robert
Chickory
Deadly Nightshade
Colt's Foot
Pachysandra
Day Lilies (planted)
Pale Touch Me Nots

SHRUBS AND VINES

Common Name

Multiflora Rose
Staghorn Sumac
Japanese Barberry
Ninebark
Maple Leaf Viburnum
Japanese Honeysuckle
Alternate-leaved Dogwood
Flowering Dogwood (planted)
Gray Dogwood
Snowberry (planted)
Red Raspberry
Purple Flowering Raspberry

TREES

Common Name

Sugar Maple
Norway Maple
Box Elder
White Ash
Hemlock (planted)
Scots Pine (planted)

BIOLOGICAL RESOURCES - ANIMAL LIFE

The Bishop Brook valley corridor and the northern areas of the former Accurate Die Casting property with long-term natural open field growth, scrub shrub thickets, wooded ridges and slopes, open floodplain habitat, riverine woods, and the beaver-created pond and wet meadow areas, as well as the more recently abandoned and now overgrowing developed areas of the property, contain conditions suitable to support a diverse mix of animal life. The animal species anticipated to use these various ecosystems area that are tolerant of man's activities and are commonly found within our suburban environment. Therefore, the study site cannot be considered a wild and pristine environment due to its location adjacent to a heavily traveled local commercial route and the extensive areas of bordering village residential developments.

In particular, the Bishop Brook valley bottom with its tree and thicket-lined watercourse, adjacent areas of open field and scrub growth, and surrounding steep-sloped wooded hillsides, contains the privacy and seclusion needed to support a number of wildlife species. The value of the brook corridor is further enhanced for wildlife values by the deciduous woods, open fields, scrub shrub associations, and tree thicket growth bordering the wooded hillsides along the top of the slopes and occurring on areas of the former Accurate Die Casting property to the rear (north) of the developed areas. The scrub shrub and open field growth occurring along the corridor of the power line also serves to enhance values for a number of wildlife species.

While the residential land uses in the western portion of the study area impact upon wildlife values, these homes and gardens are not considered to represent a significant impact to the overall quality of the wildlife values within the Bishop Brook corridor.

Animal species observed during the site visits and or anticipated to be present within the vegetation habitats in the study area include:

1. Songbird species and general area birds, such as cardinal, chickadee, native sparrow, english sparrow, cowbird, goldfinch, robin, blue jay, crow, mourning dove, swallow flycatcher, red wing blackbird, blackbird, starling, red-tailed hawk, and turkey vulture.

2. Migratory birds in season, such as warblers, finches, and vireas.

3. Water-oriented birds, such as mallard ducks, canadian geese, and killdeer.

4. Mammals, such as striped skunk, cottontail rabbit, whitetail deer, raccoon, opossum, beaver grey squirrel, mice, house mouse, vole, and norway rat.

5. Amphibians and reptiles, such as red-striped salamander, bullfrog, box turtle, garden snake, and milk snake.

6. Fish species, such as minnows, forage fish, and trout (based upon NYSDEC stream classification).

7. Insects, such as butterflies, moths, honey bees, mosquitos, dragonflies, deer fly and housefly, water striders, and spiders of varying species.

In addition to wildlife species, the study site is within the roaming territory of domestic dogs and cats from the adjacent residential neighborhoods. The presence of these man-oriented predatory animals impacts and somewhat reduces the overall wildlife value of the study area.

WETLAND SYSTEMS

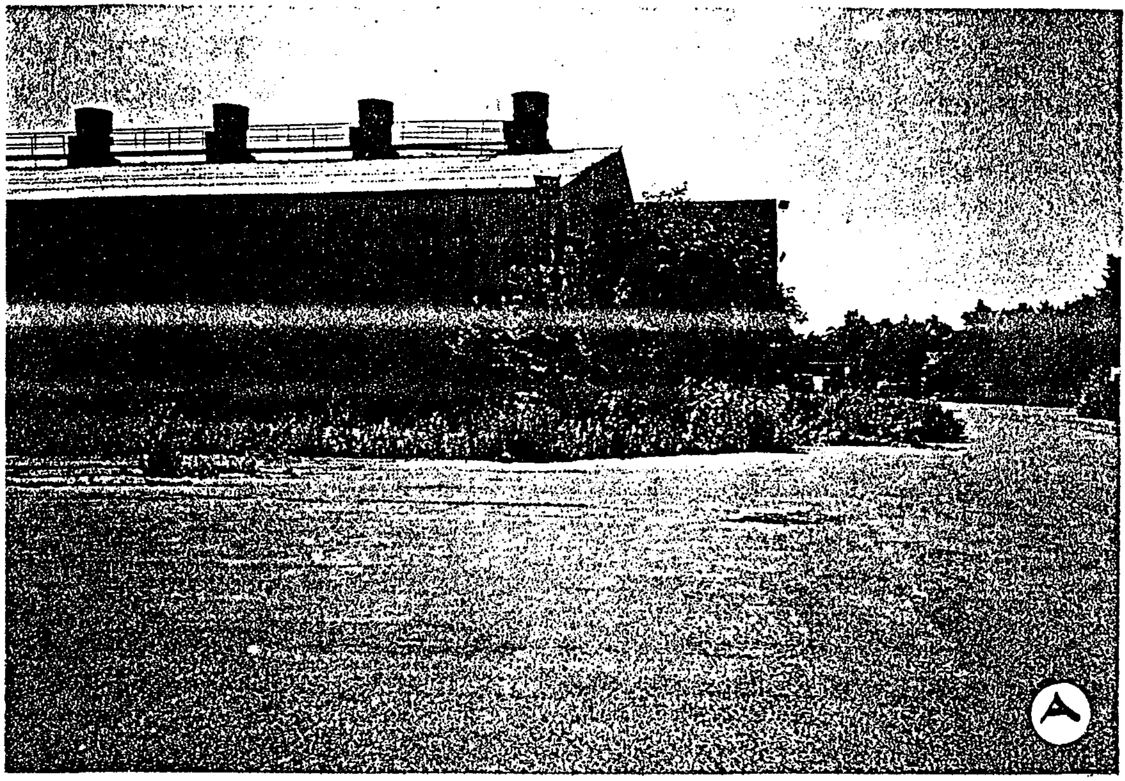
The New York State Department of Environmental Conservation (NYSDEC) does not list state-designated wetland systems associated with either the former Accurate Die Casting property or the Bishop Brook corridor between Cashin Drive and Route 257. The site visits did not identify areas deemed suitable to be called NYSDEC wetlands. However, the site investigations noted field conditions indicative of the potential for federal (ACOE) wetland systems at several locations.

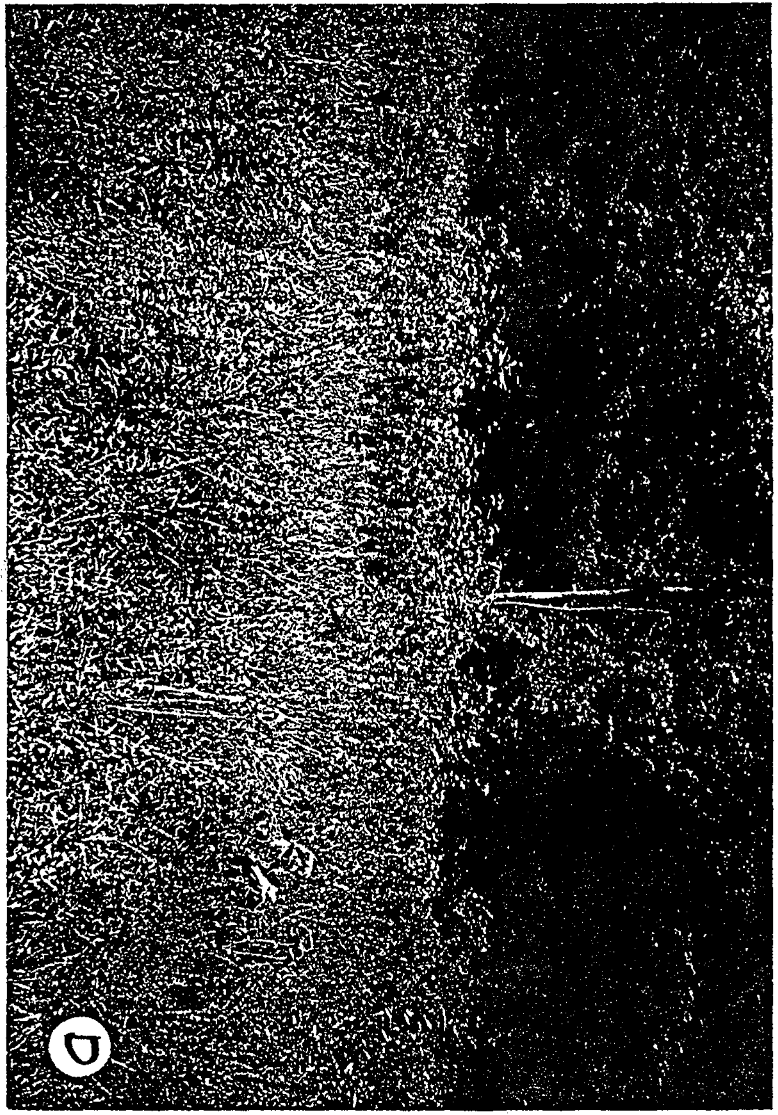
ACOE wetland indicators were identified along sections of the flat valley bottom associated with Bishop Brook. These occurred in areas that were subject to the periodic overflow and intermittent pooling of stormwater runoff carried by the brook. The site areas contained hydric soils, wetland-oriented vegetation, and wetland hydrology features to the level to be deemed a federal wetland. In addition, the noted beaver activity associated with the blockage of flow through the former railroad culvert, has created physical characteristics along the valley bottom floodplain that merit a wetland delineation under federal standards.

Physical conditions displaying hydric soil, wetland-oriented vegetation, and wetland hydrology to a level to be deemed ACOE wetlands were identified within a flat area on the top of the steep slopes above the Bishop Brook valley. This area appears to have been man-modified at some time in the fairly recent past and may have even been excavated to its present elevations. However, wetland-oriented features have developed and now merit a federal wetland delineation for this portion of the property.

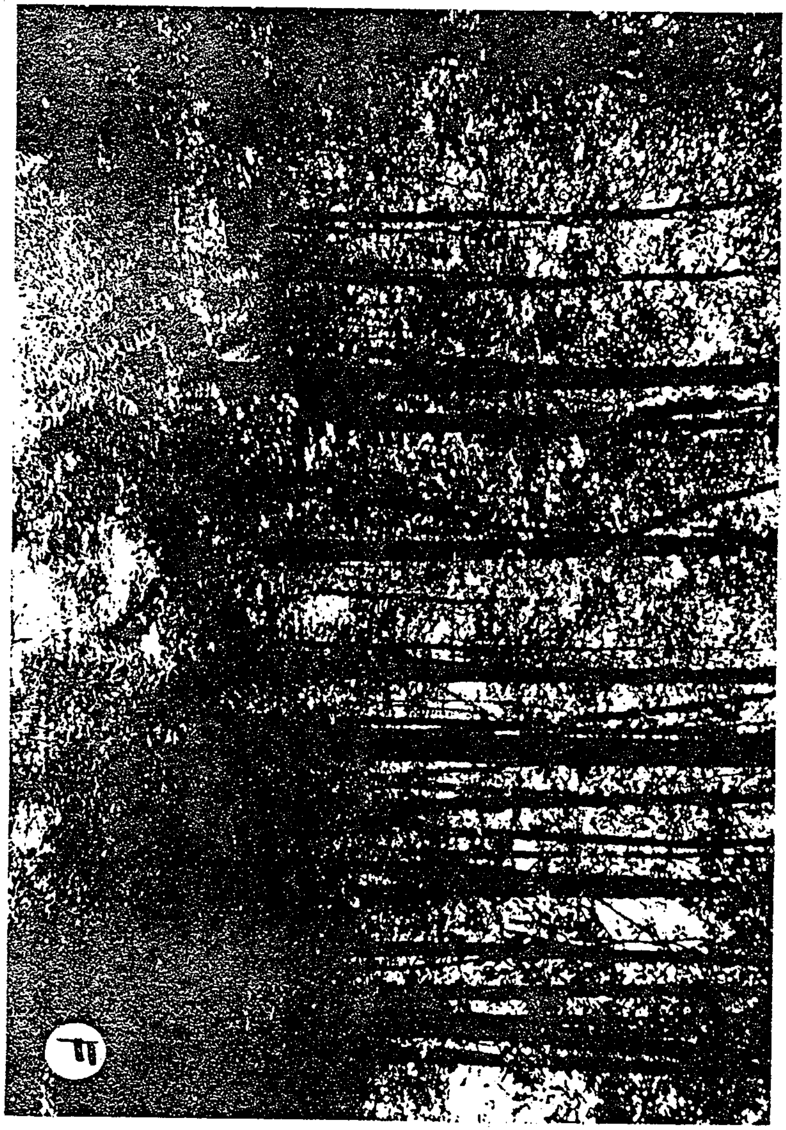
Reference is made to the wetland map (L6) for the illustrative location of the identified wetland systems.

SITE PHOTOGRAPHS





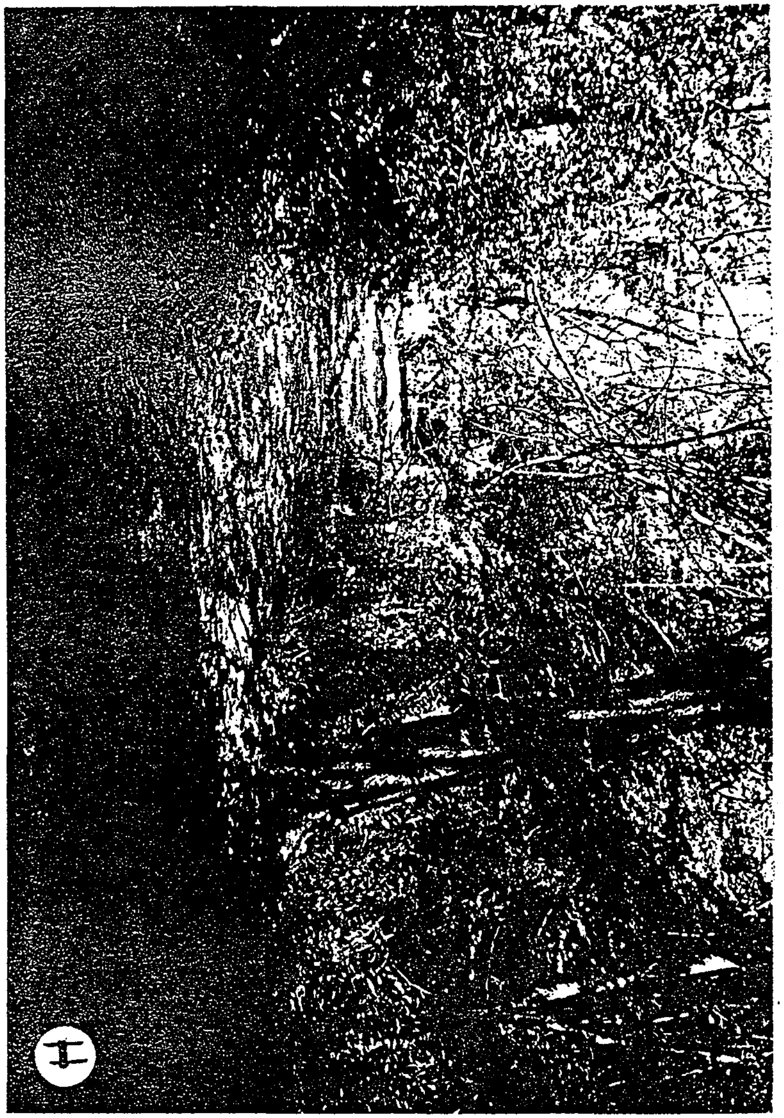
SITE PHOTOGRAPHS

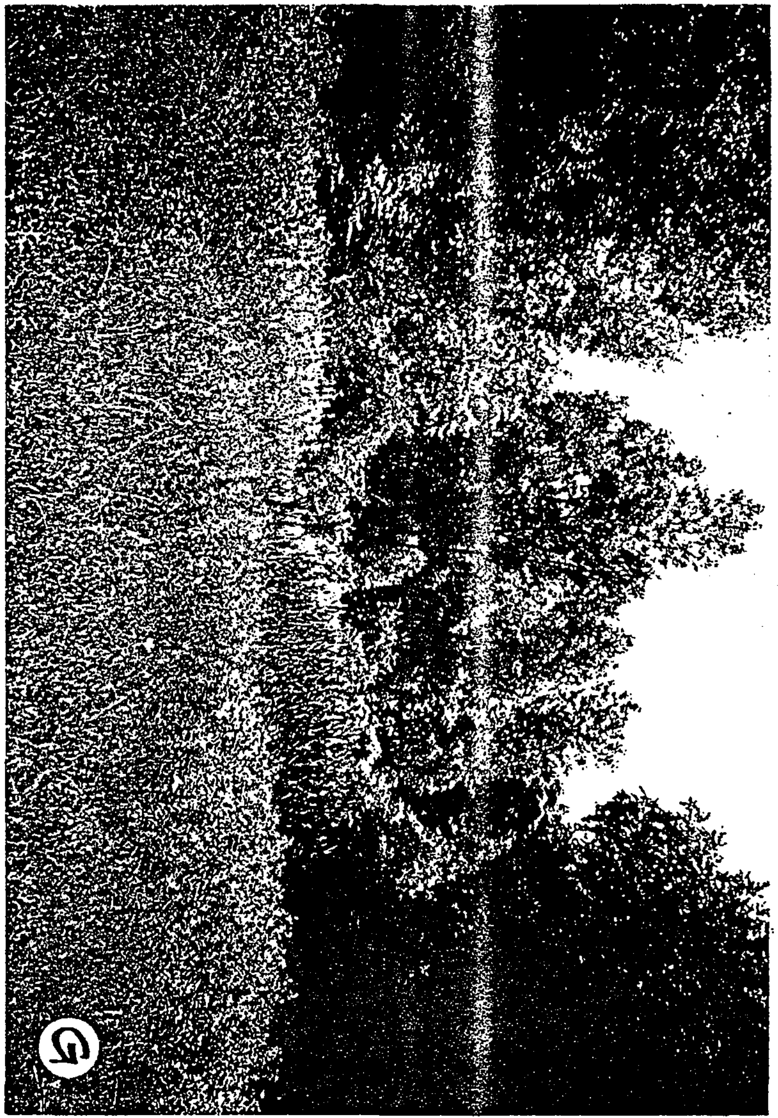


F

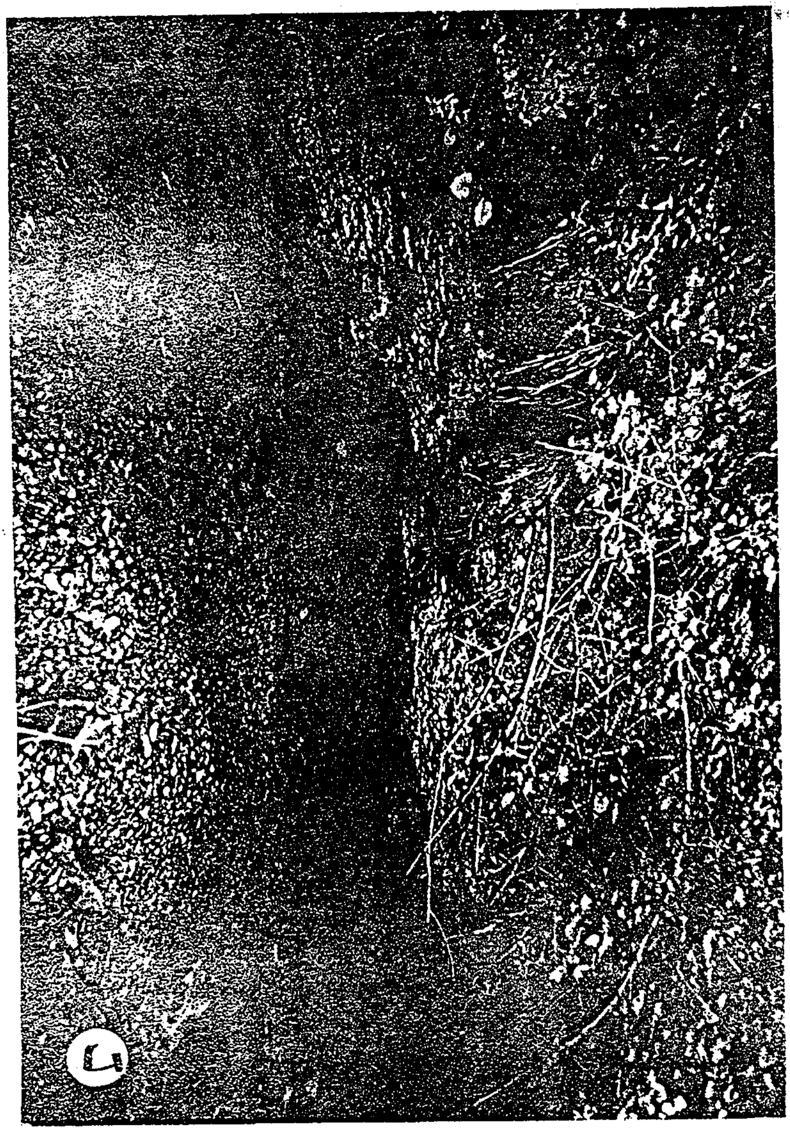
E

SITE PHOTOGRAPHS

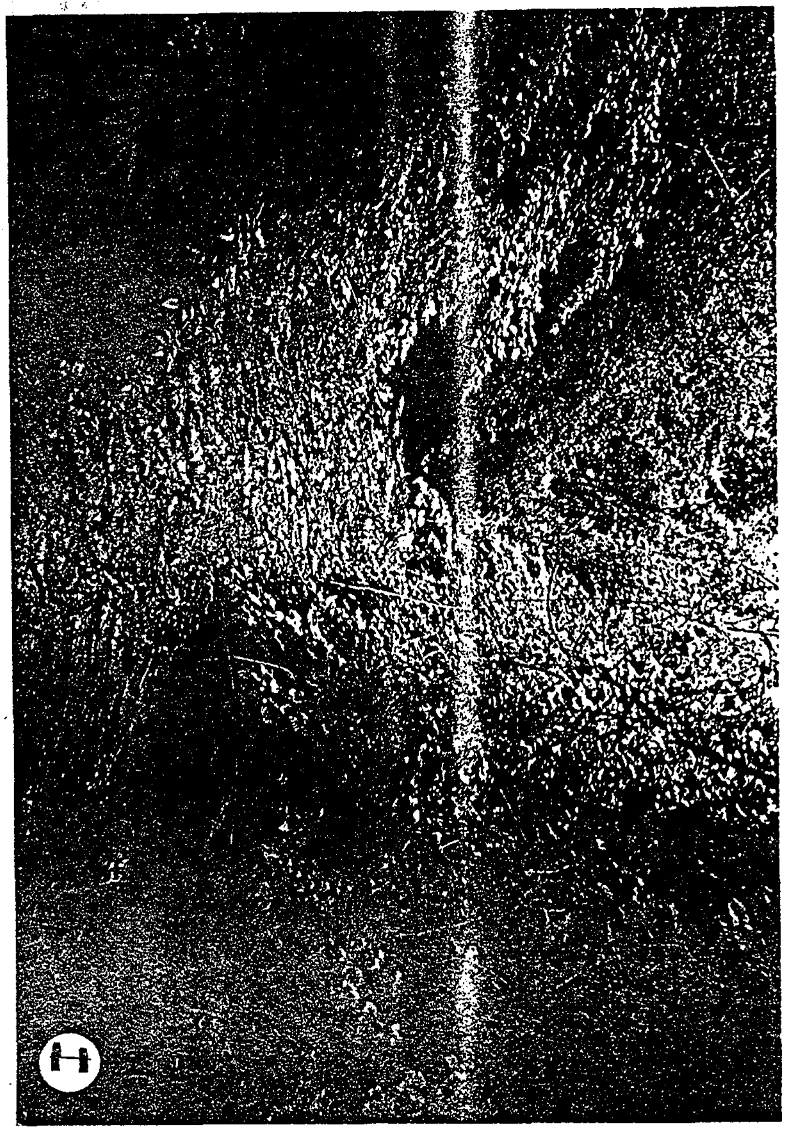




SITE PHOTOGRAPHS

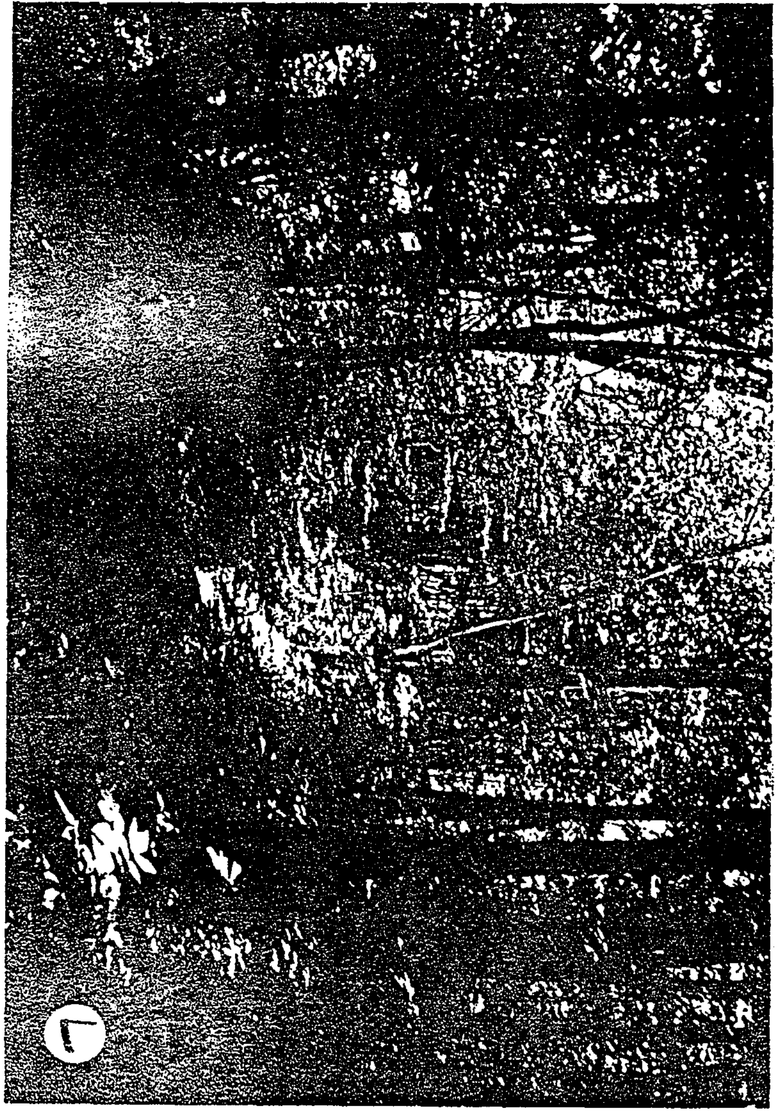


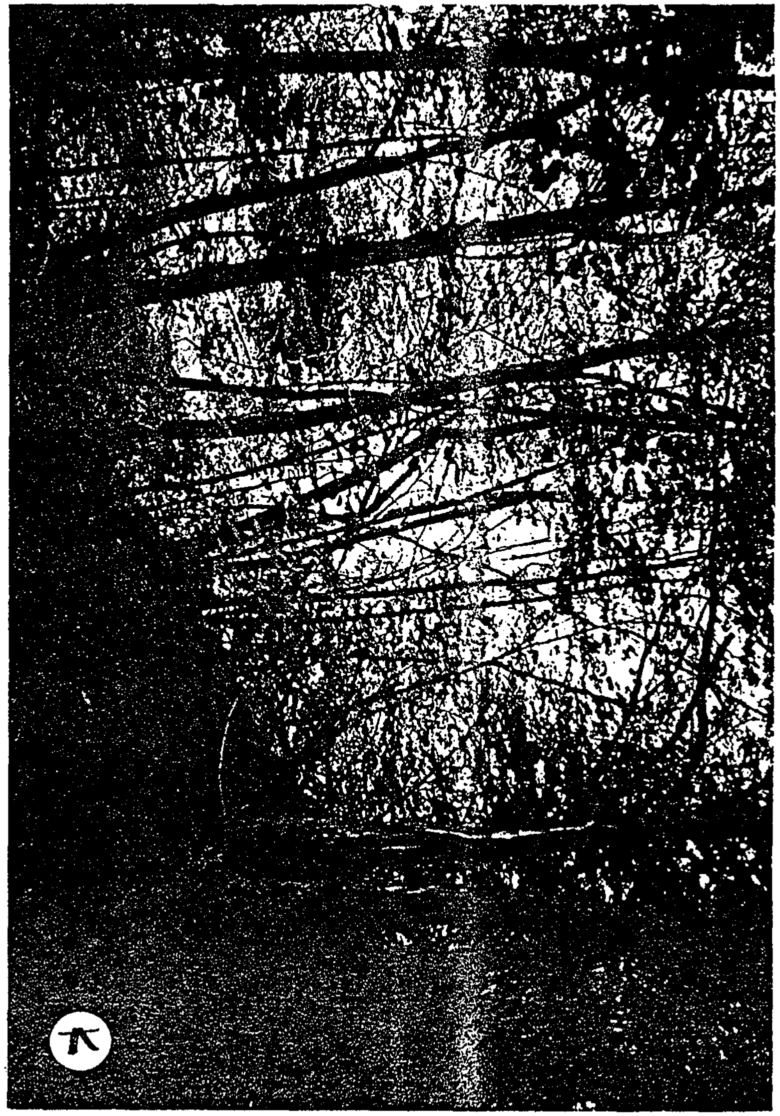
G



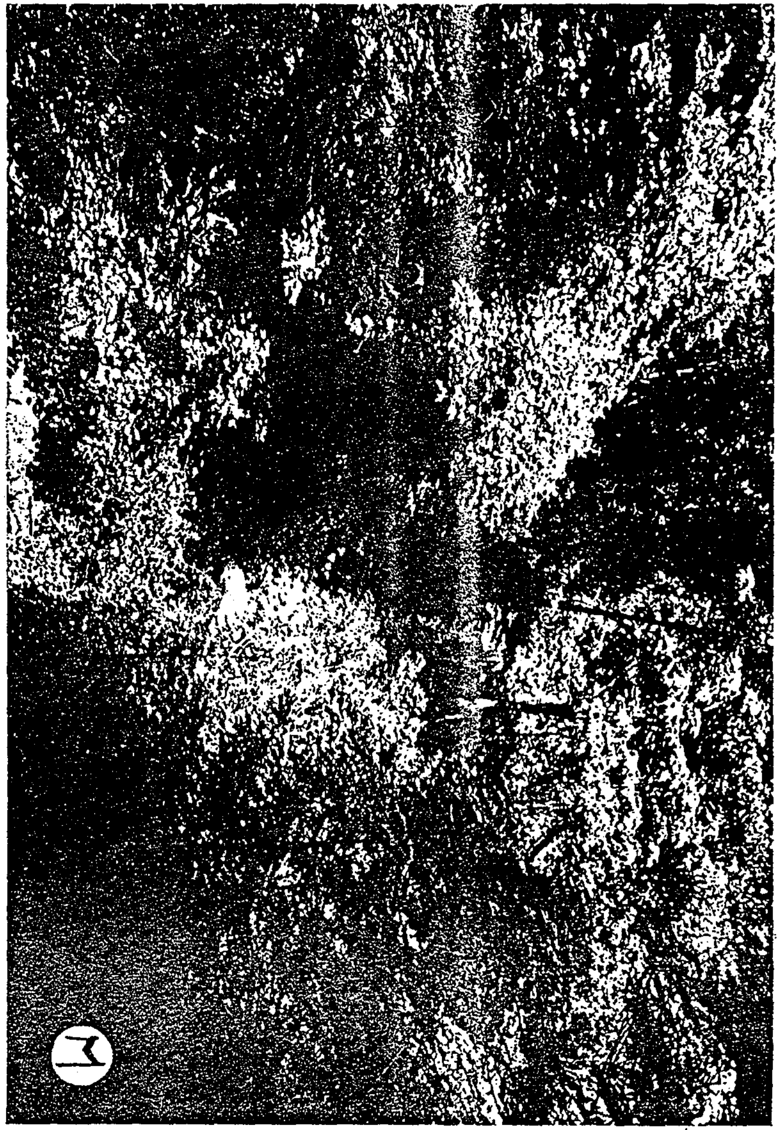
H

SITE PHOTOGRAPHS



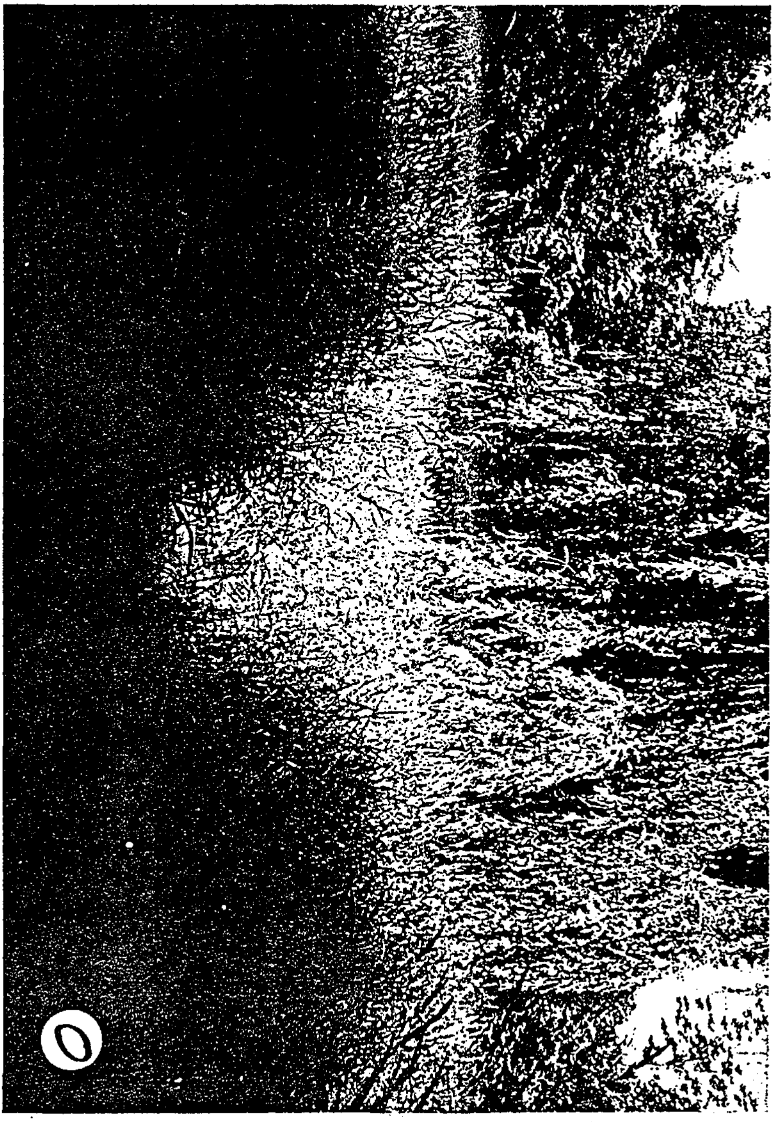


SITE PHOTOGRAPHS



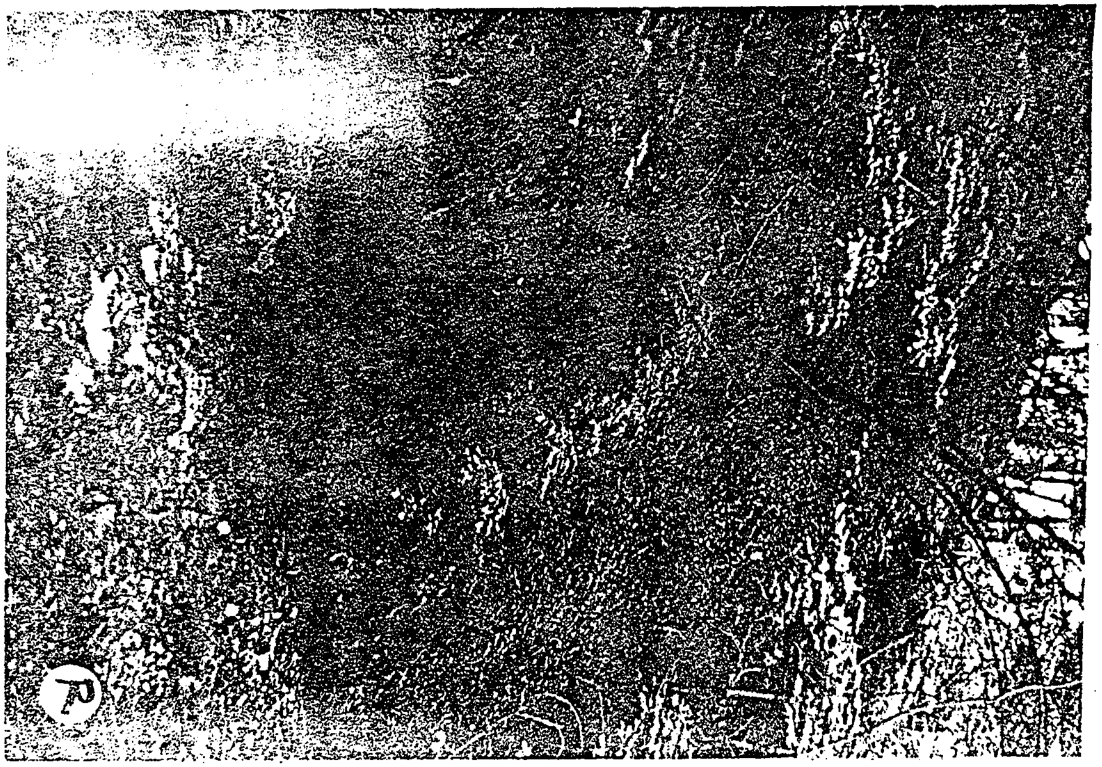
SITE PHOTOGRAPHS

P

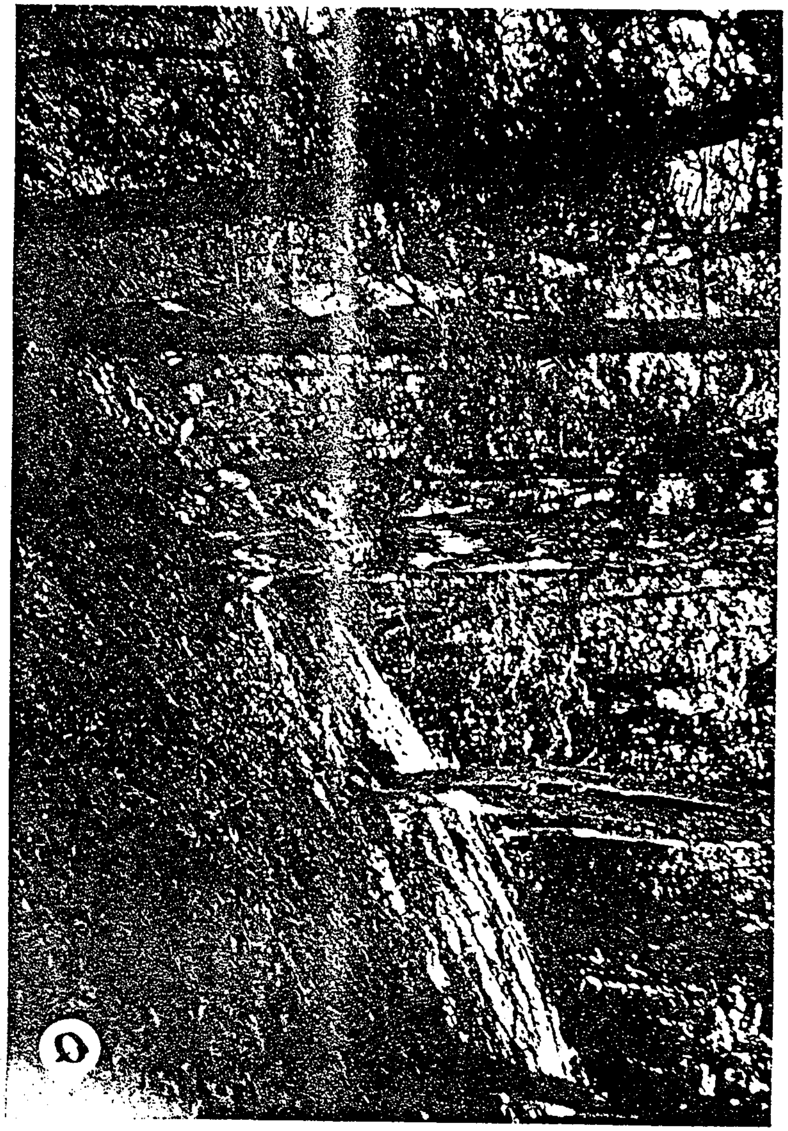


O

SITE PHOTOGRAPHS



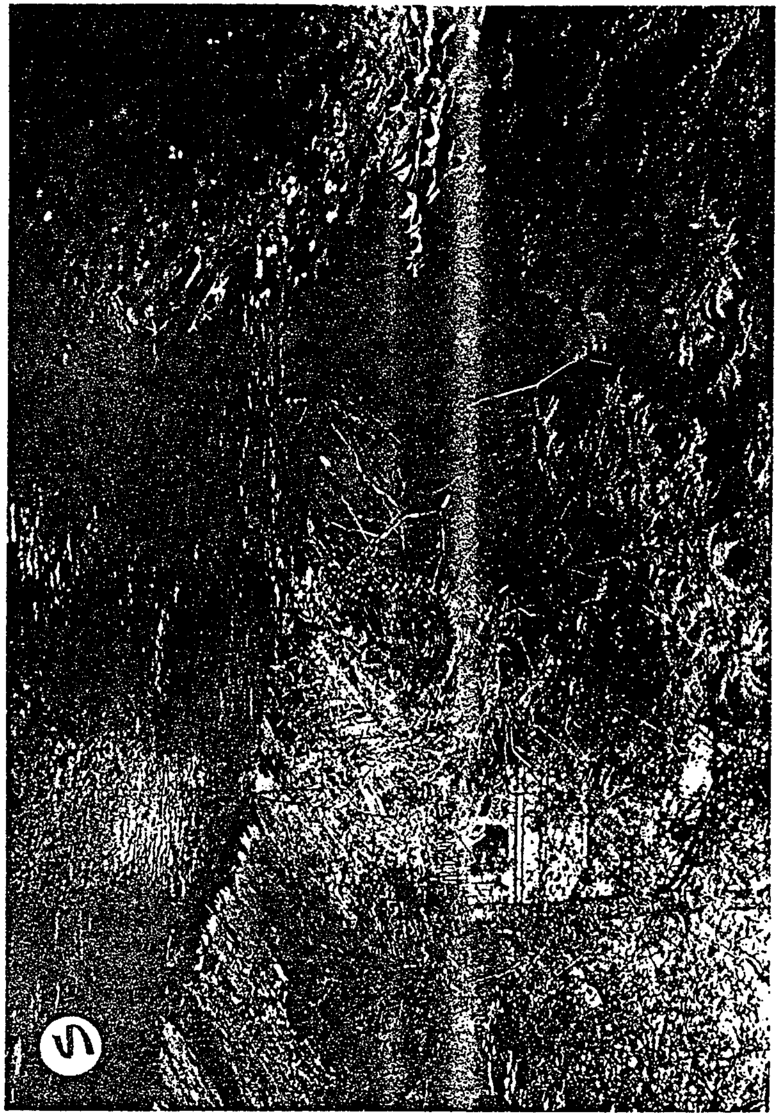
R



Q

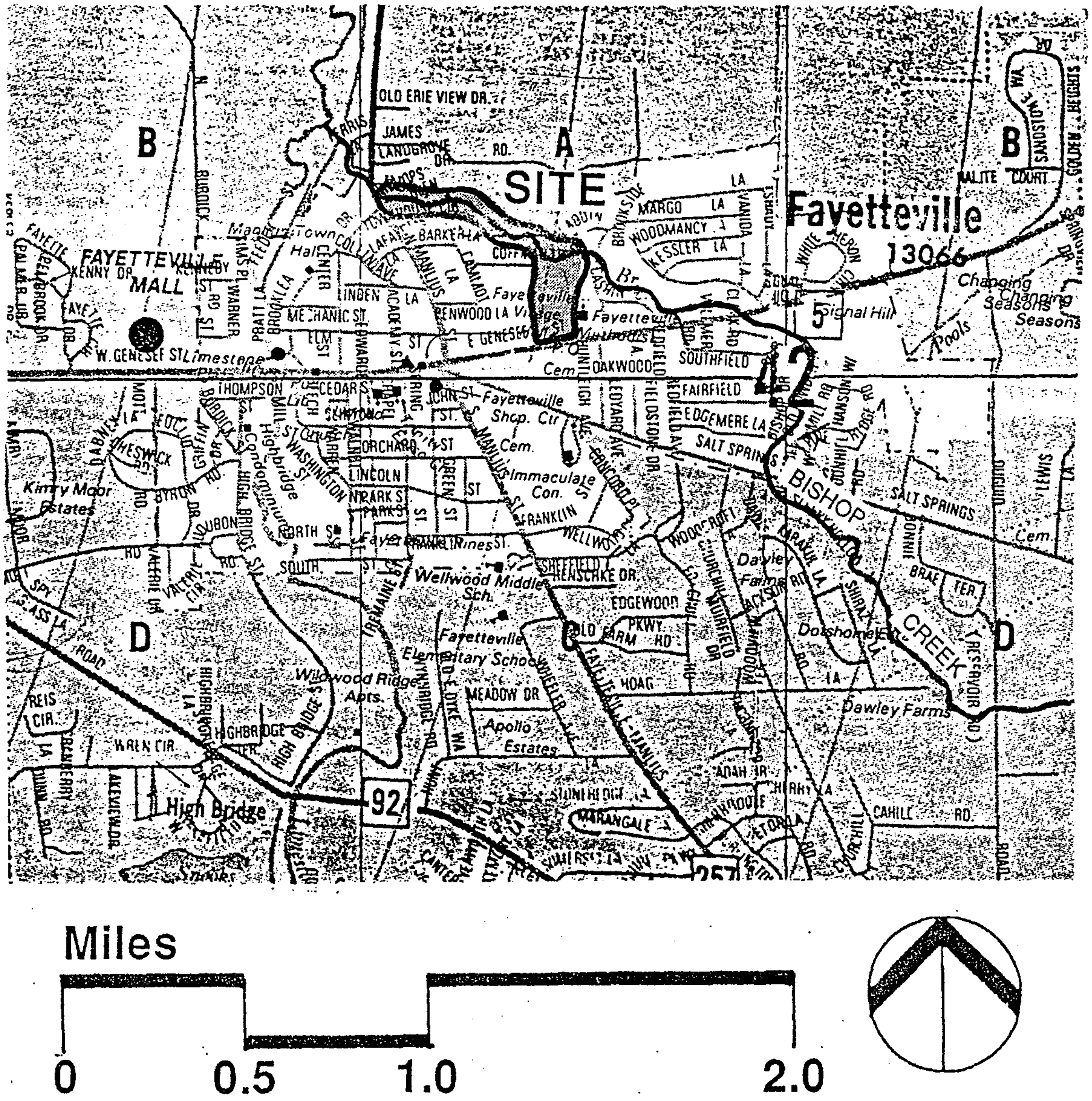
SITE PHOTOGRAPHS

7



5

SITE PHOTOGRAPHS

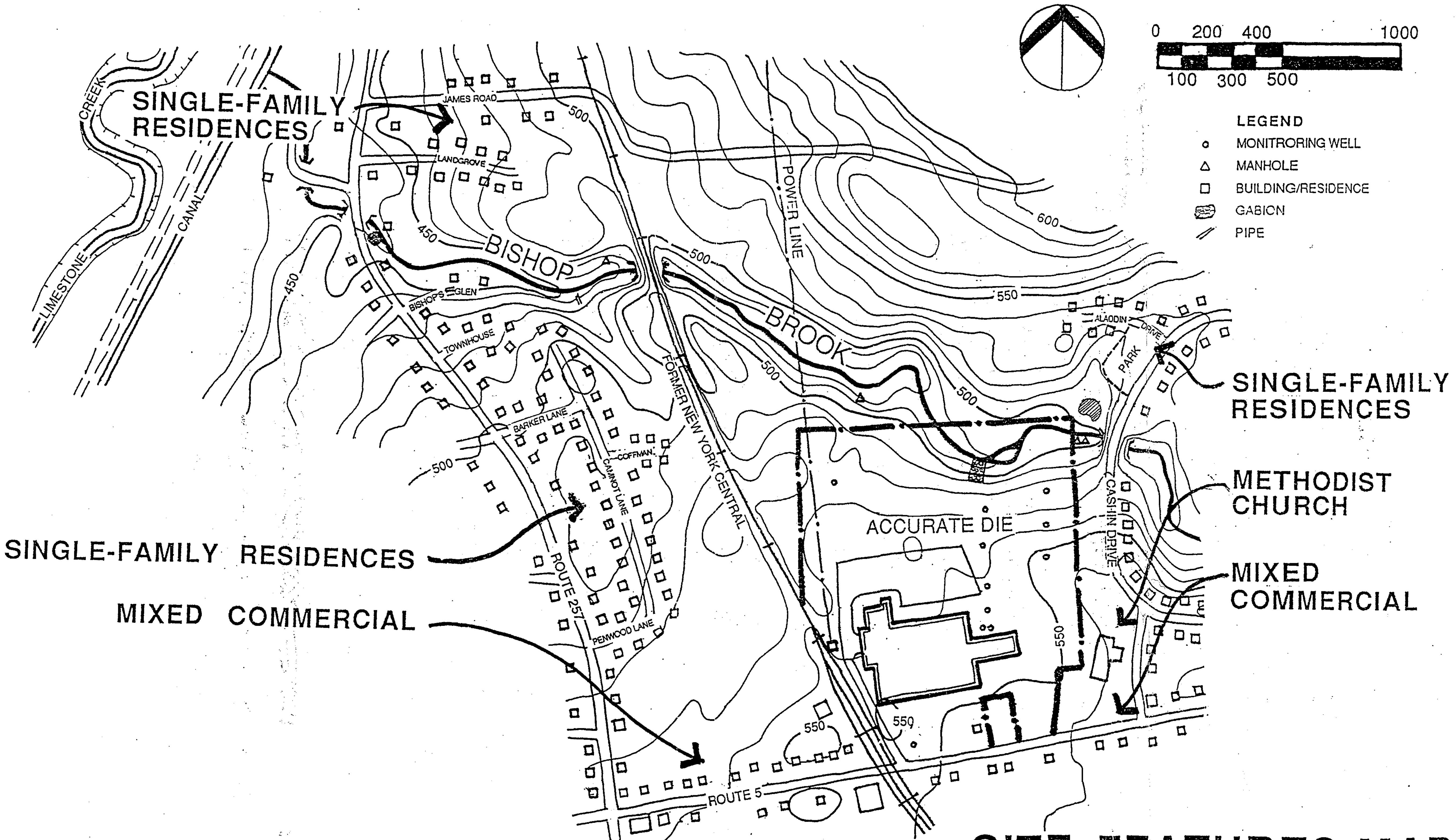


KEY MAP

Drawn
Date
Approved
Job No.
Sheet No.
L1

Stearns & Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS

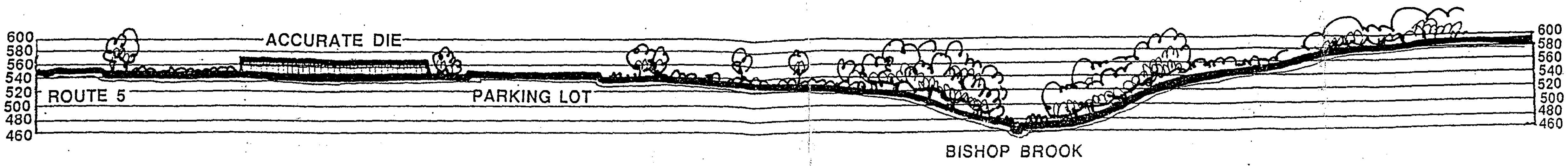
Cazenovia, New York
Watertown, New York Darien, Connecticut
Bedford, New Hampshire



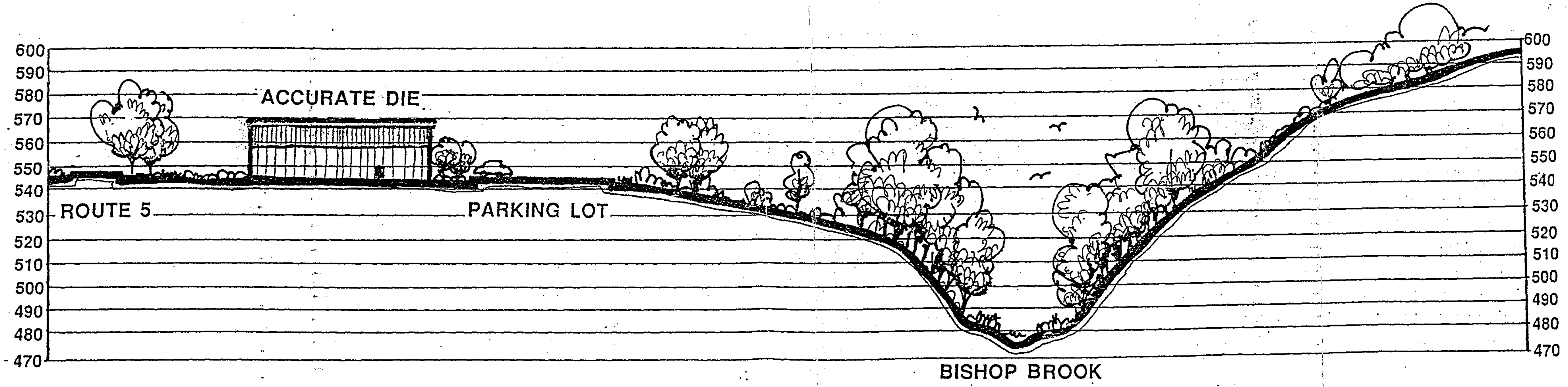
SITE FEATURES MAP

Drawn
Date
Approved
Job No.
Sheet No.
L2

Stearns & Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS
Cazenovia, New York
Watertown, New York Darien, Connecticut
Bedford, New Hampshire



SITE SECTION - TRUE SCALE

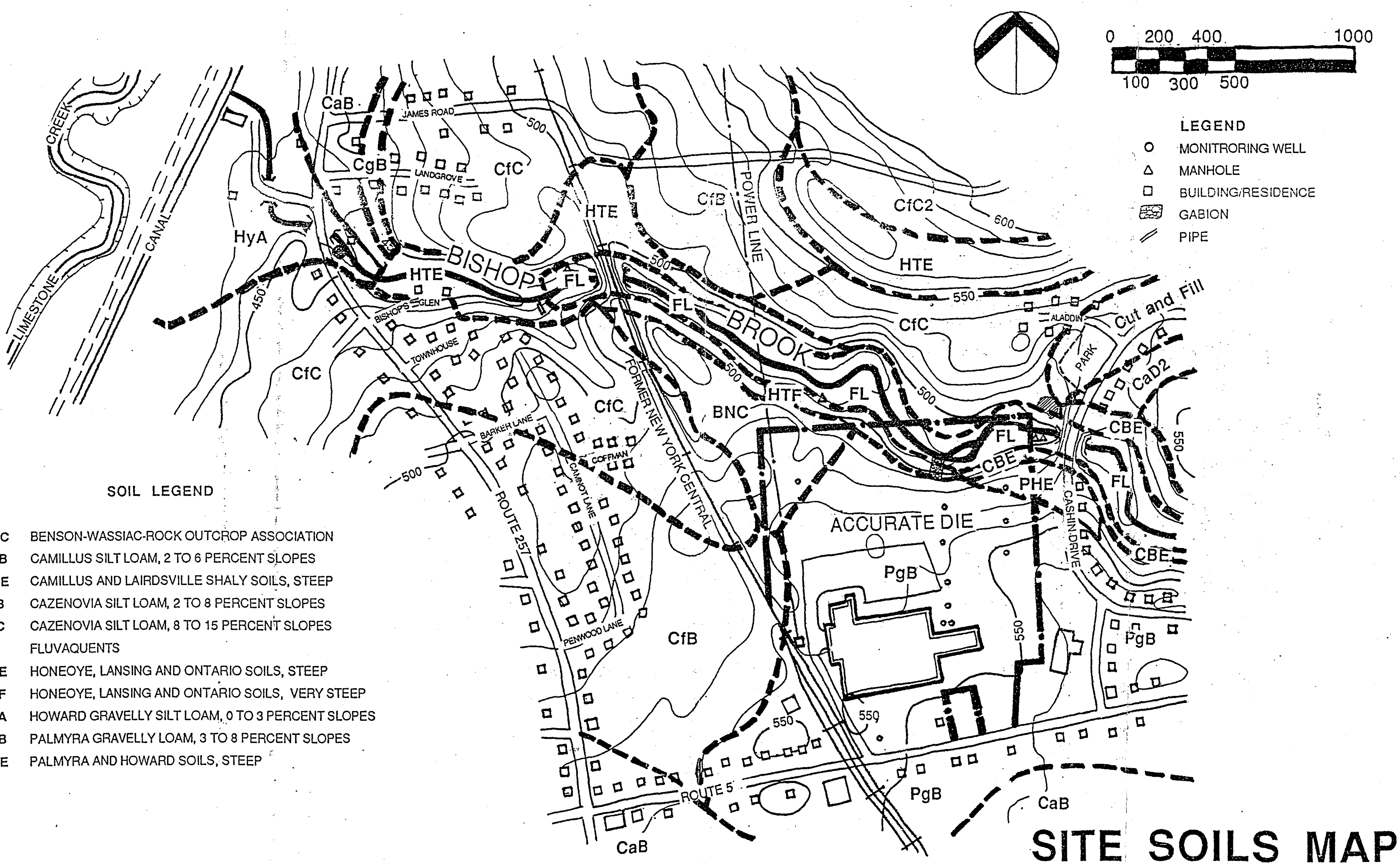


SITE SECTION - 4:1 EXAGGERATED SCALE

ILLUSTRATIVE SITE SECTION

Drawn
Date
Approved
Job No.
Sheet No. L3

Stearns & Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS
Cazenovia, New York
Watertown, New York Darien, Connecticut
Bedford, New Hampshire



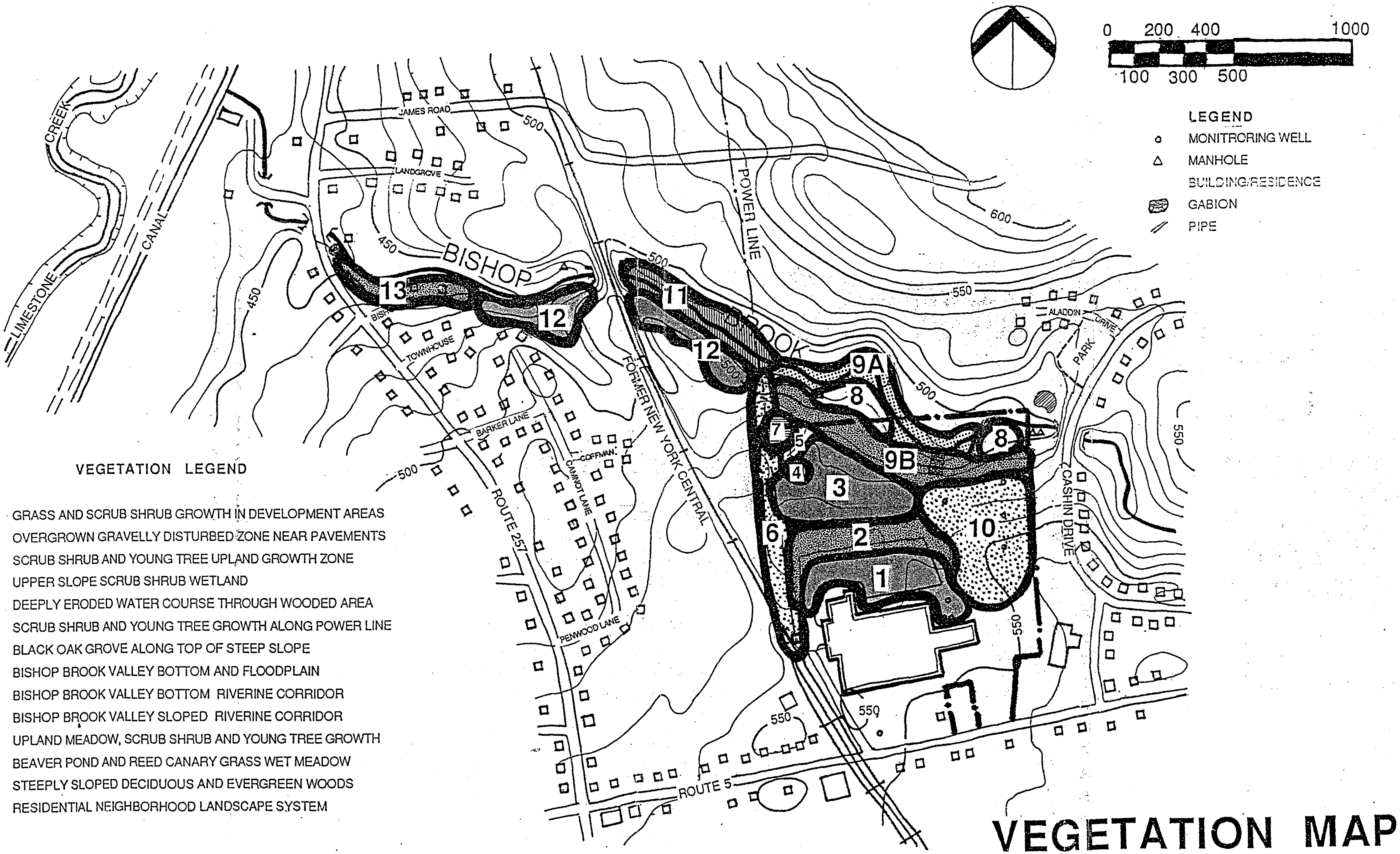
SOIL LEGEND

BNC	BENSON-WASSIAC-ROCK OUTCROP ASSOCIATION
CaB	CAMILLUS SILT LOAM, 2 TO 6 PERCENT SLOPES
CBE	CAMILLUS AND LAIRDSVILLE SHALY SOILS, STEEP
CfB	CAZENOVIA SILT LOAM, 2 TO 8 PERCENT SLOPES
CfC	CAZENOVIA SILT LOAM, 8 TO 15 PERCENT SLOPES
FL	FLUVAQUENTS
HTE	HONEOYE, LANSING AND ONTARIO SOILS, STEEP
HTF	HONEOYE, LANSING AND ONTARIO SOILS, VERY STEEP
HyA	HOWARD GRAVELLY SILT LOAM, 0 TO 3 PERCENT SLOPES
PgB	PALMYRA GRAVELLY LOAM, 3 TO 8 PERCENT SLOPES
PHE	PALMYRA AND HOWARD SOILS, STEEP

SITE SOILS MAP

Drawn	Date
Approved	
Job No.	Sheet No. L4

Stearns & Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS
Cazenovia, New York
Watertown, New York Darien, Connecticut
Bedford, New Hampshire

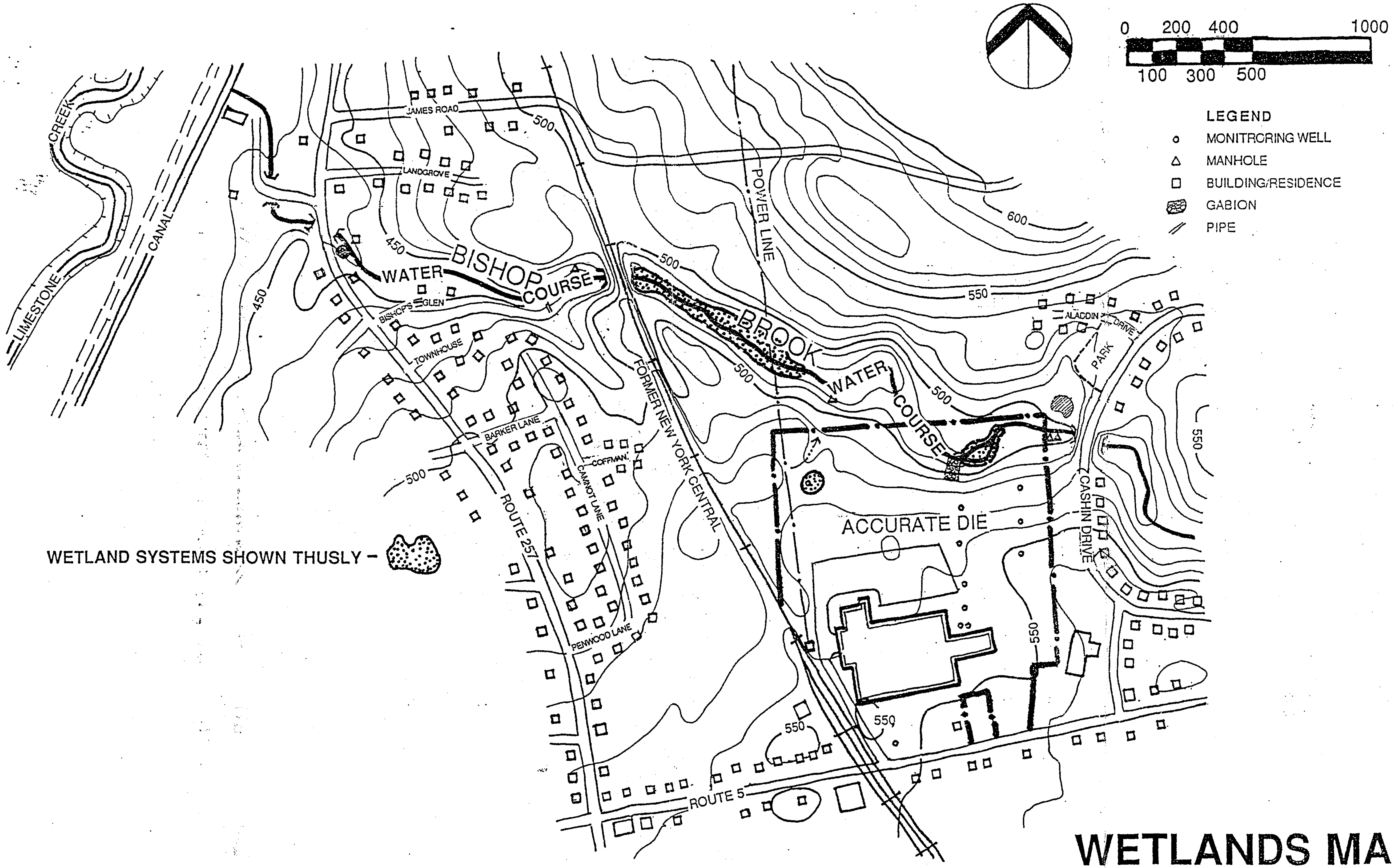


VEGETATION LEGEND

AREA 1	GRASS AND SCRUB SHRUB GROWTH IN DEVELOPMENT AREAS
AREA 2	OVERGROWN GRAVELLY DISTURBED ZONE NEAR PAVEMENTS
AREA 3	SCRUB SHRUB AND YOUNG TREE UPLAND GROWTH ZONE
AREA 4	UPPER SLOPE SCRUB SHRUB WETLAND
AREA 5	DEEPLY ERODED WATER COURSE THROUGH WOODED AREA
AREA 6	SCRUB SHRUB AND YOUNG TREE GROWTH ALONG POWER LINE
AREA 7	BLACK OAK GROVE ALONG TOP OF STEEP SLOPE
AREA 8	BISHOP BROOK VALLEY BOTTOM AND FLOODPLAIN
AREA 9A	BISHOP BROOK VALLEY BOTTOM RIVERINE CORRIDOR
AREA 9B	BISHOP BROOK VALLEY SLOPED RIVERINE CORRIDOR
AREA 10	UPLAND MEADOW, SCRUB SHRUB AND YOUNG TREE GROWTH
AREA 11	BEAVER POND AND REED CANARY GRASS WET MEADOW
AREA 12	STEEPLY SLOPED DECIDUOUS AND EVERGREEN WOODS
AREA 13	RESIDENTIAL NEIGHBORHOOD LANDSCAPE SYSTEM

VEGETATION MAP

Drawn	Date	Stearns & Wheler ENVIRONMENTAL ENGINEERS & SCIENTISTS Cazenovia, New York Watertown, New York Darien, Connecticut Bedford, New Hampshire
Approved		
Job No.	Sheet No. L5	



WETLANDS MAP

Drawn	Date
Approved	
Job No.	Sheet No. L6

Stearns & Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS
Cazenovia, New York
Watertown, New York Darien, Connecticut
Bedford, New Hampshire

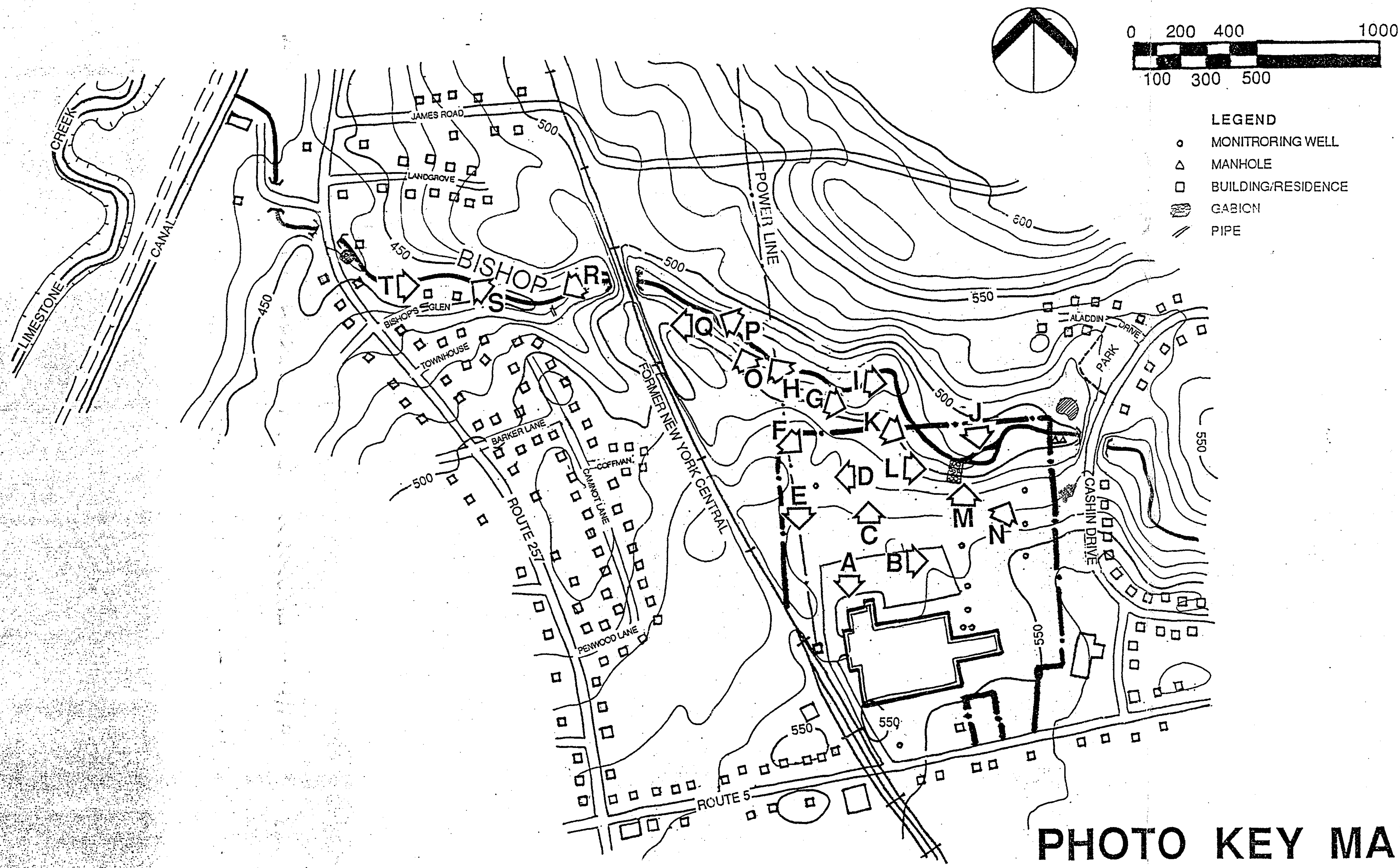


PHOTO KEY MAP

Drawn
Date
Approved
Job No.
Sheet No. L7

Stearns & Wheler
ENVIRONMENTAL ENGINEERS & SCIENTISTS
Cazenovia, New York
Watertown, New York Darien, Connecticut
Bedford, New Hampshire

APPENDIX G

NYSDEC CORRESPONDENCE

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

- orig to file

answered 6/14

June 7, 1993

T. Lawrence Hineline, C.P.G.
Senior Project Manager
Stearns & Wheler
One Remington Park Drive
Cazenovia, New York 13035

Dear Mr. Hineline:

RE: Accurate Die Casting
Site No. 7-34-052

The responses provided by you for the NYSDEC's comments on the draft RI report were reviewed and accepted except for the following:

Comment Nos. 11 and 24:

To study the groundwater movement in the bedrock zone, the DEC's comment suggested that one deep monitoring well to the south and one to the west of the site should be installed. To make a fairly good assumption on the migration of groundwater in the bedrock, wells towards the south and west of the site are needed because currently no data exists. Also, to evaluate the remedial technologies for the contaminated groundwater in the bedrock, it is critical to determine the groundwater pathways and the extent of contamination. From your response letter, it is our understanding that initially one deep monitoring well would be installed and based on the results, more studies would be conducted later. Instead of doing it in phases, installing two deep wells initially will provide better and more complete information.

Comment No. 15:

Please explain whether the material in the septic tank identified in the RI Report will be addressed in the FS Report for remediation? Do you have an estimated volume of material in the septic tank? If not, please provide measure to determine the volume of the material in the septic tank.

Page 6 of the response letter:

Please refer to the last paragraph on page 6 of your response letter. The representative samples from the oil spill area should also be analyzed for semi-volatiles because the derivatives of the spilled oil may be present in the soil residue.

During the telephone conversation with you on June 1, 1993, you stated that you will include the above mentioned tasks along with the tasks discussed in the letter in your work plan to conduct the supplemental field work at the site. Please submit the work plan by June 18, 1993. If you have any questions or need more information, please call me at (518) 457-0315.

Sincerely,

Vivek Nattanmai, P.E.
Project Manager
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: H. Hamel, NYSDOH, Syracuse
D. Stone, Stearns & Wheler
D. Harkawick, Esq., LeBoef, Lamb, Leiby and MacRae
A. Witte, ITT
R. Mann, ITT

VN/bs

TCH

Stearns &
Wheler

ENVIRONMENTA
ENGINEERS & SCIENTIST

May 7, 1993

Vivek Nattanmai, P.E.
Project Manager
Division of Hazardous Waste Remediation
NYSDEC
50 Wolf Road
Albany, NY 12233

Re: Response to Comments
Accurate Die Casting RI/FS
Site No. 7-34-052

Dear Mr. Nattanmai:

This letter is written in response to your March 30, 1993 comments on our draft RI Report. We will respond to your letter item by item using a numerical reference to your comments. Before responding to each individual item, I will respond to your general comment at the beginning of your letter. You stated that the Report seems to be incomplete because it does not represent the data and findings of the previous investigations. This was clearly our objective and approach and was stated as such in the original project proposal and in the approved work plan. We do believe we did discuss the important and critical findings and conclusions from previous investigations. Otherwise, reviewers of the document can refer to the previous reports. The most we would have done is attach the other reports to this one as appendices. Because DEC is in possession of these reports, we felt that this was not necessary.

We will now respond to the individual comments.

1. A brief discussion regarding the release of waste oil will be incorporated into a Report revision.

2. A description of voluntary IRMs related to sampling in the transformer area and the removal of transformers will be included in a revision of the Report.

3. The units for reporting concentrations of TCE in soil samples will be corrected from milligrams per liter to milligrams per kilogram.

4. Figure 2-3 which shows the locations of sampling points, will be modified with an inset that will show, in detail, the locations of borings B12 through B16.

5. A discussion on the significance of prior measurements of TCE concentrations in the seep will be added to a revision of the Report.

One Remington Park Drive
Cazenovia, New York 13035
(315) 655-8161 Fax (315) 655-4180

Cazenovia, New York
Amherst, New York • Darien, Connecticut
Bedford, New Hampshire • Bowie, Maryland

6. NYSDEC is suggesting that the gabions may only be a short term IRM in the seep area. The ultimate handling of the seep, in terms of remediation or other action, will be evaluated in the Feasibility Study portion of this project.

7. Table 2-1 will be corrected to show that the turbidity units are NTUs. NYSDEC reminded us that it has been clearly stated in an earlier comment letter that groundwater samples having a turbidity value above 50 NTU should not be recommended for analytical purposes. These samples were evaluated for the following reasons: because of the very fine grained nature of sediments in the area, lower turbidities are difficult to achieve despite proper development and careful sampling techniques; because the contaminants of concern at the site are volatile organic compounds, turbidity is not the significant concern that it would be if metals were the contaminant of concern; the turbidity would not necessarily impact the analytical results of the VOC analysis; were the samples with turbidities over 50 NTUs not evaluated, this would have limited our data set to the point of not being useful to draw any reasonable conclusions, we therefore proceeded with analysis of all groundwater samples.

8. The location of sample BB4 on Figure 2-3 was an error. Figure 2-3 will be revised to show sample BB4 approximately 40 feet downstream of the seep. Sediment sample locations were revised following the work plan, based on field reconnaissance. We selected sampling points where the deposition of sediment would have been most probable based on stream characteristics.

9. The paragraph describing the impact of the till layer will be modified in the report. Although the till layer did have the apparent capability of reducing downward flow of free product as evidenced by the pool of free product encountered in Well 3, it is apparent, based on the results of Wells 10 and 11, that dissolved phase TCE has reached bedrock aquifer.

10. Groundwater contour maps will be constructed for the 5/28/92 and 8/7/92 sampling events. As noted by NYSDEC, the water level in MW-1 does suggest a component of flow towards the south. There are no readily apparent reasons for flow to the south. Surface water occurrence and site topography suggest flow to the north. It may be the impacts of man made changes such as drainage and paving that are effecting direction of flow.

11. Our assumption that bedrock groundwater is moving towards the north was based on topography, surface water occurrence, regional groundwater flow, and relative groundwater elevations between Wells 10 and 11 and Well 7. We concur that there is not hard, fast data to support groundwater flow to the north. Determining the direction of groundwater flow in bedrock, however, is not as simple a task as determining groundwater flow through overburden materials. Because groundwater flow in bedrock is through fractures and different fracture sets, wells completed in different areas for the purpose of triangulating the direction of flow may not necessarily be in the same flow system. We therefore believe that it is not worth installing sufficient bedrock wells to attempt to triangulate flow because the results would not be conclusive.

    The main concern here is the question of TCE migration to the south in the bedrock aquifer. To investigate this initially, we are proposing one bedrock well on the south side of the building in the immediate vicinity of MW-1. Our reason for twinning MW-1 is so that we can sample MW-1 (if water levels allow) to confirm little or no TCE in the overburden aquifer in that area. It is our intent to avoid cross contamination by drilling through a contaminated portion of the overburden aquifer. We will then complete a well into bedrock next to Well MW-1 by double casing it so as to protect the bedrock aquifer from the groundwater in the overburden aquifer. The bedrock well located in the front of the building will be sampled. From those results, a preliminary evaluation will be made as to the potential for movement of contaminated groundwater to the south.

12. Organic compounds other than TCE were considered insignificant in MW-3. A review of the data set and validation report indicated that there had been a 5,000 fold dilution of the MW-3 sample because of the high levels of TCE. As a result, the CRQL for the various VOCs was 50,000 parts per million. Because of this, concentrations of other compounds were at levels that range from 6 to approximately 50 percent of the CRQL. Because of the dilution and the resultant CRQL, the values reported can be considered insignificant. This is supported by the fact that these compounds were not detected in any other wells.

13. Table 4-5 has been revised to include TCE in soil concentrations from prior phases of investigation.

14. As stated in the notes on Figure 4-1, TCE concentrations were contoured treating bedrock and overburden as a single unit, even though we have referred to bedrock as a separate hydraulic unit. NYSDEC's comment is valid that the map should only represent contouring of TCE in the overburden aquifer. The map will be changed by removing the note about contouring TCE concentrations as a single unit. The actual contours will not change.

15. The material in the septic tank with the elevated concentrations of zinc may be representative of waste streams of the facility. However, the material appears to be confined to the septic tank.

16. The soil vapor survey was not discussed in this report for two reasons: 1) two different soil surveys were attempted in different manors and the results were not consistent and were, therefore, considered unreliable. Additionally, sufficient actual sampling of groundwater and soil has occurred at the site to indicate that the results of either soil vapor survey were not particularly representative of site conditions because of the numerous variables inherent in completing a soil vapor survey. Even when completed with careful control over conditions, results are frequently inconclusive. The results of the soil vapor surveys have generally been disregarded as unrepresentative.

17. Because of the low concentrations of 1,2 dicloroethene detected in Wells MW-4, MW-5, and MW 6, and because those values were quantified with a flag during validation, the values were considered insignificant. However, it is not impossible that these low levels of 1,2 DEC could represent biodegradation of TCE. This possibility will be discussed in a revision of the report.

18. The language in Section 4.3A and on page 62 about potential bedrock groundwater discharge into Bishop Brook will be made consistent. Section 4.3A states that is assumed that Bishop Brook is a flow boundary for the bedrock aquifer. This is not necessarily suggesting that flow of groundwater is into Bishop Brook, at least at the site. Saying that the Brook is a flow boundary is also allowing for underflow and, perhaps, ultimate discharge to the brook downstream. Groundwater movement in bedrock to the north of Bishop Brook, in all probability, is to the south, also towards Bishop Brook. This could be independent of recharge to Bishop

Brook in the immediate vicinity of the site. There is no firm data to indicate that there is discharge to Bishop Brook from bedrock, but it is reasonable to assume that that may happen.

19. Because of the recent rezoning of the back side of the site to potential residential development, NYSDEC's concern about PCB levels in soils are valid. Twenty-five foot grid across the entire back portion of the site is excessive and unreasonable, however. PCBs were detected in the area of the oil discharge in the northwest corner of the site. Sampling will be conducted in the immediate area of the oil discharge and cleanup using a statistically based grid for an appropriate distribution of samples. Samples will also be collected from the soils in the transformer area, even though testing has been completed in this area previously with no PCBs detected.

20. It is assumed that the area referenced in comment 20 is the area of the stormwater outfall where the oil spill occurred in 1987. Historical records have been reviewed on this area. To the best of our knowledge, no analytical sampling took place at the time of discovery of the spill in this area. In 1987, NYSDEC managed a cleanup of this area in the form of excavating soils. In 1988, one soil sample was collected from the area in the center of the spill. Samples were analyzed for metals and volatile organic compounds. With the exception of natural levels of metals, all other analytes were below detection limits. In a previous detection phase, Stearns & Wheler resampled in the area of the outfall. Shallow soil samples were collected from up the hill, the center of the remedial area, and downhill from the remediated area. Samples were evaluated for volatile organic compounds and petroleum constituents. All samples were evaluated as nondetect. As stated in the response to comment 19, this area will be further evaluated for further PCB impacts. In the course of this investigation, a representative number of samples will be evaluated for petroleum compounds to confirm or refute whether the area was adequately remediated in the 1987 NYSDEC action.

21. Table 6-1 will be corrected to accurately reflect the NYSDOH and NYSDEC standard of five parts per billion.

22. The default value of 30 years for residential exposure was used to be consistent with the March 1991 revisions to USEPA's "Standard Default Exposure Factors" (OSWER Directive 9285.6-03). The March 1991 guidance document is a supplement to the October 1989 Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Part A.

    Residential exposure is calculated at 30 years, based on the 90th percentile estimate for time spent at one residence. In our judgement, this assumption appears to be adequately protective of human health. USEPA, through its Superfund program, is committed to moving away from values that represent the "worst possible case".

    We therefore conclude that the thirty-year exposure duration is reasonable for this site.

    If 70 years were utilized in the exposure assessment, the intake calculations would increase by a factor of 70/30 2.3 times. The ingestion of private water supply pathway risk would increase as follows (refer to Table 6 - 7 for comparisons):

Revisions to Table 6 - 7
Exposure Pathway: Ingestion of Private Water Supply

		Carcinogenic		Non-carcinogenic	
Chemical	Revised Exposure Magnitude (mg/Kg-d)	Slope Factor (Per Exposure)	Risk	Reference Dose	Risk
TCE	3.3E-03	1.1 E-02	3.63-05	--	--
Cr	2.83-02	NA	NA	6E-03	4.6
Sb	4.73-03	NA	NA	4E-04	11.8
Mn	9.1E-02	NA	NA	1E-01	9.1E-01
	Summed Risk per Pathway		3.6E-05 (carcinogenic)		17.3 (non-carcinogenic)

Exposure Pathway: Inhalation of Volatile Organics Revised

Chemical	Exposure Magnitude (Residential)	Slope Factor	Risk Residential
TCE	2.1E-03	1.7E-02	3.5E-05
PCE	9.1E-04	1.9E-03	4.4E-07
	Summed Risk: Residential		3.5E-05 (Carcinogenic)

The recalculations do not change the conclusions. Ingestion of impacted groundwater would be inadvisable using either 30 years or 70 years as the exposure duration. Inhalation of site-related volatile organic compounds results in the same order of magnitude risk (E-05) whether 30 years or 70 years is assumed. Further discussion of the risk posed by the inhalation pathway is presented in response to Item (23).

23. The discussion of acceptable risk to future residents posed by inhalation of site-related TCE and PCE was framed in terms of both ARAR's (what do the NYS Air Regulations consider acceptable ambient concentrations of TCE and PCE) and the risk calculations. As discussed in the text, the ARAR and the risk calculation do not appear to provide results congruent with the comment that acceptable risk is defined at 1 X 10^{-6} or less.

TCE concentrations measured in February 1990 were below the NYS air guidance values, yet produced a risk between 10^{-5} and 10^{-6}. Our conclusion that the residential exposure from this concentration would be 'acceptable' was based on comparing what risk New York State deemed acceptable for this chemical statewide. We would not agree that site conditions at Accurate Die Casting warrant a more stringent ambient air quality than is required at other sites. PCE concentrations in ambient air, however, exceed the draft air standards with a calculated risk in the 10^{-7} range. We present these calculations to highlight the challenge in defining what risk is acceptable using standard risk assessment procedures.

We agree that if 1E-06 is the cut-off point for risk due to exposure via inhalation regardless of ambient air standards, then our characterization is inaccurate. Risk due to inhalation of TCE is calculated to exceed this threshold. A second pathway of exposure would thus be considered to result in unacceptable risk to human health if the site were redeveloped for residential use.

24. There is no data available at this time to confirm or refute whether Accurate Die may be the source of TCE at Turf Taylor's at 100 Clinton Street in Fayetteville. The entire Village of Fayetteville lies between Accurate Die Casting and Turf Taylor's, so the probability of other sources of a solvent as common as TCE are high. The likelihood that TCE is migrating from the Accurate Die Casting to the Turf Taylor's site will be investigated in phases. The first phase will be addressed as discussed in the response item 11. This will entail the installation of a bedrock monitoring well on the south side of Accurate Die Casting to evaluate whether there is migration of TCE to the south in the bedrock at the Accurate site.

We will await your response to these preliminary comments. Assuming you find this response acceptable, we will provide to you a work plan in letter form that will discuss additional field work. Additional field work would entail the installation of one bedrock monitoring well on the south side of the facility, as well as shallow soil sampling for PCB analysis in the transformer area and in the area of the 1987 oil spill. Additionally, a representative number of samples from the oil spill area will be evaluated for total petroleum hydrocarbons to see if there is any residual following the NYSDEC cleanup action. Following the proposed field work and the receipt of analytical data, the RI Report will be revised to include new data and conclusions, as well as the changes discussed in this response letter.

If you have any comments or questions on the content of the this letter, please call.

Very truly yours,

T. Lawrence Hineline, C.P.G.
Senior Project Manager

TLH/dlo
001

cc: R. Mann
D. Harkowik
L. Kornreich

TLH
working/File
copy

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

March 30, 1993

T. Lawrence Hineline, C.P.G.
Senior Project Manager
Stearns & Wheler
One Remington Park Drive
Cazenovia, New York 13035

Dear Mr. Hineline:

RE: Review of Draft RI Report
Accurate Die Casting
Site No. 7-34-052

The draft RI report submitted by Stearns & Wheler has been reviewed. In general, the report seems to be incomplete in presenting the data and findings of the previous investigation. This report should be presented as a stand alone document as the final draft RI report. The report should include a separate section to provide the important and critical data, findings, and conclusions from previous investigation. The following are the comments from the Department after reviewing the draft RI report.

✓1) Section 1.3, page 1-2. This section should include the release of "waste oil" that occurred in 1987 and the subsequent cleanup activities undertaken by the NYSDEC. - add brief Sec. - Insert A

✓2) Section 2.1F, page 2-3. The voluntary IRM's completed at the site should include the sampling in the transformer area and the removal of transformers from the site. - add brief Sec Insert B

✓3) Section 2.1E, page 2-2. The units of concentration for TCE in soil samples should be mg/kg and not mg/l.

✓4) The locations of the soil boring Nos. B-12 thru B-16 were not shown in any of the figures in the report. Please redraw the figures to show these locations.
— - add insert to 2-1

✓5) Section 2.2C, page 2-7. This section should mention and discuss the results of the Phase II seep sample taken before it emerges which detected 700 ppb TCE. The possible contamination of the soil/sediment immediately adjacent to the seep should also be discussed. These discussions are necessary to justify whether the seep is contaminating the soil as it travels from the steep bank to the surface water or not and whether the volatilization process minimizes the contamination problem at the seep or not.

✓ 6) The report on page 6-4 says that the impacted seep has been covered by rocks and gravel-filled gabions as an IRM, thus greatly restricting any potential for direct contact, but, this IRM is only for short term purposes. Please clarify whether this IRM will be effective until the groundwater remediation is implemented at the site.

✓ 7) Table 2-1. Please provide the units for the turbidity measurements in the table. The report fails to provide any justification as to why groundwater samples having a turbidity value of greater than 50 NTU were used for chemical analyses (assuming that the units for turbidity is NTU in table 2-1). The State has clearly stated in the comment letter of November 15, 1993 that groundwater samples having a turbidity value above 50 NTU should not be recommended for analytical purposes.

✓ 8) The location of sample BB-4 on Figure 2-3 seems to be more than 300 feet downstream of the seep but the report on page 4-3 says that the location is 40 feet downstream from the seep. Please correct this error.

✓ 9) Section 3.3B, page 3-3. The statement that the till layer appears to have restricted the downward movement of TCE is not appropriate in the light of the fact that contamination was detected in bedrock wells MW-10 and MW-11. Please clarify.

✓ 10) Table 3-1 shows that the water level elevations were recorded on three occasions. But the groundwater contour map was produced for only one occasion in Figure 3-5. Please provide contour maps for all three occasions. The southerly component of the groundwater flow away from the building was seen in all the four occasions of water level measurements during the Phase II investigation. The water level measurements taken on August 7, 1992 shows the existence of a southerly component of flow at MW-1. Discussions should be provided in the report as to why this southerly component exists at the site. In Figure 3-5, the 60 foot contour line should curve to the southeast direction adjacent to well No. MW-12.

in addendum

in letter

a.

11) Section 3-4B, page 3-5. The assumption that bedrock groundwater is moving toward the north through bedding plane fractures, ultimately discharging to Bishop Brook is not acceptable because there is no bedrock groundwater data towards the west or south of the site. From the groundwater elevation data (Table 3-1), it looks like groundwater in bedrock flows from north (MW-10) to south (MW-11). To make a reasonable assumption of the groundwater flow, more bedrock wells need to be installed towards the west and south of the site. The extent of contamination in bedrock is still not known as stated in section 4.3A, page 4-3 which can be determined from these additional wells. The split spoon samples that would be collected during the installation of additional monitoring wells should be analyzed for site related contaminants and total organic carbon (TOC). The TOC data should be utilized in the FS to determine the clean-up levels using the water/soil partitioning theory, if applicable.

12) Chapter 4. It is agreed that the principal contaminant for the site is TCE, but other chemicals such as 4-methyl-2-pentanone (18,000 ppb), 2-Hexanone (26,000 ppb), 1,1,2,2-tetrachloroethane (6,600 ppb) and toluene (3,000 ppb) were also detected at the site. The report should identify the detection of these chemicals, the source for these chemicals, and discuss whether these chemicals would pose any risk or not as contaminants.

13) Section 4.3D, page 4-4. The conclusion made in this section on the contamination of TCE in subsurface soil was based on the data from the RI and Phase II investigations. Table 4-5 should include Phase II data also for quick reference.

14) The Figures for TCE concentration in groundwater should be drawn separately for overburden and bedrock. Figure 4-1 in the report combines the data from overburden and bedrock. This is incorrect. Please redraw this figure for only overburden wells. Since there is not enough data for bedrock wells, TCE concentration figure cannot be drawn now.

15) Table 4.10 shows that the sample ST-1 detected 644 ppm of zinc which seems to be high but was not identified or discussed in the report. This is the white material with a soil-like consistency which was found in the septic tank, as stated in page 2-8 of the report. This material needs to be quantified and additional sampling should be done to determine the possibility for removal and disposal.

16) The results of the Phase II soil vapor survey which detected TCE at all the locations were not included in any of the discussions on the contamination in the unsaturated zone. In particular, on page 5-4, 4th paragraph, the report asks the reviewer to refer to the Phase II RI report. The draft RI report should provide some details of the Phase II soil vapor survey results to clarify the statement made in that paragraph.

also in addendum

17) Page 5-5, last paragraph. Contrary to the statement in the report, 1,2-DCE was detected in overburden monitoring wells MW-4, MW-5 and MW-6. Please clarify.

18) In Section 4.3A the report <u>assumes</u> that bedrock groundwater discharges to Bishop Brook but on page 6-2, the reports states that the bedrock groundwater <u>appears</u> to discharge into Bishop Brook. These two statements are contradicting. Please explain.

results in addendum

19) Page 6-3. The report states that rezoning of the site property from industrial to residential has already begun. In that case, surface soil samples need to be taken at the site because, in a future residential scenario, the exposure from direct contact with surface soils is more than the exposure via groundwater consumption. The surface soils at the site should be collected in a 25 feet grid pattern. The samples that would be collected in the transformer area should be analyzed for PCB because the usual cleanup of PCB for unrestricted land use is 1 ppm at the surface.

in addendum accept?

20) The NYSDOH personnel visited the site on May 5, 1992 and pointed out to the consultant a substantial area which had stained soils and stressed vegetation. There was a chemical odor associated with this area. This area may be the 1987 waste oil spill area. The previous records for the waste oil cleanup activity should be reviewed to determine the level of contamination exist at the surface of this area. In the absence of any such data, samples should be taken to characterize this area.

21) On table 6-1 of the report, the 10 NYCRR Part 5 standard for 1,2-dichloroethene, tetrachloroethene, 1,1,2,2-tetrachloroethene, and toluene should be 5 ppb and not 50 ppb. Please correct.

22) On page 6-8, 6-9 and 6-10, the NYSDOH recommends a 70 year exposure duration for residential exposures which is a standard practice, rather than 30 years. Please recalculate.

23) Table 6-7. The summed risk of 1.6×10^{-5} for the inhalation of TCE and PCE by residents is not an "acceptable" risk. It will be acceptable if the value is 1×10^{-6} or less.

24) A listed hazardous waste site, Turf Tailors, (#7-34-038) is located at 100 Clinton Street, Fayetteville. This site is approximately 3500 feet southwest of Accurate Die Casting. During a Phase II Site Assessment Investigation conducted at the Turf Tailors site, an artesian well at the site was sampled and analyzed. This sample was found to contain 39 ppb of TCE. The owner of the Turf Tailors site has been involved in the lawn care and landscaping business since the early 1980's. The previous activities at the site does involve the storage and handling of pesticides and lawn care chemicals and <u>not</u> TCE. The Department believes that the TCE contamination in the bedrock at Accurate Die Casting may have migrated to the Turf Tailors site. Please discuss.

Please provide responses to these comments by April 19, 1993. The final RI report should be prepared only after the responses are accepted by the Department. If you have any questions, please call me at (518) 457-0315.

Sincerely,

Vivek Nattanmai, P.E.
Project Manager
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation

cc: H. Hamel, NYSDOH, Syracuse
D. Stoner, Stearns & Wheler
D. Harkawick, Esq., LeBoef, Lamb, Leiby and MacRae

A. Witte, ITT
R. Mann, ITT

VN/bs

APPENDIX H

ANALYTICAL RESULTS

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/17/93

SAMPLE ID: DUP
LAB ID: 1765118
DIL FACTOR: 5.00
% MOISTURE: 30

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	2500.0
2	208-96-8	Acenaphthylene	2400.0 U.
3	83-32-9	Acenaphthene	9500.0
4	86-73-7	Fluorene	6700.0
5	85-01-8	Phenanthrene	18000.0
6	120-12-7	Anthracene	11000.0
7	206-44-0	Fluoranthene	21000.0
8	129-00-0	Pyrene	60000.0 E.
9	56-55-3	Benzo(a)Anthracene	18000.0
10	218-01-9	Chrysene	24000.0 E.
11	205-99-2	Benzo(b)Fluoranthene	10000.0
12	207-08-9	Benzo(k)Fluoranthene	12000.0
13	50-32-8	Benzo(a)Pyrene	15000.0
14	193-39-5	Indeno(1,2,3-cd)Pyrene	8800.0
15	53-70-3	Dibenz(a,h)Anthracene	2400.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	8000.0

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: DUPDL
LAB ID: 1765118
DIL FACTOR: 24.00
% MOISTURE: 30

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	2700.0 DJ
2	208-96-8	Acenaphthylene	11000.0 U.
3	83-32-9	Acenaphthene	11000.0 DJ
4	86-73-7	Fluorene	8800.0 DJ
5	85-01-8	Phenanthrene	47000.0 D.
6	120-12-7	Anthracene	15000.0 D.
7	206-44-0	Fluoranthene	49000.0 D.
8	129-00-0	Pyrene	49000.0 D.
9	56-55-3	Benzo(a)Anthracene	19000.0 D.
10	218-01-9	Chrysene	24000.0 D.
11	205-99-2	Benzo(b)Fluoranthene	12000.0 D.
12	207-08-9	Benzo(k)Fluoranthene	13000.0 D.
13	50-32-8	Benzo(a)Pyrene	15000.0 D.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	11000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	11000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	11000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-1
CONC. LEVEL:	LOW	LAB ID:	1765104
EXTRACTION DATE:	8/2/93	DIL FACTOR:	2.00
ANALYSIS DATE:	8/14/93	% MOISTURE:	17

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	800.0 U.
2	208-96-8	Acenaphthylene	800.0 U.
3	83-32-9	Acenaphthene	800.0 U.
4	86-73-7	Fluorene	800.0 U.
5	85-01-8	Phenanthrene	180.0 J.
6	120-12-7	Anthracene	800.0 U.
7	206-44-0	Fluoranthene	150.0 J.
8	129-00-0	Pyrene	430.0 J.
9	56-55-3	Benzo(a)Anthracene	800.0 U.
10	218-01-9	Chrysene	800.0 U.
11	205-99-2	Benzo(b)Fluoranthene	800.0 U.
12	207-08-9	Benzo(k)Fluoranthene	800.0 U.
13	50-32-8	Benzo(a)Pyrene	800.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	800.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	800.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	800.0 U.

1B PAH
NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: S-1RE
LAB ID: 1765104
DIL FACTOR: 2.00
% MOISTURE: 17

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	800.0 U.
2	208-96-8	Acenaphthylene	800.0 U.
3	83-32-9	Acenaphthene	800.0 U.
4	86-73-7	Fluorene	800.0 U.
5	85-01-8	Phenanthrene	190.0 J.
6	120-12-7	Anthracene	190.0 J.
7	206-44-0	Fluoranthene	160.0 J.
8	129-00-0	Pyrene	340.0 J.
9	56-55-3	Benzo(a)Anthracene	800.0 U.
10	218-01-9	Chrysene	110.0 J.
11	205-99-2	Benzo(b)Fluoranthene	800.0 U.
12	207-08-9	Benzo(k)Fluoranthene	800.0 U.
13	50-32-8	Benzo(a)Pyrene	800.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	800.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	800.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	800.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/17/93

SAMPLE ID: S-10

LAB ID: 1765110

DIL FACTOR: 30.00

% MOISTURE: 22

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	13000.0 U.
2	208-96-8	Acenaphthylene	13000.0 U.
3	83-32-9	Acenaphthene	13000.0 U.
4	86-73-7	Fluorene	13000.0 U.
5	85-01-8	Phenanthrene	5900.0 J.
6	120-12-7	Anthracene	4000.0 J.
7	206-44-0	Fluoranthene	7300.0 J.
8	129-00-0	Pyrene	6700.0 J.
9	56-55-3	Benzo(a)Anthracene	7100.0 J.
10	218-01-9	Chrysene	10000.0 J.
11	205-99-2	Benzo(b)Fluoranthene	6100.0 J.
12	207-08-9	Benzo(k)Fluoranthene	5400.0 J.
13	50-32-8	Benzo(a)Pyrene	6000.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	13000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	13000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	13000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: S-10RE
LAB ID: 1765110
DIL FACTOR: 30.00
% MOISTURE: 22

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	13000.0 U.
2	208-96-8	Acenaphthylene	13000.0 U.
3	83-32-9	Acenaphthene	13000.0 U.
4	86-73-7	Fluorene	13000.0 U.
5	85-01-8	Phenanthrene	6100.0 J.
6	120-12-7	Anthracene	4800.0 J.
7	206-44-0	Fluoranthene	7300.0 J.
8	129-00-0	Pyrene	7300.0 J.
9	56-55-3	Benzo(a)Anthracene	4400.0 J.
10	218-01-9	Chrysene	14000.0
11	205-99-2	Benzo(b)Fluoranthene	6400.0 J.
12	207-08-9	Benzo(k)Fluoranthene	4400.0 J.
13	50-32-8	Benzo(a)Pyrene	6200.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	13000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	13000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	13000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/17/93

SAMPLE ID: S-11
LAB ID: 1765119
DIL FACTOR: 5.00
% MOISTURE: 28

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	2000.0 U.
2	208-96-8	Acenaphthylene	2000.0 U.
3	83-32-9	Acenaphthene	2000.0 U.
4	86-73-7	Fluorene	2000.0 U.
5	85-01-8	Phenanthrene	270.0 J.
6	120-12-7	Anthracene	2000.0 U.
7	206-44-0	Fluoranthene	2000.0 U.
8	129-00-0	Pyrene	220.0 J.
9	56-55-3	Benzo(a)Anthracene	2000.0 U.
10	218-01-9	Chrysene	2000.0 U.
11	205-99-2	Benzo(b)Fluoranthene	2000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	2000.0 U.
13	50-32-8	Benzo(a)Pyrene	2000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	2000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	2000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	2000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/18/93

SAMPLE ID: S-11RE

LAB ID: 1765119

DIL FACTOR: 5.00

% MOISTURE: 28

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	2000.0 U.
2	208-96-8	Acenaphthylene	2000.0 U.
3	83-32-9	Acenaphthene	2000.0 U.
4	86-73-7	Fluorene	2000.0 U.
5	85-01-8	Phenanthrene	260.0 J.
6	120-12-7	Anthracene	2000.0 U.
7	206-44-0	Fluoranthene	2000.0 U.
8	129-00-0	Pyrene	2000.0 U.
9	56-55-3	Benzo(a)Anthracene	2000.0 U.
10	218-01-9	Chrysene	2000.0 U.
11	205-99-2	Benzo(b)Fluoranthene	2000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	2000.0 U.
13	50-32-8	Benzo(a)Pyrene	2000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	2000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	2000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	2000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/17/93

SAMPLE ID: S-12
LAB ID: 1765114
DIL FACTOR: 30.00
% MOISTURE: 17

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	12000.0 U.
2	208-96-8	Acenaphthylene	12000.0 U.
3	83-32-9	Acenaphthene	12000.0 U.
4	86-73-7	Fluorene	12000.0 U.
5	85-01-8	Phenanthrene	14000.0
6	120-12-7	Anthracene	2300.0 J.
7	206-44-0	Fluoranthene	15000.0
8	129-00-0	Pyrene	11000.0 J.
9	56-55-3	Benzo(a)Anthracene	9900.0 J.
10	218-01-9	Chrysene	13000.0
11	205-99-2	Benzo(b)Fluoranthene	8400.0 J.
12	207-08-9	Benzo(k)Fluoranthene	7900.0 J.
13	50-32-8	Benzo(a)Pyrene	9600.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	12000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	12000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	12000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: S-12RE
LAB ID: 1765114
DIL FACTOR: 30.00
% MOISTURE: 17

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	12000.0 U.
2	208-96-8	Acenaphthylene	12000.0 U.
3	83-32-9	Acenaphthene	2000.0 J.
4	86-73-7	Fluorene	12000.0 U.
5	85-01-8	Phenanthrene	15000.0
6	120-12-7	Anthracene	6000.0 J.
7	206-44-0	Fluoranthene	17000.0
8	129-00-0	Pyrene	11000.0 J.
9	56-55-3	Benzo(a)Anthracene	13000.0
10	218-01-9	Chrysene	17000.0
11	205-99-2	Benzo(b)Fluoranthene	8900.0 J.
12	207-08-9	Benzo(k)Fluoranthene	8400.0 J.
13	50-32-8	Benzo(a)Pyrene	9000.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	12000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	12000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	12000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/16/93

SAMPLE ID: S-13
LAB ID: 1765111
DIL FACTOR: 30.00
% MOISTURE: 20

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	12000.0 U.
2	208-96-8	Acenaphthylene	12000.0 U.
3	83-32-9	Acenaphthene	12000.0 U.
4	86-73-7	Fluorene	12000.0 U.
5	85-01-8	Phenanthrene	12000.0 U.
6	120-12-7	Anthracene	12000.0 U.
7	206-44-0	Fluoranthene	8100.0 J.
8	129-00-0	Pyrene	3900.0 J.
9	56-55-3	Benzo(a)Anthracene	4100.0 J.
10	218-01-9	Chrysene	14000.0
11	205-99-2	Benzo(b)Fluoranthene	3100.0 J.
12	207-08-9	Benzo(k)Fluoranthene	2400.0 J.
13	50-32-8	Benzo(a)Pyrene	1800.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	12000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	12000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	12000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-13RE
CONC. LEVEL:	LOW	LAB ID:	1765111
EXTRACTION DATE:	8/2/93	DIL FACTOR:	30.00
ANALYSIS DATE:	8/18/93	% MOISTURE:	20

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	12000.0 U.
2	208-96-8	Acenaphthylene	12000.0 U.
3	83-32-9	Acenaphthene	3500.0 J.
4	86-73-7	Fluorene	12000.0 U.
5	85-01-8	Phenanthrene	10000.0 J.
6	120-12-7	Anthracene	12000.0 U.
7	206-44-0	Fluoranthene	9300.0 J.
8	129-00-0	Pyrene	7700.0 J.
9	56-55-3	Benzo(a)Anthracene	7400.0 J.
10	218-01-9	Chrysene	16000.0
11	205-99-2	Benzo(b)Fluoranthene	5700.0 J.
12	207-08-9	Benzo(k)Fluoranthene	5100.0 J.
13	50-32-8	Benzo(a)Pyrene	5400.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	12000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	12000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	12000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/14/93

SAMPLE ID: S-14

LAB ID: 1765105

DIL FACTOR: 30.00

% MOISTURE: 29

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	14000.0 U.
2	208-96-8	Acenaphthylene	14000.0 U.
3	83-32-9	Acenaphthene	14000.0 U.
4	86-73-7	Fluorene	14000.0 U.
5	85-01-8	Phenanthrene	24000.0
6	120-12-7	Anthracene	3300.0 J.
7	206-44-0	Fluoranthene	20000.0
8	129-00-0	Pyrene	13000.0 J.
9	56-55-3	Benzo(a)Anthracene	8300.0 J.
10	218-01-9	Chrysene	17000.0
11	205-99-2	Benzo(b)Fluoranthene	6300.0 J.
12	207-08-9	Benzo(k)Fluoranthene	5400.0 J.
13	50-32-8	Benzo(a)Pyrene	6400.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	14000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	14000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	14000.0 U.

nytest environmental inc

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: S-14RE
LAB ID: 1765105
DIL FACTOR: 30.00
% MOISTURE: 29

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	14000.0 U.
2	208-96-8	Acenaphthylene	14000.0 U.
3	83-32-9	Acenaphthene	2800.0 J.
4	86-73-7	Fluorene	2600.0 J.
5	85-01-8	Phenanthrene	22000.0
6	120-12-7	Anthracene	2300.0 J.
7	206-44-0	Fluoranthene	17000.0
8	129-00-0	Pyrene	12000.0 J.
9	56-55-3	Benzo(a)Anthracene	12000.0 J.
10	218-01-9	Chrysene	14000.0
11	205-99-2	Benzo(b)Fluoranthene	7700.0 J.
12	207-08-9	Benzo(k)Fluoranthene	6700.0 J.
13	50-32-8	Benzo(a)Pyrene	7700.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	14000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	14000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	14000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/13/93

SAMPLE ID: S-15
LAB ID: 1765108
DIL FACTOR: 10.00
% MOISTURE: 68

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	10000.0 U.
2	208-96-8	Acenaphthylene	10000.0 U.
3	83-32-9	Acenaphthene	10000.0 U.
4	86-73-7	Fluorene	10000.0 U.
5	85-01-8	Phenanthrene	1700.0 J.
6	120-12-7	Anthracene	1300.0 J.
7	206-44-0	Fluoranthene	1300.0 J.
8	129-00-0	Pyrene	1400.0 J.
9	56-55-3	Benzo(a)Anthracene	10000.0 U.
10	218-01-9	Chrysene	10000.0
11	205-99-2	Benzo(b)Fluoranthene	10000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	10000.0 U.
13	50-32-8	Benzo(a)Pyrene	1300.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	10000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	10000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	10000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-15RE
CONC. LEVEL:	LOW	LAB ID:	1765108
EXTRACTION DATE:	8/2/93	DIL FACTOR:	10.00
ANALYSIS DATE:	8/17/93.	% MOISTURE:	68

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	10000.0 U.
2	208-96-8	Acenaphthylene	10000.0 U.
3	83-32-9	Acenaphthene	10000.0 U.
4	86-73-7	Fluorene	10000.0 U.
5	85-01-8	Phenanthrene	10000.0 U.
6	120-12-7	Anthracene	10000.0 U.
7	206-44-0	Fluoranthene	10000.0 U.
8	129-00-0	Pyrene	1400.0 J.
9	56-55-3	Benzo(a)Anthracene	2500.0 J.
10	218-01-9	Chrysene	9600.0 J.
11	205-99-2	Benzo(b)Fluoranthene	10000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	10000.0 U.
13	50-32-8	Benzo(a)Pyrene	10000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	10000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	10000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	10000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/17/93

SAMPLE ID: S-16

LAB ID: 1765116

DIL FACTOR: 2.00

% MOISTURE: 20

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	1000.0 U.
2	208-96-8	Acenaphthylene	1000.0 U.
3	83-32-9	Acenaphthene	180.0 J.
4	86-73-7	Fluorene	150.0 J.
5	85-01-8	Phenanthrene	1800.0
6	120-12-7	Anthracene	310.0 J.
7	206-44-0	Fluoranthene	1900.0
8	129-00-0	Pyrene	4200.0
9	56-55-3	Benzo(a)Anthracene	710.0 J.
10	218-01-9	Chrysene	1200.0
11	205-99-2	Benzo(b)Fluoranthene	650.0 J.
12	207-08-9	Benzo(k)Fluoranthene	740.0 J.
13	50-32-8	Benzo(a)Pyrene	780.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	610.0 J.
15	53-70-3	Dibenz(a,h)Anthracene	1000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	1000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/18/93

SAMPLE ID: S-16RE

LAB ID: 1765116

DIL FACTOR: 2.00

% MOISTURE: 20

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	1000.0 U.
2	208-96-8	Acenaphthylene	1000.0 U.
3	83-32-9	Acenaphthene	170.0 J.
4	86-73-7	Fluorene	140.0 J.
5	85-01-8	Phenanthrene	1700.0
6	120-12-7	Anthracene	280.0 J.
7	206-44-0	Fluoranthene	1600.0
8	129-00-0	Pyrene	3800.0
9	56-55-3	Benzo(a)Anthracene	670.0 J.
10	218-01-9	Chrysene	1200.0
11	205-99-2	Benzo(b)Fluoranthene	730.0 J.
12	207-08-9	Benzo(k)Fluoranthene	740.0 J.
13	50-32-8	Benzo(a)Pyrene	810.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	1000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	1000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	1000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/17/93

SAMPLE ID: S-17
LAB ID: 1765117
DIL FACTOR: 2.00
% MOISTURE: 25

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	1000.0 U.
2	208-96-8	Acenaphthylene	1000.0 U.
3	83-32-9	Acenaphthene	1000.0 U.
4	86-73-7	Fluorene	1000.0 U.
5	85-01-8	Phenanthrene	920.0 J.
6	120-12-7	Anthracene	130.0 J.
7	206-44-0	Fluoranthene	1300.0
8	129-00-0	Pyrene	1300.0
9	56-55-3	Benzo(a)Anthracene	340.0 J.
10	218-01-9	Chrysene	660.0 J.
11	205-99-2	Benzo(b)Fluoranthene	470.0 J.
12	207-08-9	Benzo(k)Fluoranthene	510.0 J.
13	50-32-8	Benzo(a)Pyrene	490.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	1000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	1000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	1000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-18
CONC. LEVEL:	LOW	LAB ID:	1765115
EXTRACTION DATE:	8/2/93	DIL FACTOR:	4.00
ANALYSIS DATE:	8/17/93	% MOISTURE:	23

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	1200.0 J.
2	208-96-8	Acenaphthylene	2000.0 U.
3	83-32-9	Acenaphthene	3300.0
4	86-73-7	Fluorene	3000.0
5	85-01-8	Phenanthrene	12000.0
6	120-12-7	Anthracene	3600.0
7	206-44-0	Fluoranthene	12000.0
8	129-00-0	Pyrene	24000.0 E
9	56-55-3	Benzo(a)Anthracene	5600.0
10	218-01-9	Chrysene	8200.0
11	205-99-2	Benzo(b)Fluoranthene	3900.0
12	207-08-9	Benzo(k)Fluoranthene	4300.0
13	50-32-8	Benzo(a)Pyrene	5000.0
14	193-39-5	Indeno(1,2,3-cd)Pyrene	3100.0
15	53-70-3	Dibenz(a,h)Anthracene	2000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	3000.0

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/18/93

SAMPLE ID: S-18DL
LAB ID: 1765115
DIL FACTOR: 16.00
% MOISTURE: 23

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	1300.0 DJ
2	208-96-8	Acenaphthylene	6900.0 U.
3	83-32-9	Acenaphthene	3600.0 DJ
4	86-73-7	Fluorene	3300.0 DJ
5	85-01-8	Phenanthrene	25000.0 D
6	120-12-7	Anthracene	4400.0 DJ
7	206-44-0	Fluoranthene	24000.0 D
8	129-00-0	Pyrene	15000.0 D
9	56-55-3	Benzo(a)Anthracene	5700.0 DJ
10	218-01-9	Chrysene	8400.0 D
11	205-99-2	Benzo(b)Fluoranthene	4600.0 DJ
12	207-08-9	Benzo(k)Fluoranthene	5100.0 DJ
13	50-32-8	Benzo(a)Pyrene	5300.0 DJ
14	193-39-5	Indeno(1,2,3-cd)Pyrene	6900.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	6900.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	6900.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-2
CONC. LEVEL:	LOW	LAB ID:	1765101
EXTRACTION DATE:	8/2/93	DIL FACTOR:	2.00
ANALYSIS DATE:	8/13/93	% MOISTURE:	22

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	800.0 U.
2	208-96-8	Acenaphthylene	800.0 U.
3	83-32-9	Acenaphthene	120.0 J.
4	86-73-7	Fluorene	110.0 J.
5	85-01-8	Phenanthrene	1600.0
6	120-12-7	Anthracene	190.0 J.
7	206-44-0	Fluoranthene	1700.0
8	129-00-0	Pyrene	1100.0
9	56-55-3	Benzo(a)Anthracene	380.0 J.
10	218-01-9	Chrysene	660.0 J.
11	205-99-2	Benzo(b)Fluoranthene	460.0 J.
12	207-08-9	Benzo(k)Fluoranthene	470.0 J.
13	50-32-8	Benzo(a)Pyrene	380.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	800.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	800.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	800.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/13/93

SAMPLE ID: S-3
LAB ID: 1765102
DIL FACTOR: 1.00
% MOISTURE: 19

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	400.0 U.
2	208-96-8	Acenaphthylene	400.0 U.
3	83-32-9	Acenaphthene	400.0 U.
4	86-73-7	Fluorene	400.0 U.
5	85-01-8	Phenanthrene	400.0 U.
6	120-12-7	Anthracene	400.0 U.
7	206-44-0	Fluoranthene	400.0 U.
8	129-00-0	Pyrene	400.0 U.
9	56-55-3	Benzo(a)Anthracene	400.0 U.
10	218-01-9	Chrysene	400.0 U.
11	205-99-2	Benzo(b)Fluoranthene	400.0 U.
12	207-08-9	Benzo(k)Fluoranthene	400.0 U.
13	50-32-8	Benzo(a)Pyrene	400.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	400.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	400.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	400.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL

CONC. LEVEL: LOW

EXTRACTION DATE: 8/2/93

ANALYSIS DATE: 8/16/93

SAMPLE ID: S-3RE

LAB ID: 1765102

DIL FACTOR: 1.00

% MOISTURE: 19

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	400.0 U.
2	208-96-8	Acenaphthylene	400.0 U.
3	83-32-9	Acenaphthene	400.0 U.
4	86-73-7	Fluorene	400.0 U.
5	85-01-8	Phenanthrene	400.0 U.
6	120-12-7	Anthracene	400.0 U.
7	206-44-0	Fluoranthene	400.0 U.
8	129-00-0	Pyrene	44.0 J.
9	56-55-3	Benzo(a)Anthracene	400.0 U.
10	218-01-9	Chrysene	400.0 U.
11	205-99-2	Benzo(b)Fluoranthene	400.0 U.
12	207-08-9	Benzo(k)Fluoranthene	400.0 U.
13	50-32-8	Benzo(a)Pyrene	400.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	400.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	400.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	400.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/13/93

SAMPLE ID: S-4
LAB ID: 1765120
DIL FACTOR: 20.00
% MOISTURE: 44

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	12000.0 U.
2	208-96-8	Acenaphthylene	12000.0 U.
3	83-32-9	Acenaphthene	12000.0 U.
4	86-73-7	Fluorene	12000.0 U.
5	85-01-8	Phenanthrene	1700.0 J.
6	120-12-7	Anthracene	12000.0 U.
7	206-44-0	Fluoranthene	12000.0 U.
8	129-00-0	Pyrene	1500.0 J.
9	56-55-3	Benzo(a)Anthracene	12000.0 U.
10	218-01-9	Chrysene	12000.0 U.
11	205-99-2	Benzo(b)Fluoranthene	12000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	12000.0 U.
13	50-32-8	Benzo(a)Pyrene	12000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	12000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	12000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	12000.0 U.

1B PAH
NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/16/93

SAMPLE ID: S-4RE
LAB ID: 1765120
DIL FACTOR: 20.00
% MOISTURE: 44

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	12000.0 U.
2	208-96-8	Acenaphthylene	12000.0 U.
3	83-32-9	Acenaphthene	12000.0 U.
4	86-73-7	Fluorene	12000.0 U.
5	85-01-8	Phenanthrene	1500.0 J.
6	120-12-7	Anthracene	12000.0 U.
7	206-44-0	Fluoranthene	12000.0 U.
8	129-00-0	Pyrene	12000.0 U.
9	56-55-3	Benzo(a)Anthracene	12000.0 U.
10	218-01-9	Chrysene	12000.0 U.
11	205-99-2	Benzo(b)Fluoranthene	12000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	12000.0 U.
13	50-32-8	Benzo(a)Pyrene	12000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	12000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	12000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	12000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX: SOIL
CONC. LEVEL: LOW
EXTRACTION DATE: 8/2/93
ANALYSIS DATE: 8/13/93

SAMPLE ID: S-5
LAB ID: 1765107
DIL FACTOR: 10.00
% MOISTURE: 34

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	5000.0 U.
2	208-96-8	Acenaphthylene	5000.0 U.
3	83-32-9	Acenaphthene	5000.0 U.
4	86-73-7	Fluorene	5000.0 U.
5	85-01-8	Phenanthrene	5000.0 U.
6	120-12-7	Anthracene	5000.0 U.
7	206-44-0	Fluoranthene	5000.0 U.
8	129-00-0	Pyrene	890.0 J.
9	56-55-3	Benzo(a)Anthracene	5000.0 U.
10	218-01-9	Chrysene	4800.0 J.
11	205-99-2	Benzo(b)Fluoranthene	5000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	5000.0 U.
13	50-32-8	Benzo(a)Pyrene	5000.0 U.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	5000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	5000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	5000.0 U.

1B PAH

NYTEST ENVIRONMENTAL INC.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	S-5RE
CONC. LEVEL:	LOW	LAB ID:	1765107
EXTRACTION DATE:	8/2/93	DIL FACTOR:	10.00
ANALYSIS DATE:	8/17/93	% MOISTURE:	34

CMPD #	CAS Number	PAH COMPOUNDS	UG/KG (DRY BASIS)
1	91-20-3	Naphthalene	5000.0 U.
2	208-96-8	Acenaphthylene	5000.0 U.
3	83-32-9	Acenaphthene	5000.0 U.
4	86-73-7	Fluorene	5000.0 U.
5	85-01-8	Phenanthrene	5000.0 U.
6	120-12-7	Anthracene	5000.0 U.
7	206-44-0	Fluoranthene	820.0 J.
8	129-00-0	Pyrene	630.0 J.
9	56-55-3	Benzo(a)Anthracene	5000.0 U.
10	218-01-9	Chrysene	2800.0 J.
11	205-99-2	Benzo(b)Fluoranthene	5000.0 U.
12	207-08-9	Benzo(k)Fluoranthene	5000.0 U.
13	50-32-8	Benzo(a)Pyrene	1700.0 J.
14	193-39-5	Indeno(1,2,3-cd)Pyrene	5000.0 U.
15	53-70-3	Dibenz(a,h)Anthracene	5000.0 U.
16	191-24-2	Benzo(g,h,i)Perylene	5000.0 U.