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Winston-Salem
Regional Office

Sun Company, Inc.
4041 Market Street
Aston PA 19014
215 499 5770



July 28, 1993

Ms. Sherri V. Knight
NCDEHNR
DEM - Groundwater Section
Winston-Salem Regional Office
8025 North Point Boulevard
Winston-Salem, North Carolina 27106

Re: Former Elm Street Sunoco Station #0275-7516
2903 S. Elm Street
Greensboro, North Carolina

Dear Ms. Knight:

Enclosed please find the Comprehensive Site Assessment report prepared for the above referenced site. Based on the results of the CSA report, preparation of a Corrective Action Plan has not been initiated at this time.

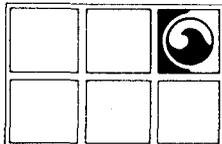
Please feel free to call if you have any questions regarding this report.

Sincerely,
SUN COMPANY, INC.

Daniel P. Shine
Environmental Engineer

Enclosures





**GROUNDWATER
TECHNOLOGY**

Groundwater Technology, Inc.

1000 Perimeter Park Drive, Suite #1, Morrisville, NC 27560

COMPREHENSIVE SITE ASSESSMENT

Sunoco Station #0275-7516
2903 S. Elm Street
Greensboro, North Carolina

July 20, 1993

Prepared for:
Mr. Daniel Shine
SUN COMPANY, INC.
4041 Market Street
Aston, PA 19014

Prepared by:
GROUNDWATER TECHNOLOGY, INC.
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Reviewed by:


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N.C. Registration #1005
GeoSolutions, Inc.

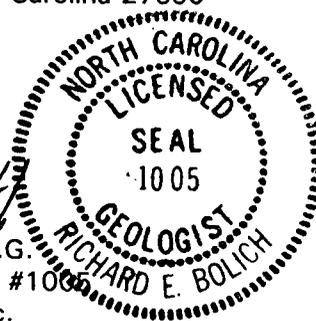


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1.0 INTRODUCTION

At the request of Mid-State Oil Company/Sun Company, Groundwater Technology, Inc. conducted an environmental site assessment at the former Sunoco station #0275-7516 located at 2903 S. Elm Street in Greensboro, North Carolina. The purpose of this investigation was to assess the quality of soils and groundwater at the site and to delineate the extent of petroleum hydrocarbons in the subsurface.

The assessment was designed to meet North Carolina Department of Environment, Health and Natural Resources (NCDEHNR) requirements for a Comprehensive Site Assessment. Specifically, the investigative activities included the installation of three Type II groundwater monitoring wells and one Type III groundwater monitoring well, soil and groundwater sampling, and drill cutting material characterization. This report presents the compilation and interpretation of the information acquired as a result of the investigation performed during June 1993.

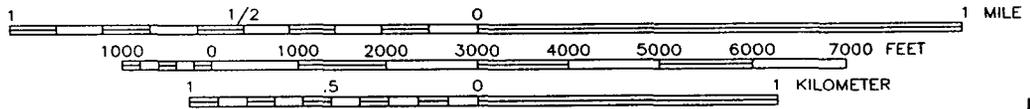
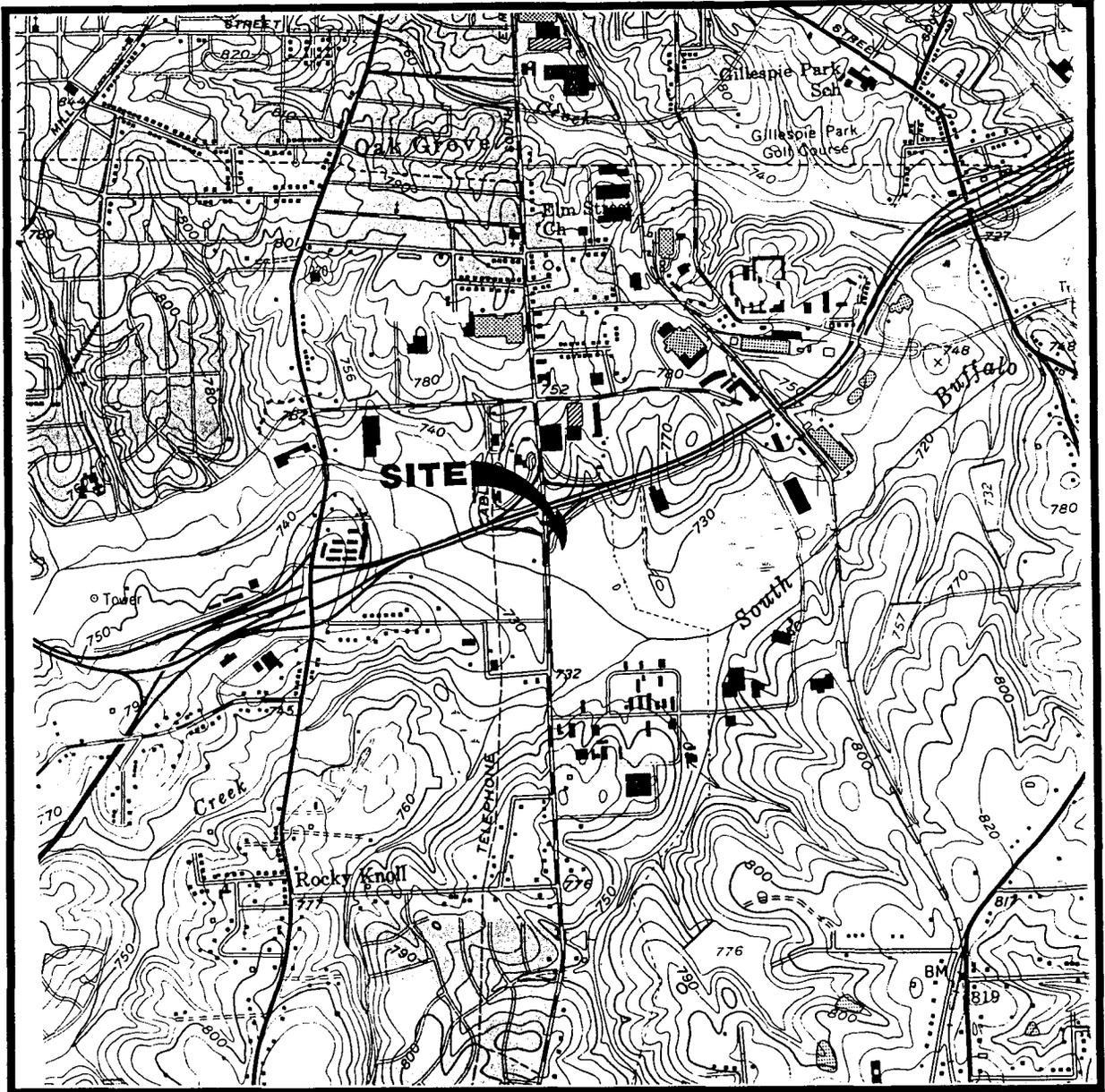
2.0 SITE INFORMATION REVIEW

2.1 Site History

During initial site assessment activities conducted by Law Engineering in December 1992, petroleum hydrocarbons were found to be present in the subsurface at the subject site. On December 2, 1992, the Winston-Salem Regional Office of the NCDEHNR received confirmation of a release associated with the underground storage tank (UST) system at the subject site and a Notice of Regulatory Requirements (NORR) was issued. The work scope of the initial assessment conducted at the site included a sensitive receptor survey, the drilling of five soil borings and collection of soil samples, the installation of one Type II groundwater monitoring well (MW-1; identified as MW-2 in the initial assessment report), and the collection of a groundwater sample and laboratory analysis. The completed site assessment report (Divestment Contamination Report: March 8, 1993) indicated that total petroleum hydrocarbons (TPH) as diesel fuel were detected above the NCDEHNR standard in soil samples collected from three of the borings. Laboratory results of a groundwater sample collected from MW-1 indicated that benzene was detected at a concentration of 13 parts per billion (ppb). Subsequent to the receipt of these reports, the Division of Environmental Management (DEM) - Winston-Salem Regional Office issued a Notice of Violation (NOV) dated April 5, 1993.

2.2 Facility Description

Former Sunoco facility #0275-7516 is located just south of the Elm Street exit off Interstate 85/40 and can be accessed from either S. Elm Street or Seneca Road (Figure 1). The subject site is no longer operating as a retail petroleum station. On-site structures consist of a station building with three service bays and a canopy covering two pump islands. The remainder of the property consists of an asphalt parking area at the front (west side) of the building with grassed areas along the back (east side) and each end of the building. The retail gasoline distribution system consists of five USTs, eight dispensing pumps, and associated underground product lines. The UST system reportedly consists of one 1,000-gallon used oil UST, three 6,000-gallon gasoline USTs, and one 4,000 to 6,000-gallon diesel UST (actual capacity is unknown). Groundwater Technology personnel also identified an area at the back of the building where it appeared that a former 1,000-



QUADRANGLE LOCATION

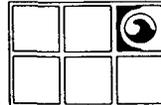
FIGURE 1 SITE LOCATION MAP SUN COMPANY, INC.

2903 S. ELM ST.
GREENSBORO, NC
053245455



GREENSBORO, NC

7.5' QUADRANGLE
36079-A7-TF-024
1968



GROUNDWATER
TECHNOLOGY, INC.

A-27-93

gallon fuel oil UST had been removed. According to the Law report, the drains from the three service bays are thought to be connected to the sanitary sewer system.

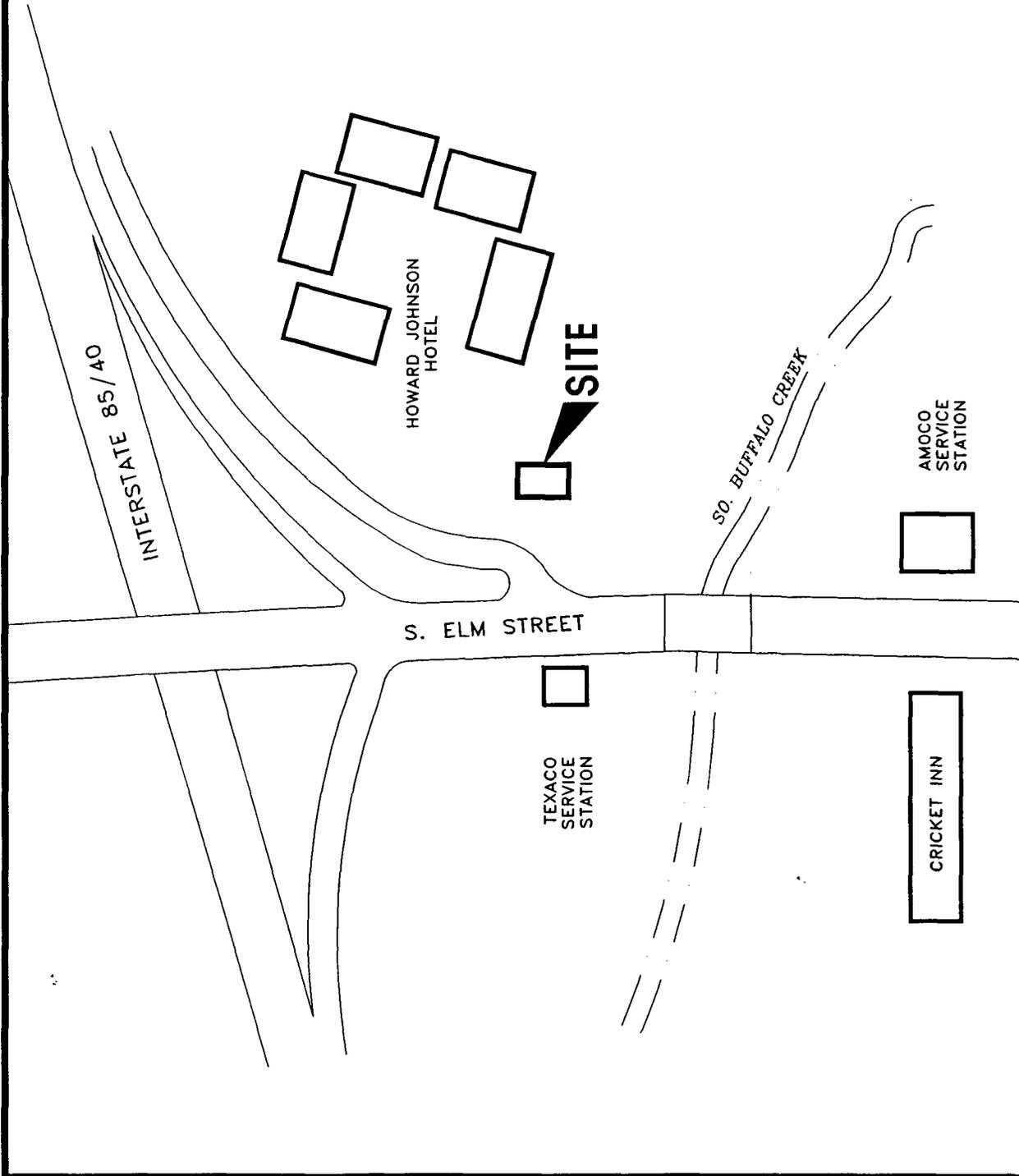
2.3 Site Location and Surrounding Properties

Land use in the vicinity of the site consists primarily of commercial businesses. A Texaco retail facility is located approximately 200 feet west of the site, across S. Elm Street, and a Cricket Inn motel is located southwest of the site, also across S. Elm Street. An Amoco retail facility is located approximately 500 feet south of the site, on the opposite side of South Buffalo Creek. A Howard Johnson hotel is located to the east-northeast of the site, and I-85/40 is located approximately 400 feet north of the site (Figure 2). According to Law Engineering's report, evidence of USTs on surrounding properties was observed at the Texaco retail facility west of the site and the Amoco retail facility south of the site. Review of the NCDEHNR Pollution Incident Report (dated 10/6/92) by Law Engineering identified several facilities in the vicinity of the site as having a documented contamination incident. The only facility identified on this list that is located within a 1,000 foot radius of the site was the Amoco retail station. The remaining identified sites appear to be located to the north, across I-85/40.

Surface drainage in the area is consistent with the topography of the site and flows in a southern direction toward South Buffalo Creek, which is located approximately 250 feet south of the site. South Buffalo Creek merges with North Buffalo Creek into Reedy Creek which eventually empties into the Haw River.

2.4 Potential Receptors

In general, phase-separated and soil-adsorbed hydrocarbons are likely to be confined to the area surrounding or immediately downgradient from the contaminant source area. Because the site is paved around the tank field and pump islands, direct contact with phase-separated, or soil-adsorbed hydrocarbons is unlikely. Moreover, potential migration of dissolved-phase hydrocarbons is restricted to subsurface migration routes. Vapor-phase hydrocarbons have the potential to migrate more readily than phase-separated or dissolved-phase hydrocarbons. The greatest risk of exposure to vapor-phase hydrocarbons is generally through basements, during excavations, or along underground utility lines.



■ NOT TO SCALE ■


 1000 PERMETER PARK DR
 SUITE 1
 MORRISVILLE, NC 27560
 (919) 467-2227

REV. NO.:
 DRAWING DATE: 7/9/93
 ACAD FILE: 5455-ore

AREA MAP

CLIENT: SUN COMPANY, INC.

LOCATION: 2903 S. ELM ST.
 GREENSBORO, NC

DESIGNED: TLW
 DETAILED: FKP
 PROJECT NO.: 053245455

PE/RC:
 FIGURE: **2**

Potential man-made migration routes for subsurface petroleum hydrocarbons at the site include underground utilities that run along Elm Street and Seneca Road. Drinking water in the vicinity of the site is provided by the City of Greensboro which obtains its water supply from reservoirs located in Guilford County. No municipal or private potable water wells were identified in the vicinity of the site. In addition, no building structures with basements were identified within a 1,500 foot radius of the site. As previously stated, Buffalo Creek is located approximately 250 feet south of the site.

3.0 INVESTIGATIVE METHODS

The following presents a summary of the investigative activities completed at the site during June 1993. Detailed descriptions of the field methodologies used for each investigative activity are presented in Appendix A.

3.1 Monitoring Well Installation and Soil Sampling

A total of four groundwater monitoring wells were installed at the site on June 1st and 2nd, 1993 to supplement the existing Type II monitoring well designated MW-1. Three of the additional wells (MW-2 through MW-4) were constructed as shallow, Type II monitoring wells to assess the lateral extent of petroleum hydrocarbons in the subsurface at the site. The fourth additional well (VMW-5) was constructed as a Type III vertical-definition well installed to assess the vertical extent of the dissolved hydrocarbon plume. The monitoring well locations and corresponding designations are shown on the site map (Figure 3).

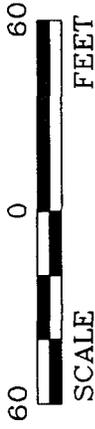
The additional groundwater monitoring wells were installed and constructed in accordance with the corresponding protocols for Type II and Type III monitoring wells presented in Appendix A. Monitoring well construction details for the newly installed wells are presented in the well construction records and drilling logs included in Appendix B. A summary of well construction details for all existing wells at the site are presented below in Table 1.

Table 1
Monitoring Well Construction

Well Designation	Total Depth (feet)	Screened Interval (feet)	Casing Diameter	Well Type
MW-1	25	10-25	4"	Type II
MW-2	30	5-30	4"	Type II
MW-3	25	5-25	4"	Type II
MW-4	25	5-25	4"	Type II
VMW-5	48	43-48	2"	Type III

LEGEND

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- FH FIRE HYDRANT



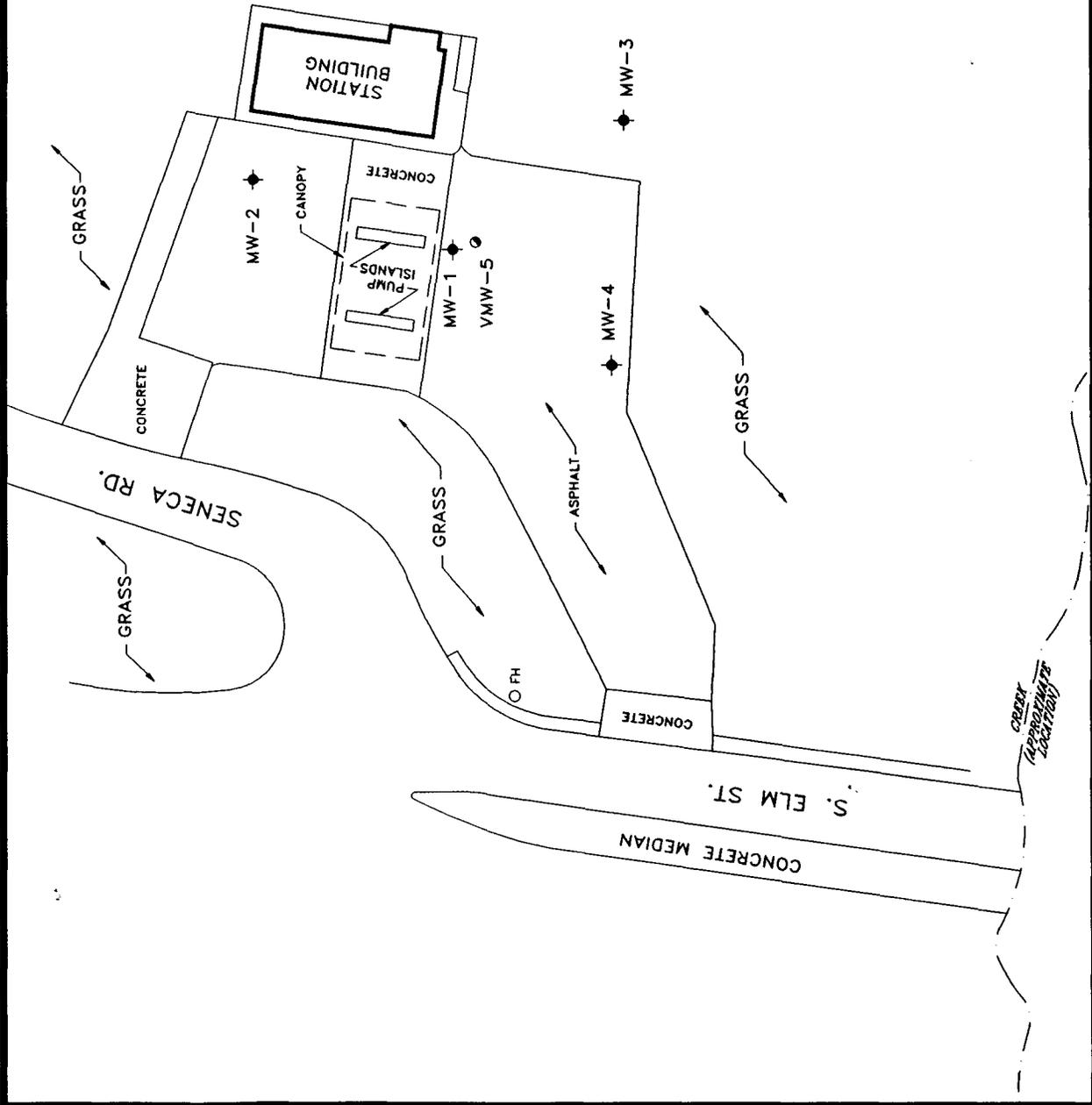
SOURCE: JAMES L. HAINES & ASSOC. - 6/16/93 SURVEY


GROUNDWATER TECHNOLOGY
 1000 PERIMETER PARK DR
 SUITE 1
 MORRISVILLE, NC 27560
 (919) 467-2227

REV. NO.:
 DRAWING DATE: 6/30/93
 ACAD FILE: 5455-SIT

SITE MAP

CLIENT:	SUN COMPANY, INC.	PM:	
LOCATION:	2903 S. ELM ST. GREENSBORO, NC	PE/RC:	
DESIGNED:	TLW FKP	PROJECT NO.:	053245455
		FIGURE:	3



*CHERRY
APPROXIMATE
2003/1/17/04*

During installation of the Type II and Type III monitoring wells, soil samples were collected from each well boring according to the soil sampling protocol included in Appendix A. The material collected in each split-spoon sampler was retained for screening and a description of the material was logged by a geologist. Each soil sample collected was screened with a photoionization detector (PID) to provide a preliminary indication of the presence of volatile organic compounds (VOCs). The soil sample collected from just above the water table at each well location that exhibited the highest PID response was retained and submitted for laboratory analysis of TPH as gasoline and diesel fuel by California GC Method SW-846 (modified EPA Method 8015) using Methods 5030 and 3550 for extraction.

Subsequent to installation, the monitoring wells were developed and surveyed according to the corresponding protocols included in Appendix A. A copy of the original well-head elevation survey is included as Appendix C.

3.2 Groundwater Sampling and Well Gauging

Prior to the collection of groundwater samples on June 15, 1993, all monitoring wells were gauged using an electronic optical Interface Probe™ to determine the depth to water and the presence/absence of phase-separated hydrocarbons (PSH). Groundwater samples were then collected from the existing and newly installed monitoring wells (5 total) and submitted for laboratory analysis of purgeable halocarbons by EPA Method 601, purgeable aromatics plus methyl tertiary-butyl ether (MTBE) and isopropyl ether (IPE) by modified EPA Method 602, ethylene dibromide (EDB) by EPA Method 504, and semivolatile organics (base/neutrals) by EPA Method 625 in accordance with NCDEHNR guidelines. The field protocols used for well gauging and groundwater sampling are presented in Appendix A.

3.3 Drill Cutting Material Classification

Drill cuttings generated during drilling operations were stockpiled on site for subsequent characterization and determination of disposal or on-site treatment options. The drill cuttings were placed on and covered with polyethylene sheeting for temporary on-site staging in accordance with NCDEHNR guidelines. A composite sample (CS-1) was obtained from the stockpiled soils and submitted for the following laboratory analyses to determine if the material should be classified as

hazardous or non-hazardous in accordance with the petroleum UST exclusion clause of the RCRA Toxicity Characteristic (TC) Rule:

- TCLP metals; and
- Reactivity, Corrosivity, and Ignitability.

Based on our experience at similar sites, it was anticipated that the excavated material would be suitable for reclamation at a state-approved brick manufacturing facility. Therefore, the composite sample was also analyzed for the following parameters to meet the analytical requirements of the brick manufacturer:

- BTEX by EPA Method 8020;
- TPH by EPA Methods 3550 and 5030; and
- Total Organic Halogens (TOX) by EPA Method 9020.

4.0 RESULTS

4.1 Site Geology

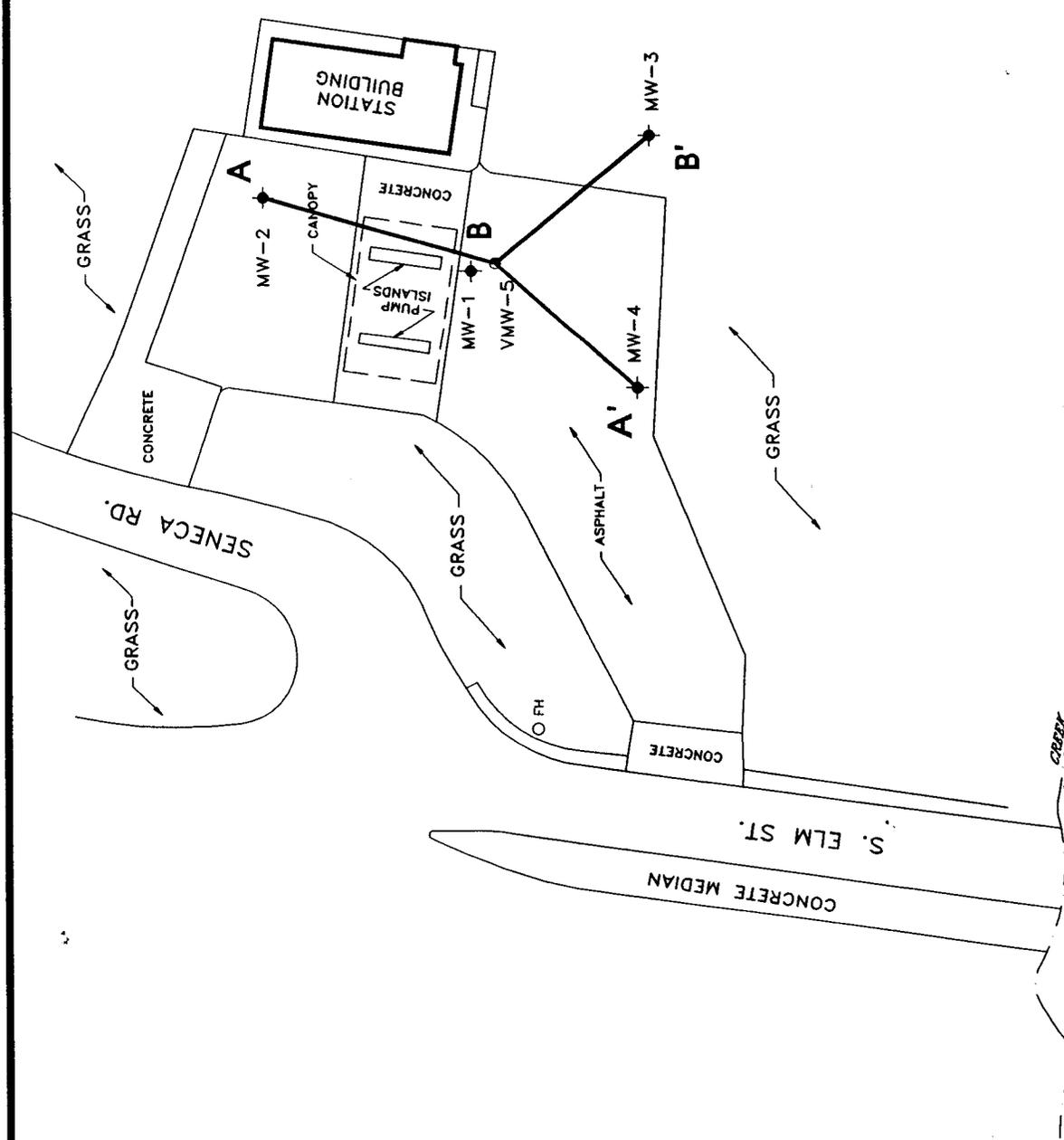
The subject site is located in the Charlotte and Milton Belts of the Piedmont Physiographic Province of central North Carolina. This portion of the Piedmont is characterized by igneous to meta-igneous rock with two dominant groups of intrusions: the diorite-gabbro group and the granitic plutons. The Charlotte belt consists of rocks of a higher metamorphic grade sandwiched between lower grade rocks of the Kings Mountain belt and Carolina Slate belt. The Milton belt, formerly the northern part of the Charlotte belt, consists of strongly foliated gneiss and schist. The city of Greensboro is underlain by predominantly medium to coarse-grained, equigranular to porphyritic quartz monzonite and granodiorite with lesser amounts of granite, tonalite and quartz diorite. The rock is massive to well-foliated with common shearing and recrystallization. The rocks of the Piedmont are, for the most part, metamorphosed and deeply weathered.

To date, five groundwater monitoring wells have been installed at the site. The soils encountered during drilling activities are characterized as sandy clay changing to silty clay at approximately 16 to 20 feet below grade, with saprolite (clayey sand) encountered at 25 to 35 feet below grade.

Two geologic cross sections have been prepared based on the monitoring well drill logs. The lines of cross section, A-A' and B-B', are indicated in Figure 4. Cross section A-A' is oriented in a north-south direction and is presented as Figure 5. Cross section B-B' is oriented in an east-west direction and is presented as Figure 6.

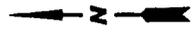
4.2 Site Hydrogeology

During drilling operations, visibly saturated soils were encountered at depths ranging from 12 to 16 feet below grade. Subsequent to completion of the wells, the static water table stabilized at depths ranging between 11.9 and 15.2 feet below grade. Shallow groundwater at the site occurs under water-table (unconfined) conditions within the interstitial pore space of the unconsolidated materials.



LEGEND

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- FH FIRE HYDRANT



SOURCE: JAMES L. HANES & ASSOC. - 6/16/93 SURVEY

GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR
SUITE 1
MORRISVILLE, NC 27560
(919) 487-2227

REV. NO.: DRAWING DATE: 6/30/93 ACAD FILE: 5455-SIT

LINES OF GEOLOGIC CROSS-SECTION A-A' & B-B'

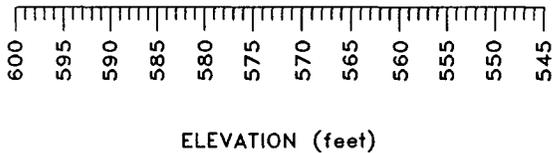
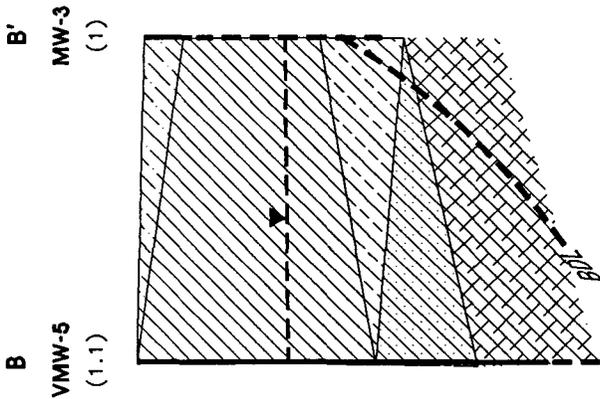
CLIENT: SUN COMPANY, INC. PM:

LOCATION: 2903 S. ELM ST. GREENSBORO, NC PE/RC:

DESIGNED: TLW PROJECT NO.: 053245455

Detailed: FKP FIGURE: 4

CHECK APPROPRIATE LOCATION



VERTICAL SCALE AS SHOWN
 40 0 40
 HORIZONTAL SCALE IN FEET

LEGEND

-  SANDY CLAY
-  SAPROLITE
-  SILTY SANDY CLAY
-  CLAYEY SAND
-  SILTY CLAY
- (13) DISSOLVED TOTAL BTEX CONCENTRATION (ppb) IN GROUNDWATER, JUNE 15, 1993
-  WATER-TABLE ELEVATION (feet)
-  DISSOLVED TOTAL BTEX CONTOUR (ppb)
- BDL BELOW DETECTION LIMIT

SOURCE: WELL LOG INFORMATION

1000 PERIMETER PARK DR
 SUITE 1
 MORRISVILLE, NC 27560
 (919) 467-2227
 GROUNDWATER TECHNOLOGY

REV. NO.: DRAWING DATE: 6/28/93
 ACAD FILE: 5455-XBB

GEOLOGIC CROSS-SECTION B-B'

CLIENT: SUN COMPANY, INC. PM:
 LOCATION: 2903 S. ELM ST. GREENSBORO, NC PE/RC:
 DESIGNED: TLW FKP PROJECT NO.: 053245455
 FIGURE: **6**

The liquid level data collected from the June 15, 1993 monitoring well gauging event are presented in Table 2. Based on this data, a water-table elevation contour map was developed and is presented as Figure 7. Phase-separated hydrocarbons were not detected in any of the wells during this gauging event.

Table 2
Water-Table Elevations (ft)
June 15, 1993

Well	Depth to Water ₁	Well-head Elevation ₂	Water-Table Elevation
MW-1	15.14	597.04	581.90
MW-2	11.93	596.61	584.68
MW-3	14.67	596.36	581.69
MW-4	13.92	596.47	582.55
VMW-5	14.82	597.10	582.25

₁Depth to water measured relative to top of casing.

₂Well-head elevations relative to site-specific datum.

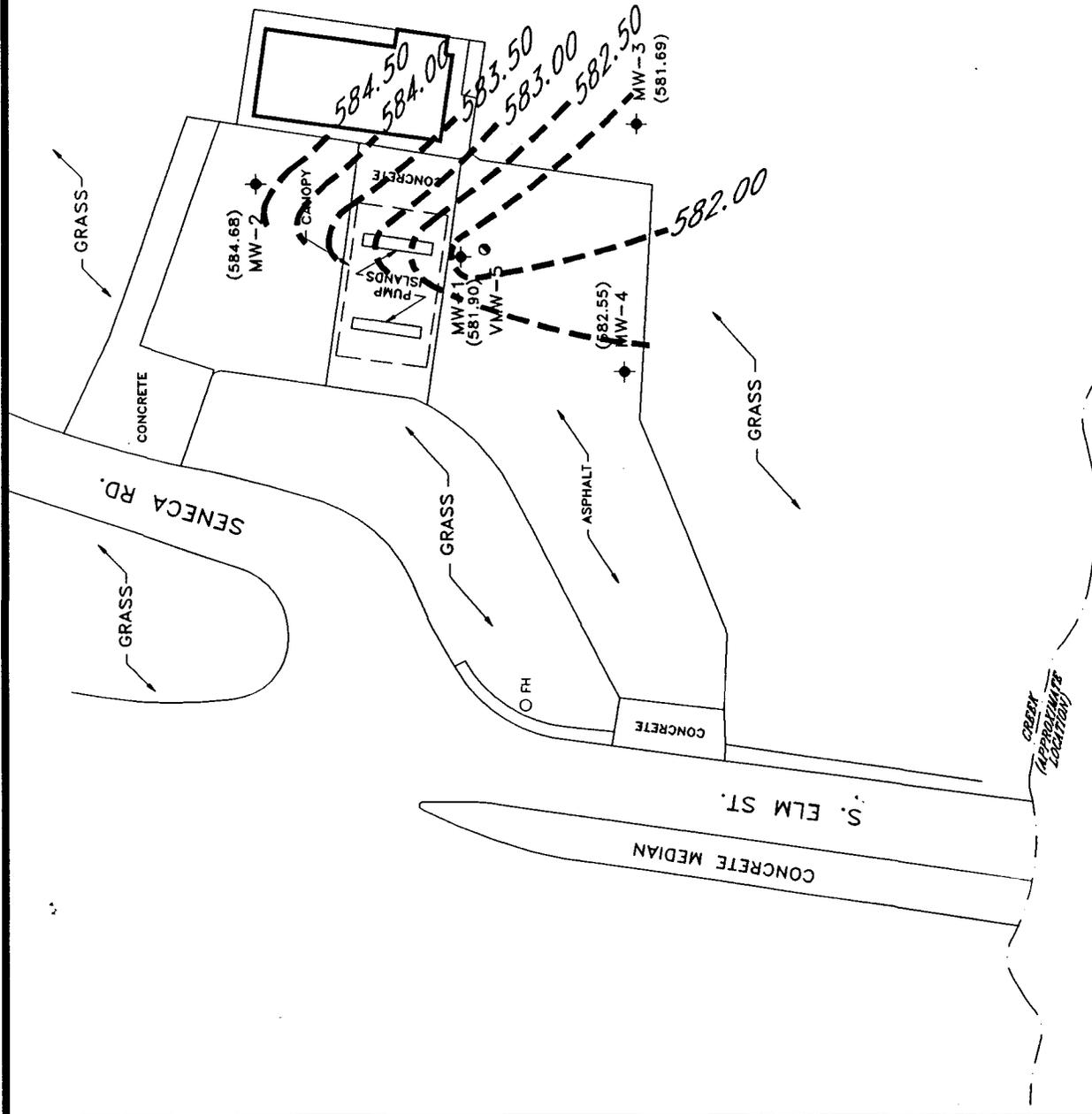
The water-table elevation contours indicate that the major component of shallow groundwater flow beneath the site appears to be toward the southeast. It should be noted that because well VMW-5 is constructed as a vertical-definition well with a screened interval extending from 43 to 48 feet below grade, it was not used to determine the shallow water-table configuration.

4.3 Laboratory Analytical Results

The results of assessment activities indicate that petroleum hydrocarbons are present in the groundwater at the site. The following sections address the laboratory results for soil and groundwater samples obtained from the site.

4.3.1 Soil Analytical Results

During installation of wells MW-2 through MW-4 and VMW-5, soil samples were collected with split-spoon sampling devices and screened in the field for the presence of VOCs with a PID. Table 3 presents a summary of PID readings and corresponding laboratory results obtained from the soil samples collected during the installation of the monitoring wells.



LEGEND

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- FH FIRE HYDRANT
- (584.68) WATER-TABLE ELEVATION (feet)
- 582 --- WATER-TABLE ELEVATION CONTOUR (feet)



SOURCE: JAMES L. HAINES & ASSOC. - 6/16/93 SURVEY


GROUNDWATER TECHNOLOGY
 1000 PERIMETER PARK DR
 SUITE 1
 MORRISVILLE, NC 27560
 (919) 467-2227

REV. NO.: DRAWING DATE: 6/30/93 ACAD FILE: 5455-693

WATER-TABLE ELEVATION CONTOUR MAP
JUNE 18, 1993

CLIENT:	SUN COMPANY, INC.	PM:	
LOCATION:	2903 S. ELM ST. GREENSBORO, NC	PE/RC:	
DESIGNED:	TLW	PROJECT NO.:	053245455
Detailed:	FKP	FIGURE:	7

Table 3
Soil Samples Summary and Laboratory Analytical Results
June 1 and 2, 1993

Sample Location	Sample Depth (feet)	PID Response (Unitless)	TPH as Gasoline (ppm)	TPH as Diesel (ppm)
MW-2	12-14	21	1.0	<10
MW-3	14-16	13	<1.0	<10
MW-4	12-14	89	<1.0	28
VMW-5	12-14	6	<1.0	<10

Analytical results of the soil sample collected from the installation of well MW-4 indicate that TPH as diesel fuel were detected at a concentration of 28 parts per million (ppm); above the method detection limit, but below the NCDEHNR standard of 40 ppm. TPH as gasoline were not detected above the method detection limit in well MW-4. Laboratory results from the soil samples collected from wells MW-2, MW-3 and VMW-5 did not indicate concentrations of TPH as gasoline or diesel fuel above the corresponding NCDEHNR standards. Copies of the original soil analytical reports are included in Appendix D.

4.3.2 Drill Cutting Material Characterization Analytical Results

Laboratory results indicate that the composite sample of the drill cuttings did not exhibit characteristics of ignitability, reactivity or corrosivity. In addition, the laboratory results for RCRA metals analysis by TCLP indicate that none of the metals were detected above the corresponding maximum allowable TCLP concentration limit in any of the leachates. Based on the laboratory analytical data, the drill cuttings should be classified as a non-hazardous material, and it is anticipated that they will be disposed of at a state-approved brick manufacturing facility. Copies of the original laboratory reports are presented in Appendix E.

4.3.3 Groundwater Analytical Results

A summary of the laboratory analytical results for groundwater samples collected from the five monitoring wells at the site are presented below in Table 4. The corresponding NCDEHNR water quality standards are also presented for comparison. Copies of the original laboratory reports are included in Appendix F.

Table 4.1
Groundwater Analytical Results (ppb)
June 15, 1993

30' deep screen 5'-30'
30' deep screen 5'-30'
25' deep screen 5'-25'
25' deep screen 5'-25'
48' deep screen 43'-48'

Analyte	MW-1	MW-2	MW-3	MW-4	VMW-5	NCDEHNR ₁
Benzene	5	BDL	BDL	BDL	0.3	1.0
Toluene	8	BDL	1	BDL	0.3	1,000
Ethylbenzene	BDL	BDL	BDL	BDL	BDL	29
Total Xylenes	BDL	BDL	BDL	BDL	0.5	400
Total BTEX	13	BDL	1	BDL	1.1	N/A
MTBE	230	290	5	BDL	5	200
EDB	BDL	BDL	BDL	BDL	BDL	5X10 ⁻⁴
IPE	13	BDL	BDL*	BDL	BDL	NL ₂
Naphthalene	BDL	BDL	19	BDL	BDL	NL
Chloroform	BDL	BDL	BDL	BDL	11	0.19

BDL = Below Detection Limits.

Only those analytes detected above the method detection limit have been reported.

₁NCDEHNR Standard = NCDEHNR water quality standard (ppb).

₂NL = No established standard listed by the NCDEHNR.

* = Detection limit raised due to interference from non-target compound.

Shaded area indicates concentration exceeding the NCDEHNR standard/NL.

The laboratory analytical results summarized above indicate that dissolved benzene above the NCDEHNR water quality standard was only detected in the groundwater sample collected from well MW-1 at 5 ppb. Dissolved benzene was not detected above the corresponding NCDEHNR standard in the groundwater samples collected from the remaining monitoring wells.

Concentrations of total dissolved BTEX were detected in the groundwater samples from wells MW-1 (13 ppb), MW-3 (1 ppb), and VMW-5 (1.1 ppb). BTEX constituents were not detected above the corresponding method detection limits in wells MW-2 and MW-4. Site maps depicting the

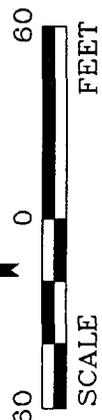
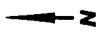
distribution of dissolved benzene and total dissolved BTEX for June 15, 1993 are included as Figures 8 and 9, respectively.

The highest concentrations of dissolved MTBE were detected in the groundwater samples from wells MW-1 (230 ppb) and MW-2 (290 ppb). Dissolved MTBE was also detected in wells MW-3 and VMW-5 at concentrations below the NCDEHNR water quality standard of 200 ppb. Dissolved MTBE was not detected in the groundwater sample from well MW-4. An isoconcentration contour map of dissolved MTBE in groundwater for June 15, 1993 is included as Figure 10.

Laboratory analytical results also indicate that IPE was detected in wells MW-1 and MW-4, and chloroform was detected in well VMW-5. In addition, one semivolatile organic compound, naphthalene, was detected in well MW-3 at a concentration of 19 ppb. None of these compounds were detected in the remaining groundwater samples. EDB was not detected at concentrations above the corresponding method detection limit in any of the groundwater samples.

LEGEND

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- FH FIRE HYDRANT
- (5) DISSOLVED BENZENE CONCENTRATION (ppb)
- BDL DISSOLVED BENZENE ISOCONCENTRATION CONTOUR (ppb)
- BDL BELOW DETECTION LIMIT



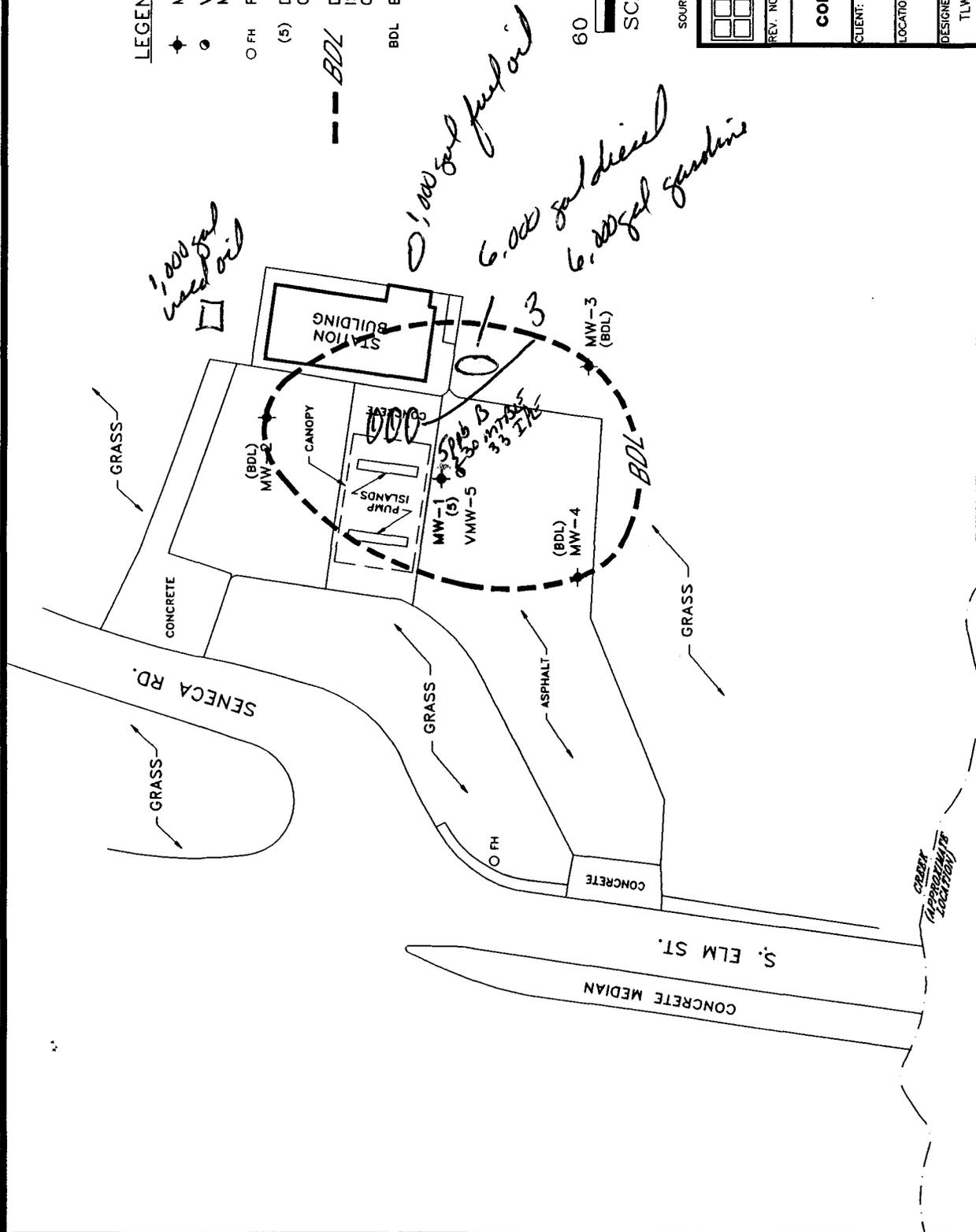
SOURCE: JAMES L. HAINES & ASSOC. - 6/16/93 SURVEY

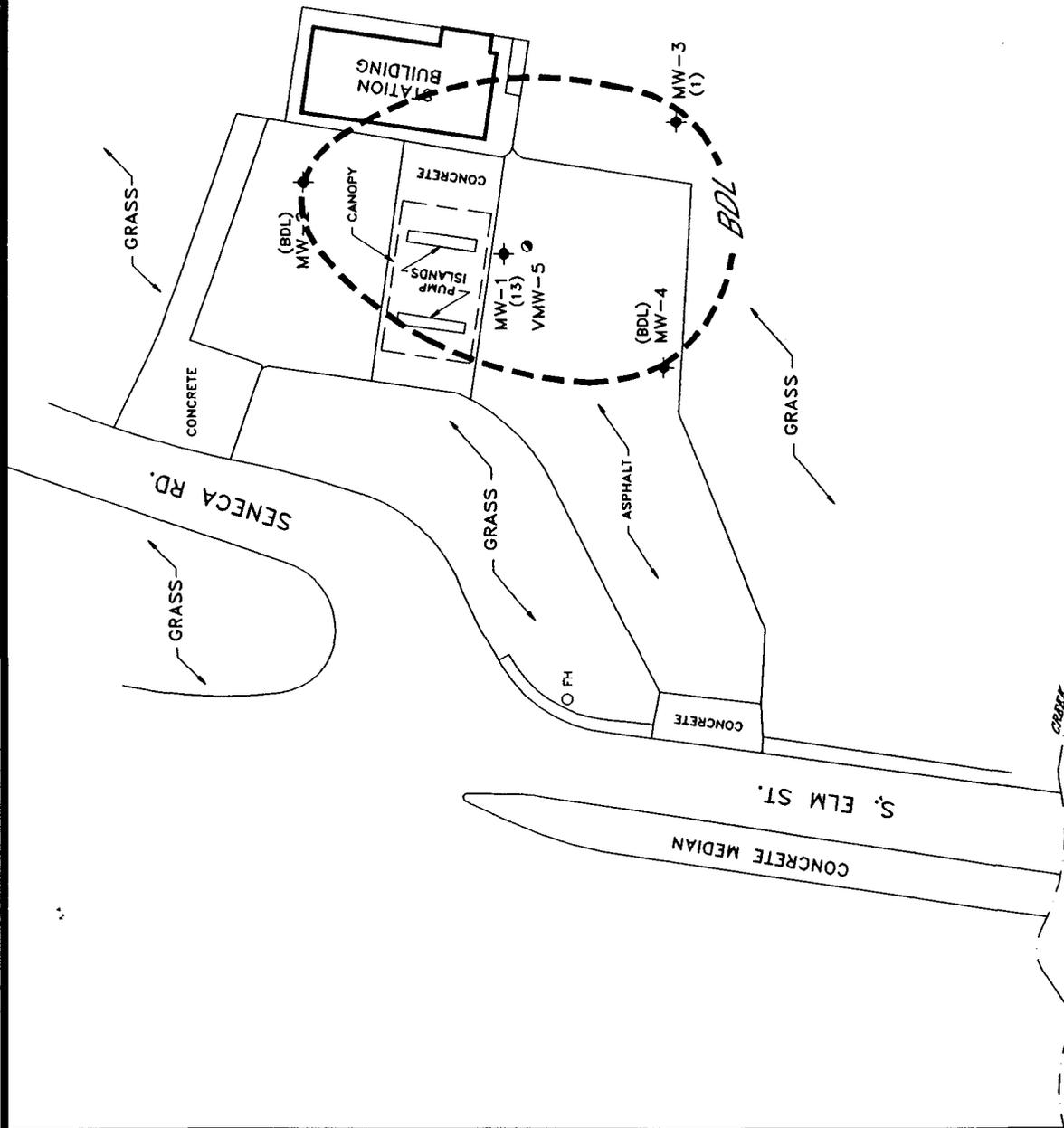
1000 PERIMETER PARK DR
SUITE 1
MORRISVILLE, NC 27560
(919) 487-2227

GROUNDWATER TECHNOLOGY

REV. NO.: DRAWING DATE: 6/30/93 ACAD FILE: 5455-693

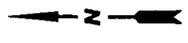
DISSOLVED BENZENE CONCENTRATION IN GROUNDWATER	
JUNE 16, 1993	
CLIENT:	SUN COMPANY, INC.
LOCATION:	2903 S. ELM ST. GREENSBORO, NC
DESIGNED:	TLW FKP
PROJECT NO.:	053245455
FIGURE:	8





LEGEND

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- FH FIRE HYDRANT
- (3) DISSOLVED TOTAL BTEX CONCENTRATION (ppb)
- BDL DISSOLVED TOTAL BTEX ISOCONCENTRATION CONTOUR (ppb)
- BDL BELOW DETECTION LIMIT



SOURCE: JAMES L. HAINES & ASSOC. - 6/16/93 SURVEY

GROUNDWATER TECHNOLOGY
1000 PERMETER PARK DR
SUITE 1
MORRISVILLE, NC 27560
(919) 487-2227

REV. NO.: DRAWING DATE: 6/30/93
ACAD FILE: 5455-693

DISSOLVED TOTAL BTEX CONCENTRATION IN GROUNDWATER
JUNE 18, 1993

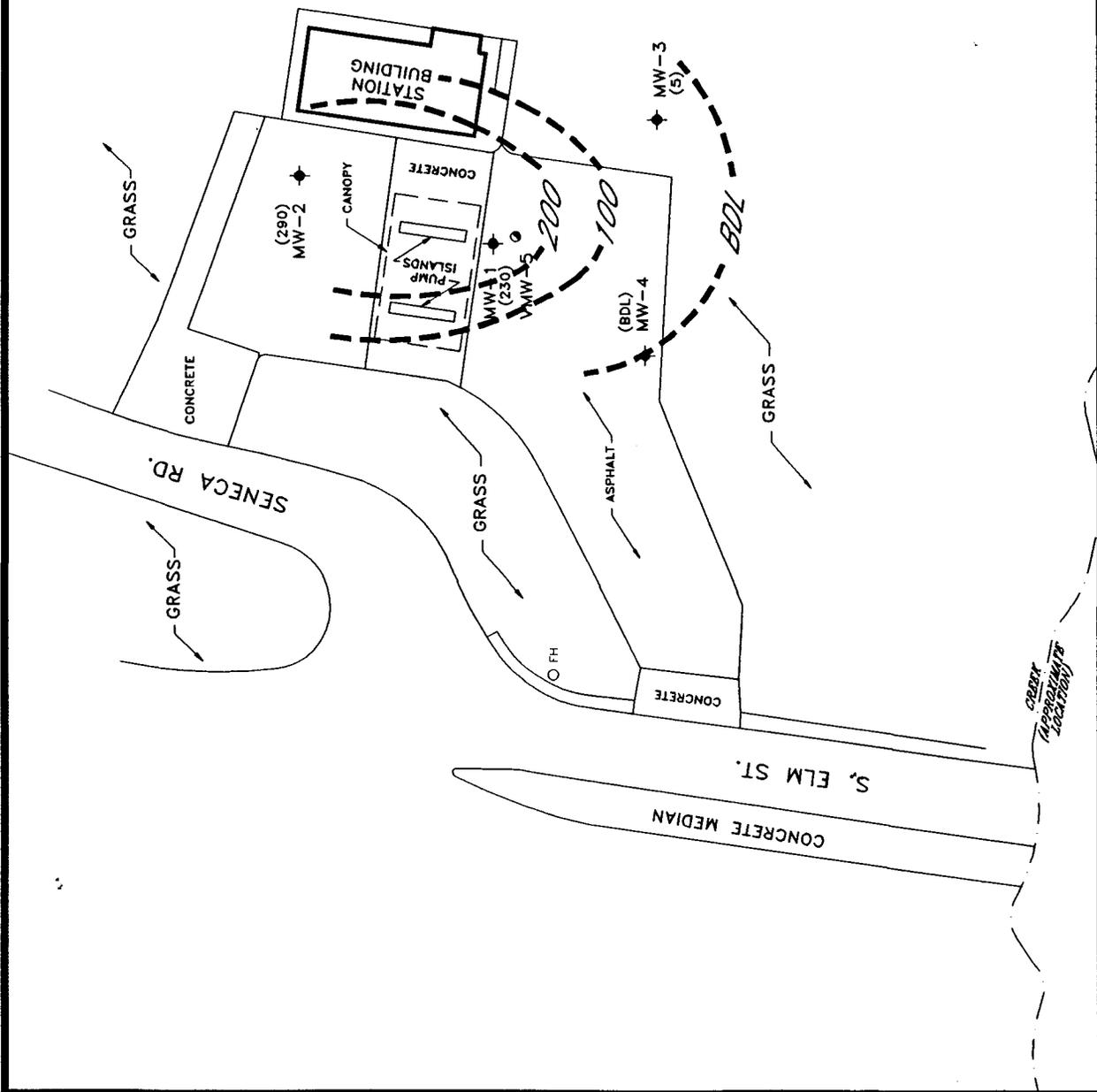
CLIENT: SUN COMPANY, INC.
PM:

LOCATION: 2903 S. ELM ST.
GREENSBORO, NC

DESIGNED: TLW
DETAILED: FKP
PROJECT NO.: 053245455

FIGURE: 9

check appropriateness of location



LEGEND

- ◆ MONITORING WELL
- VERTICAL DEFINITION MONITORING WELL
- FH FIRE HYDRANT
- (3) DISSOLVED MTBE CONCENTRATION (ppb)
- BDL
- BDL BELOW DETECTION LIMIT



SOURCE: JAMES L. HAINES & ASSOC. - 6/16/93 SURVEY

GROUNDWATER TECHNOLOGY
1000 PERIMETER PARK DR
SUITE 1
MORRISVILLE, NC 27560
(919) 467-2227

REV. NO.: DRAWING DATE: 6/30/93
ACAD FILE: 5455-693

DISSOLVED MTBE CONCENTRATION IN GROUNDWATER
JUNE 15, 1993

CLIENT: SUN COMPANY, INC. PM:

LOCATION: 2903 S. ELM ST. GREENSBORO, NC RE/RG:

DESIGNED: TLW DETAILED: FKP PROJECT NO.: 053245455

FIGURE: **10**

Check Appropriately Sectionally

5.0 INTERPRETATIONS AND CONCLUSIONS

5.1 Petroleum Hydrocarbons in Soil

Laboratory analytical results from the previous site assessment conducted by Law Engineering on December 2, 1992 and February 8, 1993 indicated that petroleum hydrocarbons were detected in soil samples collected from three of the five soil borings. TPH as diesel fuel were detected in boring sample MW-1 at 290 ppm (located adjacent to and apparently upgradient of the tank field), MW-2 at 170 ppm (located adjacent to and apparently downgradient of the pump islands), and MW-4 at 41 ppm (located at the northeast corner of the building). It should be noted that these boring designations do not correspond to the well borings recently installed (June 1 and 2, 1993).

During recent site assessment activities, soil samples were collected from the four well borings at depths of 12 to 16 feet below grade with PID readings ranging from 6 to 89. Laboratory results of soil samples collected from boring MW-4 indicated TPH as diesel fuel were detected above the method detection limit; however, the concentration did not exceed the corresponding NCDEHNR standard of 40 ppm. TPH as diesel fuel were not detected above the method detection limit in the remaining samples, and TPH as gasoline were not detected above the method detection limit in any of the samples. Therefore, based on past and present laboratory analytical data, the highest concentrations of petroleum hydrocarbons in the adsorbed phase are in the form of diesel fuel and concentrated in the vicinity of the tank field and pump islands.

5.2 Petroleum Hydrocarbons in Groundwater

Based on Groundwater Technology's interpretation of the North Carolina Classifications and Water Quality Standards (15 NCAC 2L), groundwater at the site is classified as Class GA groundwater. This classification represents groundwater that are existing or are potential sources of: 1) drinking water for humans, 2) water supply for potable mineral water and conversion to fresh waters, and/or 3) water supply for purposes other than drinking.

Laboratory analytical results from the June 15, 1993 sampling event indicate that dissolved benzene was detected above the NCDEHNR water quality standard only in the groundwater sample obtained from monitoring well MW-1 (5 ppb), downgradient of the pump islands. Dissolved

benzene was not detected above the method detection limit in wells MW-2 through MW-4. Laboratory analytical results also indicate that, with the exception of benzene in well MW-1, dissolved BTEX constituents were not detected above each of the corresponding NCDEHNR standards in the groundwater samples obtained from monitoring wells MW-2 through MW-4. Therefore, it does not appear that the lateral extent of the dissolved hydrocarbon plume extends beyond the peripheral wells (MW-2, MW-3, and MW-4) at this time, refer to Figures 8 and 9.

Dissolved MTBE was detected in the groundwater samples collected from monitoring wells MW-1 through MW-3. However, MTBE concentrations exceeding 15 NCAC 2L standards (200 ppb) were only detected in the groundwater samples obtained from wells MW-1 (230 ppb) and MW-2 (290 ppb). MTBE was not detected above the method detection limit in well MW-4. Due to the fact that MTBE is more soluble than BTEX constituents in water, it usually represents the leading edge of the hydrocarbon plume. As shown in Figure 10, the lateral extent of MTBE may be inferred hydraulically downgradient of the tank field and dispensing islands, but has not been established hydraulically upgradient as indicated by the presence of MTBE in well MW-2. The source of MTBE in this well has not been determined.

Dissolved benzene was detected in the groundwater sample collected from the vertical-definition well (VMW-5) at a concentration of 0.3 ppb, which is below the NCDEHNR water quality standard (1 ppb). Other BTEX constituents were not detected above corresponding NCDEHNR water quality standards. Based on this data, it appears that the vertical extent of dissolved BTEX constituents at the site may be inferred. Additionally, laboratory analytical results indicate that MTBE was not detected in VMW-5 above NCDEHNR action levels; therefore, the vertical extent of dissolved MTBE may also be inferred.

In addition to the above constituents, laboratory results indicated the presence of naphthalene in well MW-3 and IPE in wells MW-1 and MW-4. These two constituents would be consistent with the use of the facility for the sale of retail petroleum. The detection of chloroform in the sample from well VMW-5 is not consistent with the past or present use of the facility, therefore, the source of this compound is unknown. Due to the fact that chloroform is often used in laboratories, the presence of this compound at low concentrations in the sample from VMW-5 may possibly be due to laboratory contamination.

Currently, the State of North Carolina has published (listed) water quality standards for benzene, toluene, ethylbenzene, xylenes, MTBE and chloroform, but not for IPE or naphthalene detected in

the groundwater at the site. However, according to 15 NCAC 2L, substances which are not naturally occurring and for which no standard is specified are not permitted in detectable concentrations in Class GA groundwater.

5.3 Recommendations

Based on the minimum concentrations of petroleum hydrocarbons in excess of the corresponding NCDEHNR water quality standards at the site, Groundwater Technology recommends the initiation of quarterly groundwater monitoring and sampling activities for a one year period. At the end of the monitoring period, evaluation of contaminant levels at the site will determine whether remedial action will be necessary or if Mid-State Oil Co/Sun Company should petition for site closure.

APPENDIX A
FIELD METHODS AND PROTOCOLS

MONITORING WELL INSTALLATION AND CONSTRUCTION
Shallow (Type II) Wells Completed in Unconsolidated Material

The shallow (Type II), water-table wells were drilled with a truck-mounted drilling rig equipped with hollow-stem augers. The augers and all drilling equipment were steam cleaned prior to drilling at each location and after completion of the last boring.

Each well was installed through the augers to ensure proper construction and placement, and is constructed of Schedule 40 PVC solid casing and factory slotted well screen (0.02-inch slots) connected by threaded, flush joints. The wells were completed with a sufficient length of well screen so that the screened interval extends approximately 5 feet above and 10 feet below the static depth of the water table. The screen of each well is equipped with a PVC bottom cap. The solid PVC casing of each well extends from the top of the well screen to approximately 6-inches below grade. The annular space of each well is packed with washed sand to a minimum level of 1 foot above the top of the well screen. A one-foot-thick bentonite seal rests on top of the sand pack, above which a Portland cement grout extends to approximately 4 inches below the top of the PVC casing. The PVC casing of each well is equipped with a sealed, locking cap to prevent unauthorized access. In addition, each well casing is protected with a steel, water-tight manhole set to grade within a concrete pad. Each shallow, water-table well was constructed in accordance with NCDEHNR well construction specifications.

MONITORING WELL INSTALLATION AND CONSTRUCTION
Vertical Definition (Type III) Wells Completed in Unconsolidated Material

The deep (Type III), vertical definition well was drilled with a truck-mounted drilling rig using both hollow stem auger and rotary drilling techniques. The vertical definition well is double-cased to isolate the deep well screen from the shallow portion of the aquifer. The augers, drill pipe, and roller bit were steam cleaned prior to initiation of drilling.

To construct the deep well, hollow stem augers were advanced through the shallow portion of the water-table aquifer, and Schedule 40 PVC outer casing was placed through the augers up to grade. The inside of the outer casing was sealed at the base with a 1- to 2-foot thick cement grout seal, and the annular space surrounding the casing was filled with a cement/bentonite grout that was allowed to cure for approximately 18 to 24 hours. After the curing period, water standing in the casing was removed by pumping, and drilling was continued with a roller bit to the total depth of the well. During drilling, clean water was circulated through the roller bit to remove drill cuttings and to prevent collapse of the borehole.

The vertical definition well was installed through the outer casing, and is constructed of 2-inch ID, Schedule 40 PVC, solid casing and factory-slotted well screen (0.02-inch slots) connected by threaded, flush joints. The well was completed with 5 feet of screen equipped with a PVC bottom cap. The solid PVC casing extends from the top of the well screen to approximately 6-inches below grade. The annular space surrounding the well is packed with washed sand to a level of approximately 1 to 2 feet above the top of the well screen. A one-foot-thick bentonite seal rests on top of the sand pack, above which a cement grout extends to approximately 4 inches below the top of the PVC casing. The PVC casing is equipped with a sealed, locking cap to prevent unauthorized access. In addition, the well casing is protected with a steel, water-tight manhole set to grade within a concrete pad. The deep, vertical definition well was constructed in accordance with NCDEHNR well construction specifications.

SOIL SAMPLING PROTOCOL

During drilling operations, soil samples were collected using 2-foot-long, split-spoon samplers. The split-spoon samplers were washed with alkaline soap and water and rinsed with distilled water prior to each use. At each drilling location, soil samples were collected in 2-foot intervals at selected depths to the completion depth of drilling. The depths from which soil samples were collected at each location are indicated in the drilling logs presented in Appendix B. The split-spoon samplers were advanced using a 140-pound sliding hammer, and the number of hammer blows required to advance the split spoons in successive 6-inch increments was recorded.

A description of the soils retained in each split-spoon sampler was logged by a geologist, and representative portions of the material were placed into labeled laboratory containers that were promptly placed on ice in a cooler. A separate representative portion of each soil sample was placed in a resealable plastic bag and allowed to equilibrate for a minimum of 15 minutes. After the equilibration period, either a photoionization detector (PID) or a flame ionization detector (FID) probe was inserted into each resealable bag and a headspace reading of total volatile organic compounds (VOCs) was recorded. The PID/FID response values recorded in the field are indicated in the drilling logs presented in Appendix B. After completion of drilling at each location, the PID/FID response values for all soil samples were evaluated in the field. The soil sample from each drilling location that exhibited the highest PID/FID response value was retained and submitted for laboratory analysis along with completed chain-of-custody forms. In the event that no PID/FID response was observed for any of the soil samples collected at a drilling location, the sample collected from immediately above the water table was retained and submitted for laboratory analysis.

WELL DEVELOPMENT PROTOCOL

Following construction and installation, the monitoring wells were developed using an air lift/purge technique to remove sediment from within the well and annular gravel pack, and to ensure proper hydraulic connection between the well and surrounding aquifer material. The well development assembly consisted of a compressed-air line, equipped with an in-line oil filter, that was passed through the center of an approximately 3-foot length of solid, Schedule 40, PVC casing that was attached to the well head with a PVC slip coupling. The solid casing was fitted with a PVC, side-discharge pipe to allow water purged during development to be conveyed to a steel, 55-gallon drum for containment prior to treatment.

Prior to initiation of the development process at each well, the compressed-air line was washed with alkaline soap and water and was rinsed with distilled water. The free end of the compressed-air line was then lowered into each well below the water table, and the top of the solid casing was sealed with duct tape. Compressed air was then passed through the air line, and water within the well was lifted and purged until the discharge appeared to be free of suspended sediments or for a maximum of two hours. Following completion of development, water contained in the 55-gallon drum was pumped through a portable granular activated carbon (GAC) treatment unit equipped with an in-line sediment filter.

WELL SURVEY

Subsequent to installation, the monitoring wells were surveyed by a licensed professional surveyor for casing elevations and horizontal positions to provide control for static head measurements and delineations of groundwater flow direction. All survey measurements were made relative to a common datum such that water level measurements from all monitoring wells could be directly compared. At each well location, the elevation of the top of the PVC casing was measured to the nearest 0.01 foot. The points at which elevations were measured were permanently marked for future reference. The horizontal positions of the monitoring wells were measured to the nearest 0.1 foot relative to the locations of the common datum and/or prominent site structures. A minimum of two reference points were used to locate each well. Well survey data are included in Appendix C.

LIQUID LEVEL MONITORING

Measurements of the liquid levels in the monitoring wells were made with an electronic optical INTERFACE PROBE™ that is capable of distinguishing liquid-phase hydrocarbons from water. Liquid levels were measured to the nearest 0.01 foot from a permanently marked survey point on the top of each well casing to allow measured values to be directly compared to a common datum. Each well was allowed to equilibrate for a minimum of 15 minutes after removal of the well cap before liquid levels were measured. Measurements made in the field included depth to water, depth to liquid-phase hydrocarbons (if present), and thickness of liquid-phase hydrocarbons (if present). If the presence of liquid-phase hydrocarbons was indicated by measurements with the INTERFACE PROBE™, a clear acrylic bailer was used to obtain a groundwater sample from the well for visual confirmation. If the presence of liquid-phase hydrocarbons was visually confirmed, a bailer was used to remove the liquid-phase hydrocarbons to the fullest extent possible. Liquid-phase hydrocarbons removed from the monitoring wells were transferred to an appropriately labeled on-site storage vessel pending classification and disposal. All measured liquid level values, the approximate volume of liquid-phase hydrocarbons removed from each well (if applicable), and all pertinent field observations were immediately recorded in a bound field book to provide a permanent record of the site visit.

GROUNDWATER SAMPLING PROTOCOL

Groundwater samples were obtained from the monitoring wells using the following protocol:

- 1) The static water level in each well was measured with an electronic optical INTERFACE PROBE™.
- 2) The volume of standing water (in gallons) in each well was calculated using the following formula:

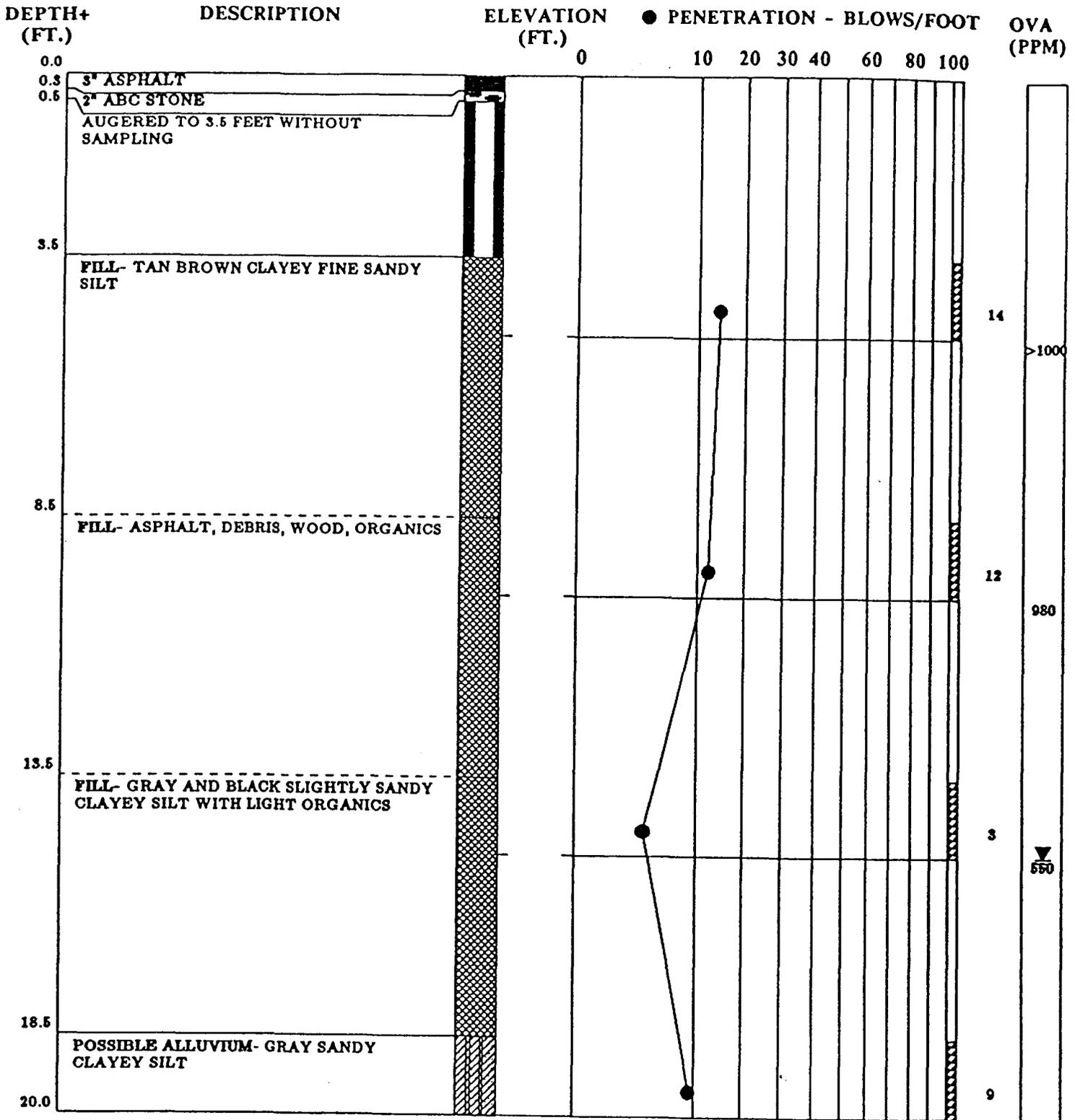
$$V = [(3.14) r^2 h] \times 7.48 \text{ gal/ft}^3$$

where r is the radius of the well in feet, and h is the height of the water column standing in the well.

- 3) Monitoring wells capable of sustaining sufficient yield were purged of a minimum of three static well volumes of water using a stainless steel submersible pump. Monitoring wells having low yield were purged until dry, and the water level was allowed to recover to a minimum of 80 percent of the static level prior to sampling. Purged water was conveyed to a steel 55-gallon drum for containment and then pumped through a portable granular activated carbon (GAC) treatment unit equipped with an in-line sediment filter prior to being discharged.
- 4) Representative groundwater samples were collected with a stainless steel bailer that was thoroughly cleaned prior to sample collection from each well using an alkaline soap and water wash followed by three distilled water rinses. The first bailer of water retrieved from each well was discarded. All groundwater samples were transferred directly from the bailer to laboratory-prepared containers.
- 5) All sample containers were labeled with the following information:
 - Sample Designation
 - Sampling Date
 - Sampling Time
 - Site Name
 - Requested Analysis/Analyses
 - Type of Preservative Used (if applicable)
- 6) All sample containers were placed on ice in a cooler, along with completed chain-of-custody forms, and shipped via overnight courier to GTEL Environmental Laboratories, Inc. for analysis.

APPENDIX B

DRILL LOGS AND WELL CONSTRUCTION RECORDS



REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-2
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 1 OF 2	
 LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

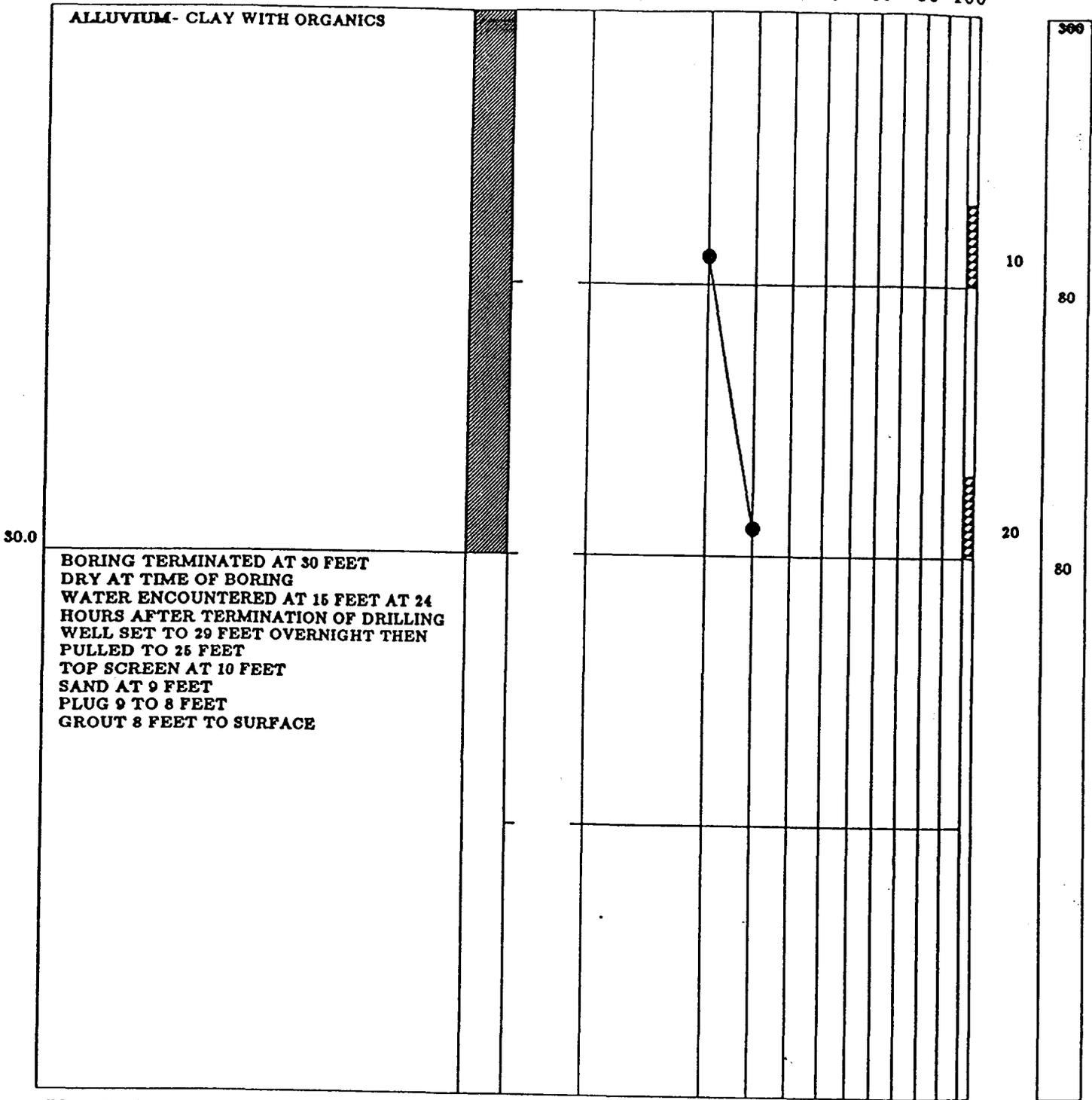
DEPTH+
(FT.)

DESCRIPTION

ELEVATION
(FT.)

● PENETRATION - BLOWS/FOOT
0 10 20 30 40 60 80 100

OVA
(PPM)



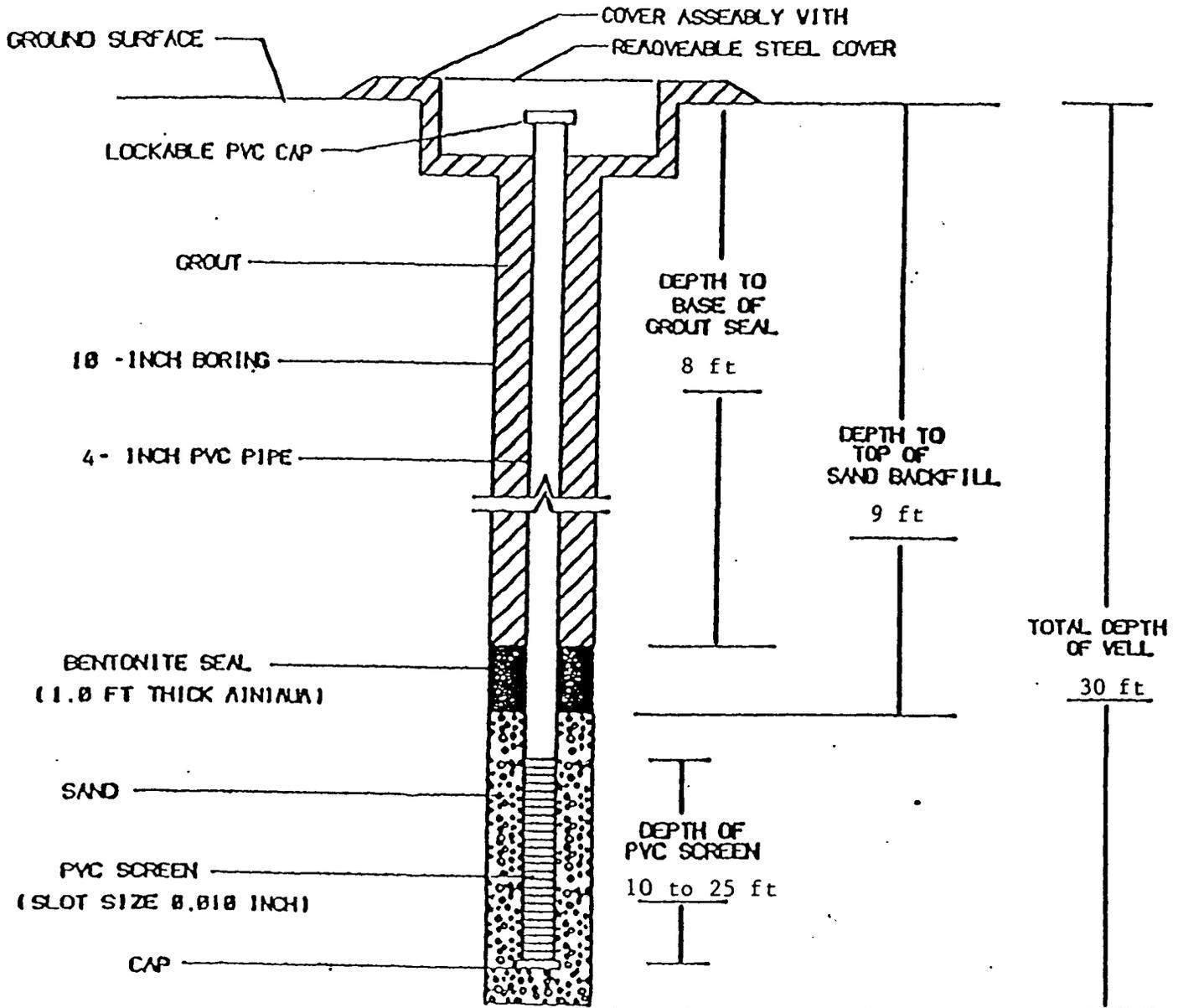
REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-2
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 2 OF 2	
▲ LAW ENGINEERING	

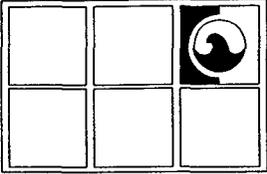
SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

GROUND-WATER MONITORING WELL INSTALLATION RECORD

JOB NAME South Elm St. Sunoco JOB NUMBER 259-97516-01
WELL NUMBER MW-2 GROUND SURFACE ELEVATION _____
LOCATION Greensboro, North Carolina
INSTALLATION DATE December 2, 1993



NOTE: ALL PVC PIPE JOINTS
HAVE SCREW CONNECTORS



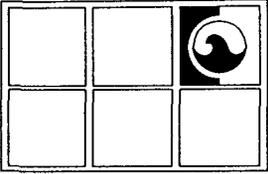
GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY, INC.
 PROJECT NAME: SUN - ELM ST.
 PROJECT NUMBER: 053245445
 LOCATION: 2903 S. ELM ST.
GREENSBORO, NC
 DRILLER: FISHBURNE DRILLING, INC.

DATE 07/08/93 WELL NUMBER MW-2
 CASED FROM 0 TO 5' WITH SCH 40 PVC
 SCREENED FROM 5' TO 30' WITH 0.020" SLOT
 WELL DEPTH 30' WELL DIAMETER 4"
 ELEVATION 596.61'
 ANNULUS COMPLETION SANDPACK 30'-3'; BENTONITE 3'-1'; GROUT 1'-0
 OTHER WELL COMPLETED WITH CONCRETE EMBEDDED MANHOLE COVER & LOCKING CAP

DRILL RIG CME 75
 DRILL METHOD HOLLOW STEM AUGER
 DATE(S) DRILLED JUNE 1, 1993
 LOGGED BY DOUG YEATS

WELL DETAIL	DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS
	0		ASPHALT/crusher-run to 5", SANDY CLAY:	0-2'	BC=7-11-11-9 PID=7
	0.5		Brown, some gravel, mod. stiff, dry		
	1		SANDY CLAY: Brown-red, stiff, dry	2-4'	BC=20-22-18-12 PID=8
	1.5		SANDY CLAY: Drk brn to drk grey, some	4-6'	BC=9-11-50/3 PID=16
	2		gravel fill material, dry		
	2.5		SANDY CLAY W/ASPHALT & GRAVEL: Fill	6-8'	BC=5-50/3 PID=8
	3		material		
	3.5		SANDY CLAY: Green to white, mottled,	8-10'	BC=5-5-5-6 PID=8
	4		moist, soft, slightly friable		
	4.5		SANDY CLAY: Tan-brown, moist, soft	10-12'	BC=3-3-3-4 PID=8
	5				
	5.5		SANDY CLAY: As above, orange-tan-grey,	12-14'	BC=5-4-4-5 PID=21
	6		mottled, very moist (Lab Sample)		
	6.5		SANDY CLAY: Light green to tan, very soft	14-16'	BC=4-3-4-4 PID=11
	7		very moist to saturated		
19	CLAY: Very dark grey w/brown mottles,	19-21'	BC=3-3-5-4 PID=5		
20	plastic, very tight, saturated, mod. soft				
24	CLAY: As above, slightly sandy	24-26'	BC=3-4-4-4 PID=8		
29	SAPROLITE:	29-31'	BC=30-18-10-6 PID=3		
30					



GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY, INC.

PROJECT NAME: SUN - ELM ST.

PROJECT NUMBER: 053245445

LOCATION: 2903 S. ELM ST.

GREENSBORO, NC

DRILLER: FISHBURNE DRILLING, INC.

DATE 07/08/93

WELL NUMBER MW-3

CASED FROM 0 TO 5' WITH SCH 40 PVC

DRILL RIG CME 75

SCREENED FROM 5' TO 25' WITH 0.020" SLOT

DRILL METHOD HOLLOW STEM AUGER

WELL DEPTH 25' WELL DIAMETER 4"

DATE(S) DRILLED JUNE 2, 1993

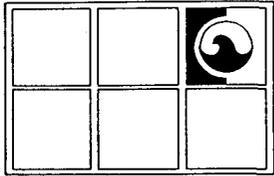
ELEVATION 596.36'

LOGGED BY DOUG YEATS

ANNULUS COMPLETION SANDPACK 25'-3'; BENTONITE 3'-1'; GROUT 1'-0

OTHER WELL COMPLETED WITH CONCRETE EMBEDDED MANHOLE COVER & LOCKING CAP.

WELL DETAIL	DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS
			TOPSOIL to 4", SILTY SANDY CLAY: dry, friable, fill material	0-2'	BC=9-8-7-6 PID=12
			SILTY SANDY CLAY: As above with asphalt in fill material	2-4'	BC=7-6-4-5 PID=7
	5		SANDY CLAY: Brn-reddish grey, gravelly, fill material, sl moist to dry, mod. soft	4-6'	BC=2-3-5-7 PID=2
			SANDY CLAY: Greenish drk brn, w/under- composed plant matter, sl moist, cohesive	6-8'	BC=24-26-12-8 PID=12
	10		SANDY CLAY: As above, with substantial rock debris, sl moist	8-10'	BC=12-8-7-12 PID=1
			SANDY CLAY: As above	10-12'	BC=12-7-3-2 PID=0
			SANDY CLAY: As above	12-14'	BC=11-8-7-5 PID=9
	15		SANDY CLAY: Greenish brn, very moist to saturated, some undercomposed plant matter, soft (Lab Sample)	14-16'	BC=2-2-2-2 PID=13
			SILTY CLAY: Greenish grey to brn, mottled saturated, mod. soft, mod. tight	19-21'	BC=6-6-7-8 PID=3
	25		SILTY CLAY: Greenish grey to brn, very silty, saturated, very tight	24-26'	BC=4-5-5-6
	30				



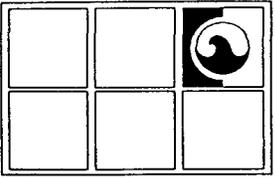
GROUNDWATER TECHNOLOGY INC.

CLIENT: SUN COMPANY, INC.
 PROJECT NAME: SUN - ELM ST.
 PROJECT NUMBER: 053245445
 LOCATION: 2903 S. ELM ST.
GREENSBORO, NC
 DRILLER: FISHBURNE DRILLING, INC.

DATE 07/08/93 WELL NUMBER MW-4

CASED FROM 0 TO 5' WITH SCH 40 PVC DRILL RIG CME 75
 SCREENED FROM 5' TO 25' WITH 0.020" SLOT DRILL METHOD HOLLOW STEM AUGER
 WELL DEPTH 25' WELL DIAMETER 4" DATE(S) DRILLED JUNE 2, 1993
 ELEVATION 596.47' LOGGED BY DOUG YEATS
 ANNULUS COMPLETION SANDPACK 25'-3'; BENTONITE 3'-1'; GROUT 1'-0
 OTHER WELL COMPLETED WITH CONCRETE EMBEDDED MANHOLE COVER & LOCKING CAP

WELL DETAIL	DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS
			ASPHALT/crusher-run to 5", SANDY CLAY:	0-2'	BC=6-5-5-6 PID=360
			Red, mst & cohesive - dry & friable, soft		
			SANDY CLAY: Grn-brn, sl moist, soft to	2-4'	BC=5-4-4-5 PID=120
			2.5', CLAY: Bk, saturated, org. rich w/ some undercomposed plant matter 2.5-3.5'		
	5		CLAY: As above to 5.5', SANDY CLAY: Tan- brn v F to C-gr, dry, friable, mod. stiff	4-6'	BC=4-4-5-9 PID=186
			SANDY CLAY: Tan-greenish brn, v F to C- grained, sl moist sl friable, mod. stiff	6-8'	BC=10-8-10-7 PID=54
	10		SANDY CLAY: Lt grn-tan to off wht, mottled, saprolitic, v moist, mod. stiff	8-10'	BC=4-6-8-6 PID=51
			SANDY CLAY: As above, with orange-tan mottles	10-12'	BC=3-4-4-5 PID=40
	15		SANDY CLAY: Brn, soft, plastic, v moist to saturated (Lab Sample)	12-14'	BC=5-5-6-7 PID=89
			SANDY CLAY: Tree material from 13-14.5', solid wood then, brn, v soft, saturated	14-16'	BC=30-18-4-3 PID=47
	20		SILTY CLAY: Dark grey, organic rich, saturated, very soft	19-21'	BC=3-2-1-2 PID=67
	25		SILTY CLAY: As above	24-26'	BC=5-4-3-5 PID=52
	30				



GROUNDWATER TECHNOLOGY INC.

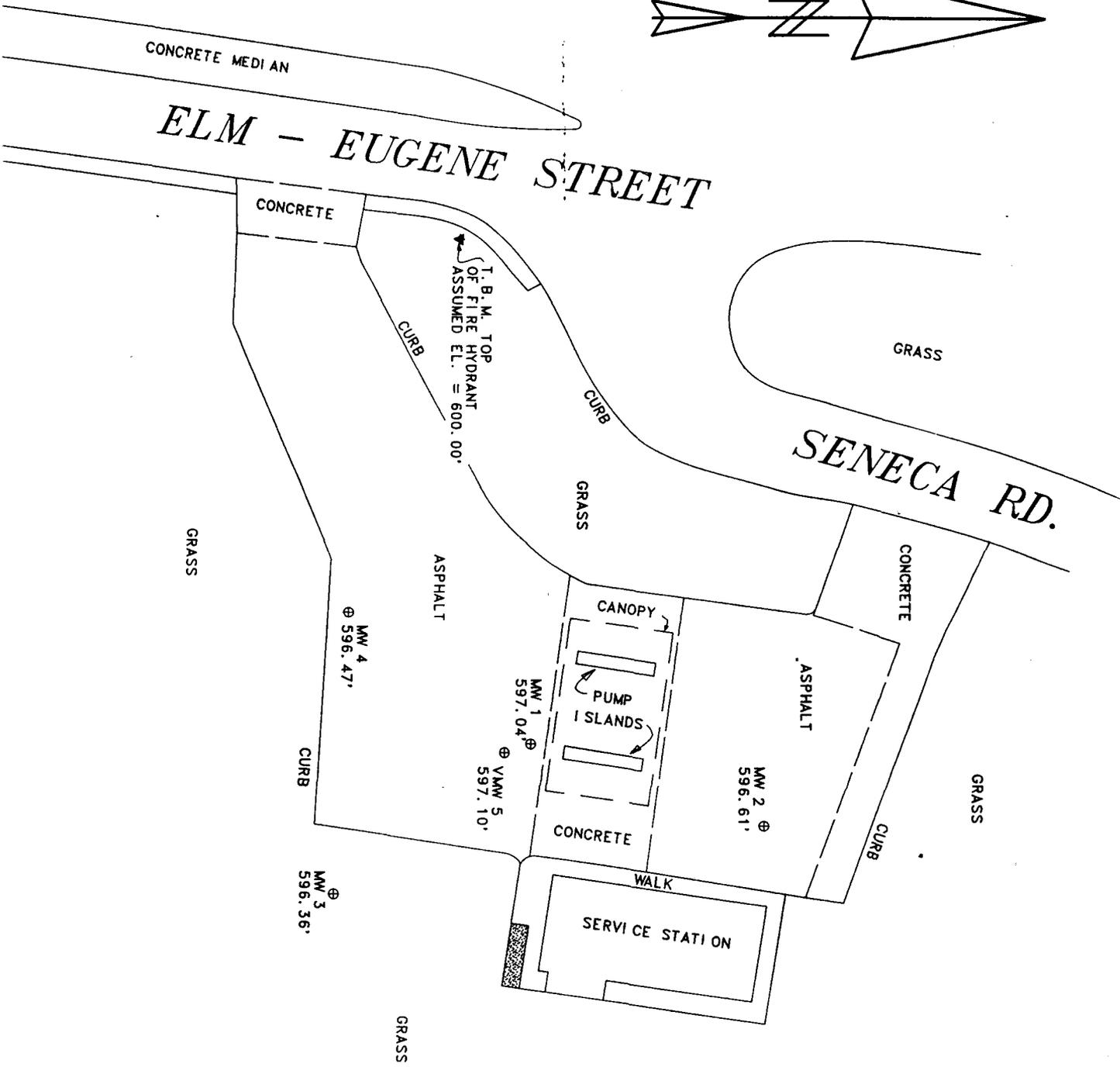
CLIENT: SUN COMPANY, INC.
 PROJECT NAME: SUN - ELM ST.
 PROJECT NUMBER: 053245445
 LOCATION: 2903 S. ELM ST.
GREENSBORO, NC
 DRILLER: FISHBURNE DRILLING, INC.

DATE 07/08/93 WELL NUMBER VMW-5
 CASED FROM 0 TO 43' WITH SCH 40 PVC
 SCREENED FROM 43' TO 48' WITH 0.020" SLOT
 WELL DEPTH 48' WELL DIAMETER 2"
 ELEVATION 597.10'
 ANNULUS COMPLETION SANDPACK 48'-41'; BENTONITE 41'-39'; GROUT 39'-0
 OTHER COMPLETED W/CONCRETE EMBEDDED MH COVER & LOCKING CAP. 6" OUTER CASING TO 35'

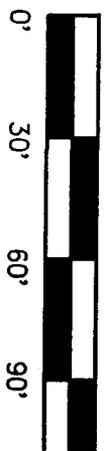
DRILL RIG CME 75
 DRILL METHOD HOLLOW STEM AUGER & AIR ROTARY
 DATE(S) DRILLED JUNE 1, 1993
 LOGGED BY DOUG YEATS

WELL DETAIL	DEPTH	GRAPHIC COLUMN	LITHOLOGICAL DESCRIPTION	SAMPLE	COMMENTS
	5 10 15 20 25 30 35 40 45 50		ASPHALT/crusher-run to 5", SANDY CLAY:	0-2'	BC=5-7-5-9 PID=9
			Red-brn to blk, s gravel, dry, mod. stiff		
			SANDY CLAY: As above, moist, mod. soft	2-4'	BC=6-5-5-20 PID=22
			SANDY CLAY: Drk brn, mod. soft, sl moist	4-6'	BC=5-6-6-8 PID=4
			SANDY CLAY: Drk grn-grey to brn w/under-	6-8'	BC=12-7-9-11 PID=3
			composed plant matter, sl mst, mod. soft		
			SANDY CLAY: Lt grn-grey to brn, organic-	8-10'	BC=2-3-3-2 PID=2
			rich, very soft, very moist		
			SANDY CLAY: As above	10-12'	BC=3-3-2-3 PID=2
			SANDY CLAY: Brk brn to blk, soft, very	12-14'	BC=5-7-7-6 PID=6
			moist to saturated (Lab Sample)		
			SANDY CLAY: As above, Lt brn to grey	14-16'	BC=2-5-6-3 PID=2
			SANDY CLAY: Grey, soft, saturated	16-18'	BC=3-3-3-4 PID=2
			SANDY CLAY: Lt grey, very soft, saturated	18-20'	BC=1-1-1-1 PID=4
			CLAYEY SAND: Lt grey, fine to medium-	25-27'	BC=3-2-3-4 PID=4
			grained, loose, soft, saturated		
			CLAYEY SAND: As above, some gravel	30-32'	BC=2-2-3-3 PID=2
			CLAYEY SAND: As above to 34.5' then	34-36'	BC=15-13-19-22 PID=4
			SAPROLITE: Orange-tan-off white, slightly		
clayey fine to coarse-grained sand,					
highly weathered, sharp contact,					
saturated					

APPENDIX C
WELL-HEAD ELEVATION SURVEY



SCALE: 1" = 30'
 DATE: JUNE 16, 1993



SITE PLAN OF:
 FORMER SUNOCO STATION SITE
 ELM - EUGENE STREET
 GREENSBORO, N.C.

PREPARED FOR:
 GROUNDWATER TECHNOLOGY, INC.
 1000 DEPICTED ROAD

APPENDIX D
SOIL ANALYTICAL REPORTS



4080 Pike Lane
Concord, CA 94520
(510) 685-7852
(800) 544-3422 Inside CA
(800) 423-7143 Outside CA
(510) 825-0720 FAX

Client Number: 053245455
Project ID: 2903 S. Elm St.
Greensboro, NC
Work Order Number: C3-06-0088

June 21, 1993

Teresa L. Watson
Groundwater Technology, Inc.
1000 Perimeter Park Dr., Ste. 1
Morrisville, NC 27560

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 06/05/93, under chain of custody record 29419.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services, Laboratory certification number E1075, to perform analyses for drinking water, wastewater, and hazardous waste materials according to EPA protocols.

If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,

GTEL Environmental Laboratories, Inc.

Eileen F. Bullen
Laboratory Director

Client Number: 053245455
 Project ID: 2903 S. Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0088

ANALYTICAL RESULTS

TPH as Gasoline in Soil

EPA Method 8015^a

GTEL Sample Number		01	02	03	04
Client Identification		MW-2:13	MW-3:15	MW-4:13	VD-1:13
Date Sampled		06/01/93	06/02/93	06/02/93	06/01/93
Date Extracted		NA	NA	NA	NA
Date Analyzed		06/12/93	06/12/93	06/12/93	06/12/93
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
TPH as gasoline	1	1	<1	<1	<1
Detection Limit Multiplier		1	1	1	1
Percent Solids		75.9	75.6	81.0	81.7
BFB surrogate, % recovery		99.1	73.3	83.2	66.3

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual procedures. Bromofluorobenzene surrogate recovery acceptability limits are 60-140%.
 NA = Not Applicable.

Client Number: 053245455
 Project ID: 2903 S. Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0088

ANALYTICAL RESULTS

TPH as Diesel in Soil

Method: Modified EPA 8015^a

GTEL Sample Number		01	02	03	04
Client Identification		MW-2:13	MW-3:15	MW-4:13	VD-1:13
Date Sampled		06/01/93	06/02/93	06/02/93	06/01/93
Date Extracted		06/08/93	06/08/93	06/08/93	06/08/93
Date Analyzed		06/15/93	06/15/93	06/15/93	06/15/93
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
TPH as diesel	10	<10	<10	28	<10
Detection Limit Multiplier		1	1	1	1
Percent Solids		75.9	75.6	81.0	81.7
OTP surrogate, % recovery		81.2	120	112	170

- a. O-Terphenyl surrogate recovery acceptability limits are 50-150%. Test Methods for Evaluating Solid Waste, SW-846, 3rd edition, Rev. O, U.S. EPA, November, 1986.

APPENDIX E

MATERIAL CHARACTERIZATION ANALYTICAL REPORTS



4080 Pike Lane
Concord, CA 94520
(510) 685-7852
(800) 544-3422 Inside CA
(800) 423-7143 Outside CA
(510) 825-0720 FAX

Client Number: 053245455
Project ID: 2903 S. Elm St.
Greensboro, NC
Work Order Number: C3-06-0088

June 21, 1993

Teresa L. Watson
Groundwater Technology, Inc.
1000 Perimeter Park Dr., Ste. 1
Morrisville, NC 27560

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 06/05/93, under chain of custody record 29419.

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If you have any questions concerning this analysis or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,

GTEL Environmental Laboratories, Inc.

A handwritten signature in cursive script that reads "Ron Martin".

A handwritten signature in cursive script that reads "Eileen F. Bullen".

Eileen F. Bullen
Laboratory Director

Client Number: 05324-5455
 Project ID: 2903 S. Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0088

Table 1
ANALYTICAL RESULTS
Volatile Organics and
Total Petroleum Hydrocarbons as Gasoline in Soil
EPA Methods 8020 and Modified 8015^a

GTEL Sample Number		05	061193GCF		
Client Identification		CS-1	METHOD BLANK		
Date Sampled		06/02/93	--		
Date Extracted		NA	NA		
Date Analyzed		06/12/93	06/11/93		
Analyte	Detection Limit, mg/kg	Concentration, mg/kg			
Benzene	0.005	<0.005	<0.005		
Toluene	0.005	0.006	<0.005		
Ethylbenzene	0.005	<0.005	<0.005		
Xylene, total	0.015	<0.015	<0.015		
BTEX, total	--	0.006	--		
TPH as Gasoline	1	<1	<1		
Detection Limit Multiplier		1	1		
Percent solids		80.0	NA		
BFB surrogate, % recovery		85.9	90.2		

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual procedures. Bromofluorobenzene surrogate recovery acceptability limits are 60-140%
 NA = Not Applicable.

Client Number: 053245455
 Project ID: 2903 S. Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0088

ANALYTICAL RESULTS

TPH as Diesel in Soil

Method: Modified EPA 8015^a

GTEL Sample Number		05	061193 GC-I		
Client Identification		CS-1	METHOD BLANK		
Date Sampled		06/02/93	--		
Date Extracted		06/08/93	06/08/93		
Date Analyzed		06/15/93	06/15/93		
Analyte	Detection Limit, mg/Kg	Concentration, mg/Kg			
TPH as diesel	10	<10	<10		
Detection Limit Multiplier		1	1		
Percent Solids		80.0	--		
OTP surrogate, % recovery		120	142		

- a. O-Terphenyl surrogate recovery acceptability limits are 50-150%. Test Methods for Evaluating Solid Waste, SW-846, 3rd edition, Rev. O, U.S. EPA, November, 1986.

Client Number: 053245455
 Project ID: 2903 S. Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0088

Table 1
ANALYTICAL RESULTS
Metals in TCLP Leachate^a

GTEL Sample Number			05	CONTROL 060793		
Client Identification			CS-1	METHOD BLANK		
Date Sampled			06/02/93	--		
Date Leached			06/07/93	06/07/93		
Date Analyzed (Method 6010)			06/15/93	06/15/93		
Date Analyzed (Method 7470)			06/09/93	06/09/93		
Analyte	Method ^b	Detection Limit, mg/L	Leachate Concentration, mg/L			
Arsenic	EPA 6010	0.1	<0.1	<0.1		
Barium	EPA 6010	5	<5	<5		
Cadmium	EPA 6010	0.1	<0.1	<0.1		
Chromium, total	EPA 6010	0.1	<0.1	<0.1		
Lead	EPA 6010	0.5	<0.5	<0.5		
Mercury	EPA 7470	0.004	<0.004	<0.004		
Selenium	EPA 6010	0.5	<0.5	<0.5		
Silver	EPA 6010	0.1	<0.1	<0.1		
Detection Limit Multiplier			1	1		

- a. Federal Register, June 29, 1990, 40 CFR, Part 261, Appendix II - Method 1311.
 b. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986.

Client Number: 053245455
 Project ID: 2903 S. Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0088

ANALYTICAL RESULTS
 Matrix: Soil

Test Description	Units	Detection Limit	Method	Date		Sample Number	05	050693RCI	Test Result
				Sample Analyzed	Sample				
pH		NA	9045	06/08/93	06/02/93	CS-1		METHOD BLANK	
Reactivity Cyanide	mg/Kg	1	ASTM (D5049-90/C)	06/07/93					NA
Reactivity Sulfide	mg/Kg	1	ASTM (D54978-89/A)	06/07/93					<1
Flashpoint	OF	60	EPA 1010	06/15/93					NA
EOX	mg/Kg	10	EPA 9020	06/07/93					<10

Note: Test Methods for Evaluating Solid Waste, SW-846, 3rd edition, Rev. O, U.S. EPA, November, 1986.
 ASTM = American Society for Testing and Materials, 1990.
 NF_≤160 = No flash at temperature less than or equal to 160°.
 NA = Not Applicable.



Company Name: **ITT** Phone #: (919) 467-2271
 Company Address: **ITT** FAX #: (919) 467-2299
 Site location: **ITT**

100 Remington Park Drive, Suite 1, Morrisville, NC 27560
 Project Manager: Client Project ID: (#) 05374-5455-030531

Teressa L. Watson (NAME) 2903 S. Elm St., Greensboro, NC
 Sampler Name (Print): Douglas D. Yates

Test that the proper field sampling procedures were used during the collection of these samples. *DD*

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix				Method Preserved				Sampling				
			WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	HCl	HNO ₃	H ₂ SO ₄	ICE	UNPRESERVED	OTHER (Specify)	DATE
MW-Z-13	01	2	X	X	X	X	X	X	X	X	X	X	6-1	19:30	
MW-3-15	02	2	X	X	X	X	X	X	X	X	X	X	6-2	16:30	
MW-4-13	03	2	X	X	X	X	X	X	X	X	X	X	6-2	10:45	
VD-1-13	04	2	X	X	X	X	X	X	X	X	X	X	6-1	17:30	
CS-1	05	2	X	X	X	X	X	X	X	X	X	X	6-2	16:45	

TAT

Priority (24 hr) Expedited (48 hr) Business Days Other Standard Business Days

QA/QC LEVEL: BLUE CLP OTHER

Special Handling: TAT as gas + dived by SDSO + 5530

SPECIAL DETECTION LIMITS: TAT

REMARKS: Project # = 05374-5455-030531
 Project Name = 2903 S. Elm St., Greensboro, N.C.
 Standard TAT

Lab Use Only Lot # SEAKS INJACS ON ICE AS 70C
 Storage Location: 6/3 (BSC) C3060088

Work Order # 6/3 Received by: T. WATSON

Date 6/4/93 Time 1730

Date 6/5/03 Time 1015

Relinquished by Sampler: Douglas D. Yates
 Relinquished by: T. Watson
 Relinquished by Laboratory: Bruno Cipe

Waybill #

CUSTODY RECORD

APPENDIX F
GROUNDWATER ANALYTICAL REPORTS



4080 Pike Lane
Concord, CA 94520
(510) 685-7852
(800) 544-3422 Inside CA
(800) 423-7143 Outside CA
(510) 825-0720 FAX

Client Number: 053245455
Project ID: Elm St.
Greensboro, NC
Work Order Number: C3-06-0279

June 30, 1993

Teresa Watson
Groundwater Technology, Inc.
1000 Perimeter Park Drive, #1
Morrisville, NC 27560

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories, Inc. on 06/16/93, under chain of custody record 29433.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria, unless otherwise stated in the footnotes.

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Sincerely,
GTEL Environmental Laboratories, Inc.

A handwritten signature in cursive script that reads 'Eileen F. Bullen'.

Eileen F. Bullen
Laboratory Director

Client Number: 053245455
 Project ID: Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0279

Table 1

ANALYTICAL RESULTS

**Aromatic Volatile Organics and
 MTBE in Water**

EPA Methods 5030 and 602^a

GTEL Sample Number		01	02	03	04
Client Identification		VD1	MW1	MW2	MW3
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Analyzed		06/27/93	06/27/93	06/27/93	06/27/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	0.3	5	<0.3	<0.3
Toluene	0.3	0.3	8	<0.3	1
Ethylbenzene	0.3	<0.3	<0.3	<0.3	<0.3
Xylene, total	0.5	0.5	<0.5	<0.5	<0.5
BTEX, total	--	1.1	13	--	1
Methyl-tert-butyl-ether	5	5	230	290	5
Isopropyl ether	1	<1	33	<1	<5*
Detection Limit Multiplier		1	1	1	1
BFB surrogate, % recovery		95.8	95.8	95.2	95.7

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. BFB surrogate recovery acceptability limits are 70-130%.

* Detection limit raised due to interference from non-target compound.

Client Number: 053245455
 Project ID: Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0279

Table 1 (Continued)

ANALYTICAL RESULTS

**Aromatic Volatile Organics and
 MTBE in Water**

EPA Methods 5030 and 602^a

GTEL Sample Number		05	M062793		
Client Identification		MW4	METHOD BLANK		
Date Sampled		06/15/93	--		
Date Analyzed		06/27/93	06/27/93		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	<0.3	<0.3		
Toluene	0.3	<0.3	<0.3		
Ethylbenzene	0.3	<0.3	<0.3		
Xylene, total	0.5	<0.5	<0.5		
BTEX, total	--	--	--		
Methyl-tert-butyl-ether	5	<5	<5		
Isopropyl ether	1	3	<1		
Detection Limit Multiplier		1	1		
BFB surrogate, % recovery		93.0	94.3		

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. BFB surrogate recovery acceptability limits are 70-130%.

Client Number: 053245455
 Project ID: Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0279

Table 1
ANALYTICAL RESULTS
 Purgeable Halocarbons in Water
 EPA Method 601a

GTEL Sample Number		01	02	03	04
Client Identification		VD1	MW1	MW2	MW3
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Analyzed		06/26/93	06/25/93	06/25/93	06/26/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5	11	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Detection Limit Multiplier		1	1	1	1
BFB surrogate, % recovery		99.8	117	107	72.0

a. Federal Register, Vol. 49, October 26, 1984. BFB surrogate recovery acceptability limits are 65-135%.

Table 1 (Continued)
ANALYTICAL RESULTS
 Purgeable Halocarbons in Water
 EPA Method 601^a

GTEL Sample Number		05	062593C		
Client Identification		MW4	METHOD BLANK		
Date Sampled		06/15/93	-		
Date Analyzed		06/26/93	06/25/93		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5		
Bromomethane	0.5	<0.5	<0.5		
Vinyl chloride	1	<1	<1		
Chloroethane	0.5	<0.5	<0.5		
Methylene chloride	0.5	<0.5	<0.5		
1,1-Dichloroethene	0.5	<0.5	<0.5		
1,1-Dichloroethane	0.5	<0.5	<0.5		
1,2-Dichloroethene	0.5	<0.5	<0.5		
Chloroform	0.5	<0.5	<0.5		
1,2-Dichloroethane	0.5	<0.5	<0.5		
1,1,1-Trichloroethane	0.5	<0.5	<0.5		
Carbon tetrachloride	0.5	<0.5	<0.5		
Bromodichloromethane	0.5	<0.5	<0.5		
1,2-Dichloropropane	0.5	<0.5	<0.5		
cis-1,3-Dichloropropene	0.5	<0.5	<0.5		
Trichloroethene	0.5	<0.5	<0.5		
Dichlorodifluoromethane	0.5	<0.5	<0.5		
Dibromochloromethane	0.5	<0.5	<0.5		
1,1,2-Trichloroethane	0.5	<0.5	<0.5		
trans-1,3-Dichloropropene	0.5	<0.5	<0.5		
2-Chloroethylvinyl ether	1	<1	<1		
Bromoform	0.5	<0.5	<0.5		
Tetrachloroethene	0.5	<0.5	<0.5		
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5		
Chlorobenzene	0.5	<0.5	<0.5		
1,2-Dichlorobenzene	0.5	<0.5	<0.5		
1,3-Dichlorobenzene	0.5	<0.5	<0.5		
1,4-Dichlorobenzene	0.5	<0.5	<0.5		
Trichlorofluoromethane	0.5	<0.5	<0.5		
Detection Limit Multiplier		1	1		
BFB surrogate, % recovery		93.0	95.4		

a. Federal Register, Vol. 49, October 26, 1984. BFB surrogate recovery acceptability limits are 65-135%.

Client Number: 053245455
 Project ID: Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0279

Table 1
ANALYTICAL RESULTS
1,2-Dibromoethane in Water
EPA Method 504a

GTEL Sample Number		01	02	03	04
Client Identification		VD1	MW1	MW2	MW3
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Extracted		06/18/93	06/18/93	06/18/93	06/18/93
Date Analyzed		06/18/93	06/18/93	06/18/93	06/18/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
1,2-Dibromoethane	0.02	<0.02	<0.02	<0.02	<0.02
Detection Limit Multiplier		1	1	1	1
DBCP surrogate, % recovery		64.1	83.0	68.2	59.8

GTEL Sample Number		05	061293 EDB		
Client Identification		MW4	METHOD BLANK		
Date Sampled		06/15/93	--		
Date Extracted		06/18/93	06/18/93		
Date Analyzed		06/18/93	06/18/93		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
1,2-Dibromoethane	0.02	<0.02	<0.02		
Detection Limit Multiplier		1	1		
DBCP surrogate, % recovery		54.4	79.8		

a. Methods for the Determination of Organic Compounds in Drinking Water, EPA/600/4-88/039, Revision 2.0, USEPA, December 1988.

Client Number: 053245445
 Project ID: Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0279

Table 1
ANALYTICAL RESULTS
 Semi-Volatile Organics in Water
 EPA Method 8270^a/625^b

GTEL Sample Number		01	02	03	04
Client Identification		VD1	MW1	MW2	MW3
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Extracted		06/17/93	06/17/93	06/17/93	06/17/93
Date Analyzed		06/23/93	06/23/93	06/23/93	06/23/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
bis(2-Chloroethyl)ether	10	< 10	< 10	< 10	< 10
1,3-Dichlorobenzene	10	< 10	< 10	< 10	< 10
1,4-Dichlorobenzene	10	< 10	< 10	< 10	< 10
1,2-Dichlorobenzene	10	< 10	< 10	< 10	< 10
bis-(2-Chloroisopropyl)ether	10	< 10	< 10	< 10	< 10
N-Nitroso-di-propylamine	10	< 10	< 10	< 10	< 10
Hexachloroethane	10	< 10	< 10	< 10	< 10
Nitrobenzene	10	< 10	< 10	< 10	< 10
Isophorone	10	< 10	< 10	< 10	< 10
bis(2-Chloroethoxy)methane	10	< 10	< 10	< 10	< 10
1,2,4-Trichlorobenzene	10	< 10	< 10	< 10	< 10
Naphthalene	10	< 10	< 10	< 10	19
4-Chloroaniline	10	< 10	< 10	< 10	< 10
Hexachlorobutadiene	10	< 10	< 10	< 10	< 10
2-Methylnaphthalene	10	< 10	< 10	< 10	< 10
Hexachlorocyclopentadiene	10	< 10	< 10	< 10	< 10
2-Chloronaphthalene	10	< 10	< 10	< 10	< 10
2-Nitroaniline	50	< 50	< 50	< 50	< 50
Dimethylphthalate	10	< 10	< 10	< 10	< 10
Acenaphthylene	10	< 10	< 10	< 10	< 10
3-Nitroaniline	50	< 50	< 50	< 50	< 50
Acenaphthene	10	< 10	< 10	< 10	< 10
4-Nitrophenol	50	< 50	< 50	< 50	< 50
Dibenzofuran	10	< 10	< 10	< 10	< 10
2,4-Dinitrotoluene	10	< 10	< 10	< 10	< 10
2,6-Dinitrotoluene	10	< 10	< 10	< 10	< 10

Table 1 (Continued)

ANALYTICAL RESULTS

**Semi-Volatile Organics in Water
 EPA Method 8270^a/625^b**

GTEL Sample Number		01	02	03	04
Client Identification		VD1	MW1	MW2	MW3
Date Sampled		06/15/93	06/15/93	06/15/93	06/15/93
Date Extracted		06/17/93	06/17/93	06/17/93	06/17/93
Date Analyzed		06/23/93	06/23/93	06/23/93	06/23/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Diethylphthalate	10	<10	<10	<10	<10
4-Chlorophenyl-phenylether	10	<10	<10	<10	<10
Fluorene	10	<10	<10	<10	<10
4-Nitroaniline	50	<50	<50	<50	<50
N-Nitrosodiphenylamine	10	<10	<10	<10	<10
4-Bromophenyl-phenylether	10	<10	<10	<10	<10
Hexachlorobenzene	10	<10	<10	<10	<10
Phenanthrene	10	<10	<10	<10	<10
Anthracene	10	<10	<10	<10	<10
Di-n-butylphthalate	10	<10	<10	<10	<10
Fluoranthene	10	<10	<10	<10	<10
Pyrene	10	<10	<10	<10	<10
Butylbenzylphthalate	10	<10	<10	<10	<10
3,3'-Dichlorobenzidine	20	<20	<20	<20	<20
Benzo(a)anthracene	10	<10	<10	<10	<10
bis(2-Ethylhexyl)phthalate	10	<10	<10	<10	<10
Chrysene	10	<10	<10	<10	<10
Di-n-octylphthalate	10	<10	<10	<10	<10
Benzo(b)fluoranthene	10	<10	<10	<10	<10
Benzo(k)fluoranthene	10	<10	<10	<10	<10
Benzidine	20	<20	<20	<20	<20
Benzo(a)pyrene	10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	10	<10	<10	<10	<10
Dibenz(a,h)anthracene	10	<10	<10	<10	<10
Benzo(g,h,i)perylene	10	<10	<10	<10	<10
Detection Limit Multiplier		1	1	1	1
d5-Nitrobenzene surr., % rec.		80.4	75.0	76.4	43.8
2-Fluorobiphenyl surr., % rec.		56.2	42.6	49.4	47.8
d14-Terphenyl surr., % rec.		95.6	76.4	79.6	81.6

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Sample extraction by EPA Method 3510.
 b. Federal Register, Vol. 49, October 26, 1984. Sample extraction by EPA Method 3510.

Client Number: 053245445
 Project ID: Elm St.
 Greensboro, NC
 Work Order Number: C3-06-0279

Table 1

ANALYTICAL RESULTS

**Semi-Volatile Organics in Water
 EPA Method 8270^a/625^b**

GTEL Sample Number		05	061993BN-1		
Client Identification		MW4	METHOD BLANK		
Date Sampled		06/15/93	06/15/93		
Date Extracted		06/17/93	06/17/93		
Date Analyzed		06/23/93	06/23/93		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
bis(2-Chloroethyl)ether	10	< 10	< 10		
1,3-Dichlorobenzene	10	< 10	< 10		
1,4-Dichlorobenzene	10	< 10	< 10		
1,2-Dichlorobenzene	10	< 10	< 10		
bis-(2-Chloroisopropyl)ether	10	< 10	< 10		
N-Nitroso-di-propylamine	10	< 10	< 10		
Hexachloroethane	10	< 10	< 10		
Nitrobenzene	10	< 10	< 10		
Isophorone	10	< 10	< 10		
bis(2-Chloroethoxy)methane	10	< 10	< 10		
1,2,4-Trichlorobenzene	10	< 10	< 10		
Naphthalene	10	< 10	< 10		
4-Chloroaniline	10	< 10	< 10		
Hexachlorobutadiene	10	< 10	< 10		
2-Methylnaphthalene	10	< 10	< 10		
Hexachlorocyclopentadiene	10	< 10	< 10		
2-Chloronaphthalene	10	< 10	< 10		
2-Nitroaniline	50	< 50	< 50		
Dimethylphthalate	10	< 10	< 10		
Acenaphthylene	10	< 10	< 10		
3-Nitroaniline	50	< 50	< 50		
Acenaphthene	10	< 10	< 10		
4-Nitrophenol	50	< 50	< 50		
Dibenzofuran	10	< 10	< 10		
2,4-Dinitrotoluene	10	< 10	< 10		
2,6-Dinitrotoluene	10	< 10	< 10		

Table 1 (Continued)

ANALYTICAL RESULTS

**Semi-Volatile Organics in Water
 EPA Method 8270^a/625^b**

GTEL Sample Number		05	061993BN-1		
Client Identification		MW4	METHOD BLANK		
Date Sampled		06/15/93	06/15/93		
Date Extracted		06/17/93	06/17/93		
Date Analyzed		06/23/93	06/23/93		
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Diethylphthalate	10	<10	<10		
4-Chlorophenyl-phenylether	10	<10	<10		
Fluorene	10	<10	<10		
4-Nitroaniline	50	<50	<50		
N-Nitrosodiphenylamine	10	<10	<10		
4-Bromophenyl-phenylether	10	<10	<10		
Hexachlorobenzene	10	<10	<10		
Phenanthrene	10	<10	<10		
Anthracene	10	<10	<10		
Di-n-butylphthalate	10	<10	<10		
Fluoranthene	10	<10	<10		
Pyrene	10	<10	<10		
Butylbenzylphthalate	10	<10	<10		
3,3'-Dichlorobenzidine	20	<20	<20		
Benzo(a)anthracene	10	<10	<10		
bis(2-Ethylhexyl)phthalate	10	<10	<10		
Chrysene	10	<10	<10		
Di-n-octylphthalate	10	<10	<10		
Benzo(b)fluoranthene	10	<10	<10		
Benzo(k)fluoranthene	10	<10	<10		
Benzdine	20	<20	<20		
Benzo(a)pyrene	10	<10	<10		
Indeno(1,2,3-cd)pyrene	10	<10	<10		
Dibenz(a,h)anthracene	10	<10	<10		
Benzo(g,h,i)perylene	10	<10	<10		
Detection Limit Multiplier		1	1		
d5-Nitrobenzene surr., % rec.		74.0	69.4		
2-Fluorobiphenyl surr., % rec.		44.8	45.6		
d14-Terphenyl surr., % rec.		81.8	85.8		

- a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Sample extraction by EPA Method 3510.
 b. Federal Register, Vol. 49, October 26, 1984. Sample extraction by EPA Method 3510.

Company Name: **GTI** Phone #: 919 467 2227
 Company Address: **Morrisville NC** FAX #: 919 467 2299
 Site location: **ELM ST. Greensboro NC**
 Project Manager: **T. Watson** Client Project ID: (#) 053245455-030543
 (NAME) **SAM** ELM ST.
 Sampler Name (Print): **Aaron Hill**

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix			Method Preserved				Sampling			
			WATER	AIR	SLUDGE	PRODUCT	OTHER	HCl	HNO ₃	H ₂ SO ₄	ICE	UNRESERVED	OTHER (SPECIFY)
V01	1101	5	X			X						6-15	1630
MW1	1102	5	X			X						1640	
MW2	1103	5	X			X						1650	
MW3	1104	5	X			X						1700	
MW4	1105	5	X			X						1710	

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot # **6/16/93 (BFC)** Storage Location: **SEAKS INTACT, ON ICE AT 4°C**

Work Order # **6/16/93 (BFC)**

Received by: **FED EX RLY**

Received by: _____

CUSTODY RECORD

Relinquished by Sampler: **Aaron Hill**

Relinquished by: _____

Relinquished by: _____

Date: **6/15/93** Time: **1900**

Date: _____ Time: _____

Date: **6/16/93** Time: **0910**

Received by Laboratory: **B. [Signature]**

Waybill # _____

<input type="checkbox"/> BTEX/Gas Hydrocarbons PID/FID <input type="checkbox"/> with MTBE <input type="checkbox"/> with MTHB <input type="checkbox"/> 8020 <input type="checkbox"/>	<input type="checkbox"/> EPA 602 <input type="checkbox"/> EPA 8020 <input type="checkbox"/>	<input type="checkbox"/> EPA 601 <input type="checkbox"/> EPA 8010 <input type="checkbox"/>	<input type="checkbox"/> EPA 608 <input type="checkbox"/> 8080 <input type="checkbox"/> PCB only <input type="checkbox"/>	<input type="checkbox"/> EPA 624/PPL <input type="checkbox"/> 8240/TAL <input type="checkbox"/> NBS (+15) <input type="checkbox"/>	<input type="checkbox"/> EPA 625/PPL <input type="checkbox"/> 8270/TAL <input type="checkbox"/> NBS (+25) <input type="checkbox"/>	<input type="checkbox"/> EPA 610 <input type="checkbox"/> 8310 <input type="checkbox"/>	<input type="checkbox"/> EP TOX Metals <input type="checkbox"/> Pesticides <input type="checkbox"/> Herbicides <input type="checkbox"/>	<input type="checkbox"/> TCLP Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-VOA <input type="checkbox"/> Pest <input type="checkbox"/> Herb <input type="checkbox"/>	<input type="checkbox"/> EPA Metals - Priority Pollutant <input type="checkbox"/> TAL <input type="checkbox"/> RCRA <input type="checkbox"/>	<input type="checkbox"/> CAM Metals TLLC <input type="checkbox"/> STLC <input type="checkbox"/>	<input type="checkbox"/> Lead 239.2 <input type="checkbox"/> 200.7 <input type="checkbox"/> 7420 <input type="checkbox"/> 7421 <input type="checkbox"/> 6010 <input type="checkbox"/>	<input type="checkbox"/> Organic Lead <input type="checkbox"/>	<input type="checkbox"/> Corrosivity <input type="checkbox"/> Flash Point <input type="checkbox"/> Reactivity <input type="checkbox"/>	X X X X X <i>Base Metals</i>
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REMARKS

BTEX/602 + MTHB + JAE (2) vials
acidified w/HCl
- all others unacidified

C3060279