



**Sun Refining and  
Marketing Company**  
Eleven Penn Center  
1835 Market Street  
Philadelphia PA 19103-2990

Regional Supervisor  
North Carolina Department of Environment  
Health and Natural Resources  
Region IV  
Division of Environmental Management  
Groundwater Section - Pollution Control Branch  
8025 North Point Blvd.  
Winston-Salem, NC 27106

RECEIVED  
N.C. Dept. of EHNR

MAR 15 1993

Winston-Salem  
Regional Office

Re: Mid-States Oil Environmental Site Assessments

Dear Regional Supervisor:

As per my last letter to you, attached is the environmental assessment report that was prepared as part of a real estate transaction for the property noted below:

South Elm Sunoco  
2903 South Elm Street  
Greensboro, NC  
0275-7516

We will forward any further information/data we gather for this site to your attention. If you have any questions, feel free to contact Mr. Dan Shine at (215) 499-5705 or me at (215) 977-6145.

Sincerely,

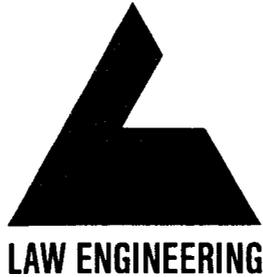
Tinamarie V. Smith  
Senior Environmental Specialist

TVS:vlp

Attachment

cc: N. Perez  
D. Shine  
D. Justin  
File  
Chron





**MID-STATE OIL COMPANY**

**DIVESTMENT CONTAMINATION REPORT**

South Elm Sunoco  
2903 South Elm Street  
Greensboro, North Carolina

Duns No. 0275-7516

Sun Refining and Marketing Company  
1835 West Market Street  
11 Penn Center 9th Floor  
Philadelphia, PA 19103-2950

TABLE OF CONTENTS



**EXECUTIVE SUMMARY** . . . . . 1

**1.0 SITE DESCRIPTION** . . . . . 1

        1.1 Site Location . . . . . 1

        1.2 Adjacent Properties . . . . . 1

        1.3 Regulatory List Review . . . . . 2

        1.4 Area Topography . . . . . 3

        1.5 Bay Drains . . . . . 3

        1.6 Contaminated Soil Stored On Site . . . . . 3

**2.0 SITE HISTORY** . . . . . 4

        2.1 UST Systems . . . . . 4

        2.2 Other Reporting . . . . . 4

**3.0 REGIONAL HYDROGEOLOGY** . . . . . 4

        3.1 Local Aquifer Usage & Classification . . . . . 4

        3.2 Private Wells . . . . . 5

        3.3 Municipal Wells . . . . . 5

**4.0 METHODS OF INVESTIGATION** . . . . . 5

        4.1 Soil Borings and Sampling . . . . . 5

        4.2 OVA Screening . . . . . 7

        4.3 Soil Sample Collection . . . . . 7

        4.4 Monitoring Well Installation . . . . . 8

        4.5 Surveying . . . . . 10

        4.6 Monitoring Well Development . . . . . 10

        4.7 Monitoring Well Sampling . . . . . 11

TABLE OF CONNTENTS (cont)



5.0 RESULTS OF ASSESSMENT . . . . . 12

    5.1 Sensitive Receptors and Adjacent UST Sources . . . . . 12

    5.2 Depth to Ground Water and Ground-Water Flow Direction . . . . . 13

    5.3 Results of Soil Sample Analyses . . . . . 13

    5.4 Results of Free Product Gauging . . . . . 14

    5.5 Results of Ground-Water Sampling . . . . . 14

6.0 QUALIFICATION OF REPORT . . . . . 14

TABLES

- Table 1 - Results of OVA Screening
- Table 2 - BTEX Concentrations Detected in Soil Samples
- Table 3 - TPH Concentrations Detected in Soil Samples
- Table 4 - Results of Free Product Gauging
- Table 5 - BTEX Concentrations Detected in Ground-Water
- Table 6 - TPH Concentrations Detected in Ground-Water

FIGURES

- Figure 1 - Site Location Map
- Figure 2 - Adjacent Properties Map
- Figure 3 - Soil Boring Locations
- Figure 4 - BTEX in Ground Water
- Figure 5 - TPH in Ground Water

APPENDIX

- Soil Test Boring Logs
- Monitoring Well Construction Diagrams
- Laboratory Analytical Data Reports
- Monitoring Well Construction Permit



## 1.0 SITE DESCRIPTION

### 1.1 Site Location

The South Elm Sunoco is located at 2903 South Elm Street in Greensboro, North Carolina (Figure 1). This area is predominantly developed with commercial businesses. The site consists of one building, two gasoline dispensing pump islands, five underground storage tanks (USTs), and one above ground fuel oil tank.

### 1.2 Adjacent Properties

A site reconnaissance was conducted by Ms. Denise Poulos of Law Engineering on November 16, 1992. During the site reconnaissance, observations of the site and adjacent property visible from the site were made to identify visible evidence of potential sources of contamination that may impact the site.

Contiguous property to the north and east is developed with a Howard Johnson Hotel. Contiguous property to the south is an unnamed tributary of South Buffalo Creek. An Amoco Service Station is located approximately 350 feet south of the site. Monitoring wells and an apparent ground-water remediation system were observed at the Amoco Station. Contiguous property to the west, across South Elm Street, is developed with a Texaco Service Station (Figure 2).

During visual reconnaissance of the adjoining properties, we sought to identify off-site facilities that may reasonably have USTs or generate hazardous wastes. Field indicators of USTs, such as gas



pumps, vent stacks, fill ports, monitoring wells, etc. were specifically sought during our site reconnaissance. Evidence of underground storage tanks was observed at the Amoco Station located south of the site and at the Texaco Station located west of the site.

1.3 Regulatory List Review

We have reviewed the EPA North Carolina National Priorities List (Superfund sites), current as of October 1, 1992, for listings located within a one-half mile radius of the site. Appearance on this list indicates a documented contaminated site. No listed sites were located within one-half mile of the subject site.

We have reviewed the North Carolina Department of Natural Resources and Community Development Pollution Incident Report with Addresses, dated October 6, 1992, for listings located within a one-half mile radius of the site. Appearance on this list indicates a documented contamination incident. The following sites appear on this listing:

Facility and Address	Approximate Location Relative to the Site
Amoco - Elm Street 2915 South Elm Street	Immediately South
Brockman Ford Tractor Company 2820 South Elm Street	1300 Ft North
Burlington Industries-Meadowview Meadowview Road	1300 Ft North



Carolina By-Products  
2410 Randolph Avenue

2600 Ft Northeast

Stockhausen  
Elm-Eugene

2600 Ft North

#### 1.4 Area Topography

The site is situated in the flood plain of South Buffalo Creek. Topographic drawings indicate that surface drainage on the site is generally to the south toward an unnamed tributary of South Buffalo Creek (Figure 1). The direction of ground-water flow inferred from the surface topography is to the south. Areas to the north are upgradient of the site based on the direction of ground-water flow inferred from the surface topography.

#### 1.5 Bay Drains

As part of the site reconnaissance, visual observations were made to identify existing or former bay drains. Bay drains were identified at the site. Based on discussions with the station operator, we learned that existing bay drains are thought to be connected to the sanitary sewer.

#### 1.6 Contaminated Soil Stored On Site

We did not observe contaminated soil stored on-site prior to this assessment. Approximately three cubic yards of soil generated by



the drilling of twelve soil borings are stockpiled on-site at the location indicated in Figure 3.

## 2.0 SITE HISTORY

### 2.1 UST Systems

Based on information provided to Law Engineering by Sun Refining and Marketing Company, the USTs present at the site include:

<u>Quantity</u>	<u>Size</u>	<u>Construction</u>	<u>Year Installed</u>
1	1,000	Steel	1970
3	6,000	Steel	1970
1	6,000	Fiberglass	1982

### 2.2 Other Reporting

Sun Refining and Marketing Company was unable to provide any existing environmental files concerning the site. No further environmental file reviews for the site were conducted.

## 3.0 REGIONAL HYDROGEOLOGY

### 3.1 Local Aquifer Usage & Classification

The site is located in the Carolina Slate Belt of the Piedmont Physiographic Province, an area underlain by metamorphic rock. The local ground-water aquifer is classified by the North Carolina Environmental Management Commission as Class GA waters (North



Carolina Administrative Code, Title 15, Subchapter 2L, Section .0201). Class GA waters are existing or potential sources of drinking water suitable for human consumption.

### 3.2 Private Wells

We contacted Ms. Eleanor Clark of the City of Greensboro Water and Sewer Division. Ms. Clark informed us that the site and surrounding properties are served by the municipal water system. However, private wells may be in use in the vicinity of the site. No private wells were identified in the vicinity of the site.

### 3.3 Municipal Wells

Municipal wells are not utilized by the City of Greensboro. The City of Greensboro pipes its water from reservoirs located in Guilford County. No municipal wells were identified in the vicinity of the site.

## 4.0 METHODS OF INVESTIGATION

### 4.1 Soil Borings and Sampling

Law Engineering personnel drilled 10 soil borings to depths ranging from 3.5 to 30 feet below grade (MW-1 through MW-4) on December 1, 1992). The borings were drilled using a truck-mounted auger drilling rig equipped with 10-inch O.D. (6 1/4-inch I.D.) hollow-



SUN REFINING AND MARKETING COMPANY

---

stem augers. To prevent cross contamination, the downhole drilling equipment was steam cleaned prior to commencing activities at each boring location.

The termination depth of each boring was selected based on consideration of auger refusal the depth to ground water at each location, as indicated by soil moisture conditions, auger cuttings, observations of water within the boreholes, and the objectives stated in the contracted scope of services specified by Sun Refining and Marketing Company.

Soil samples were collected at five-foot intervals starting at a depth of 3.5 feet below the ground surface. The samples were collected using a split-spoon sampler 18-inches long having an inside diameter of 1 3/4-inches. The soil sampling methodology was performed in general accordance with ASTM D-1586. Representative samples were classified in the field by Law Engineering's on-site field personnel. Soil Test Boring Records were completed for each boring and are contained in the Appendix.

Because only one hollow-stem auger soil boring encountered ground water prior to auger refusal, Sun Refining and Marketing requested that Law Engineering arrange for an air rotary drilling rig to be mobilized to the site. On February 8, 1993, Law Engineering's subcontractor (Ground Water Protection of Charlotte, North Carolina) drilled two additional soil borings (MW-3 and SB-5) utilizing an air rotary drilling rig. The two soil borings were each drilled to a depth of approximately 16 feet below grade. Residual soils were encountered at this depth. Soil samples were



collected from the termination depth of each soil boring. The samples were collected by hydraulically pushing a decontaminated split-spoon sampler.

The split-spoon samplers were decontaminated prior to each use utilizing the following procedure:

- o High pressure steam cleaning with potable (tap) water

#### 4.2 OVA Screening

Representative portions of each soil sample obtained from the borings were transferred into a new, clean one-quart capacity zip-lock baggy (half full), and the baggy placed in a warm location. Approximately ten minutes after the time of collection, the baggy was opened slightly, the probe of a Century 128 Organic Vapor Analyzer inserted, and the baggy immediately resealed using finger pressure. The meter of the OVA was monitored and the reading recorded. An OVA is useful only as a screening tool in evaluating the absence or presence of volatile organic compounds (VOCs), and should not be relied upon to quantify VOCs in soil samples. The results of the OVA screening are included as Table 1.

#### 4.3 Soil Sample Collection

Immediately after collection each subsurface sample was removed from the split-spoon sampler by hand using new disposable vinyl gloves, and a representative portion packed into one clean, four-ounce and one two-ounce capacity glass containers equipped with a



teflon-lined screw caps. The sample containers were packed tightly with sample to minimize available headspace.

After being filled, each sample container was labeled with the job name and number, the time and date of sample collection, the analyses to be performed, and the presence or absence of preservative. The filled sample containers were placed into a new one-quart capacity zip-lock baggy. The baggy containing the filled sample containers was then placed into a cooler containing ice and cooled to approximately 4° Centigrade. The Chain of Custody was initiated.

At the end of each sampling day the coolers containing samples were shipped via overnight express delivery to Law Environmental National Laboratories (LENL) in Kennesaw, Georgia. LENL analyzed the samples for benzene, toluene, ethylbenzene and xylenes (BTEX) using the EPA Method 8020, and total semi-volatile petroleum hydrocarbons (TPH) using the EPA Method 8015. The Chain of Custody was maintained, as documented in the Appendix.

#### 4.4 Monitoring Well Installation

After completion of the soil borings, the boring terminated in ground water was converted to a monitoring well with a depth of 25 feet below the ground surface (MW-2). This depth was selected based on consideration of the depth to ground water, as indicated by soil moisture conditions, auger cuttings, observations of water within the borehole, and the objectives stated in the contracted scope of services specified by Sun Refining and Marketing Company.



SUN REFINING AND MARKETING COMPANY

---

Soil boring MW-2 was converted to a Type II ground-water monitoring well constructed with four-inch I.D. Schedule 40 PVC flush-threaded casing and screen. The PVC screen and casing were lowered through the annulus of the augers to the appropriate depth. A 15-foot slotted well screen with machined 0.010-inch slot widths was installed at the bottom of the well. A threaded bottom plug was placed at the bottom of the well screen.

A solid section of PVC riser pipe was placed above the screened interval and extended to a point just below grade. The annular space around the well was filled with a washed and graded sand to a depth equivalent to approximately one foot above the top of the screen.

A minimum one-foot thick seal of bentonite was placed immediately above the sand pack. After placement in the well, the bentonite was hydrated by applying approximately ten gallons of potable (tap) water and waiting approximately 30 minutes.

After hydrating the bentonite pellets, a bentonite/neat cement mixture containing approximately four percent bentonite was pumped down the hole to fill the annulus of the boring from the bentonite seal to the ground surface. The well was installed with a flush-mounted steel cover. The well was equipped with a lockable, water-tight well cap. The general construction details for the well are shown on the Boring Logs and Well Installation Diagram in the Appendix.



#### 4.5 Surveying

Because only one ground-water monitoring well (MW-2) was installed, surveying of the relative elevation of the top of casing was not performed at the site.

#### 4.6 Monitoring Well Development

After installation the well was developed by evacuating at least five well volumes, or to dryness twice, using a decontaminated three-foot long, three-inch I.D. PVC bailer. The bailer was decontaminated utilizing the following procedure:

- o Rinsing with potable (tap) water
- o Washing in an Alcanox-potable water solution
- o Rinsing with potable water

The well was developed to achieve two objectives: 1) to remove sand, silt and other fine sediments which may have entered the well during its construction; and 2) to develop the sandpack surrounding the wells' screened intervals.

During development, the pH of the development water from the well was monitored. The pH of the well development water was 6.5 standard units.

#### 4.7 Monitoring Well Sampling

Monitoring well MW-2 was sampled on January 20, 1993 (a minimum of seven days after development). The well was purged by removing at least three but not more than five well volumes, or bailing to dryness and allowing recovery of approximately 75 percent of the well's volume. Purging was accomplished using a new one-liter capacity disposable teflon bailer. After the purging of a well was completed a ground-water sample was immediately collected from the well.

Immediately after collection, the ground-water sample was transferred from the bailer into three 40 milliliter (ml) and two 1-liter clean, glass containers equipped with teflon-lined screw-caps. New disposable vinyl gloves were utilized in the sample transfer. The sample containers were completely filled with sample to eliminate headspace.

After being filled, each sample container was labeled with the job name and number, the time and date of sample collection, the analyses to be performed, and the presence or absence of preservative. The filled sample containers were then placed into a cooler containing blue ice, or zip lock baggies containing ice, and cooled to approximately 4° Centigrade. The Chain of Custody was initiated.

At the end of the sampling day the cooler containing samples was shipped via overnight express delivery to LENL. LENL analyzed the



sample for BTEX (EPA Method 602) and TPH (EPA Method 8015). The Chain of Custody was maintained, as documented in the Appendix.

## 5.0 RESULTS OF ASSESSMENT

### 5.1 Sensitive Receptors and Adjacent UST Sources

The site is located at 2903 South Elm Street in Greensboro, North Carolina and has been developed with the South Elm Sunoco. An unnamed tributary of South Buffalo Creek is located immediately south of the site. No private or municipal wells were identified in the vicinity of the site.

The site is located in a commercial area of Greensboro, North Carolina. Evidence of underground storage tanks was identified at the Amoco at Texaco Stations located south and west of the site, respectively. These facilities do not appear to be upgradient of the site based on the direction of ground-water flow inferred from the surface topography.

Our review of selected regulatory lists identified several contaminated facilities in the vicinity of the site. The nearest of these facilities is the Amoco Station located approximately 300 feet south of the site. This facility does not appear to be upgradient of the subject property.

## 5.2 Depth to Ground Water and Ground-Water Flow Direction

As measured in the newly-installed monitoring well (MW-2), the depth of the ground-water table below the site ground surface was 9.6 feet. The direction of ground-water flow was not determined using well survey and depth to ground-water data because only one ground-water monitoring well was installed at the site.

## 5.3 Results of Soil Sample Analyses

During drilling of the soil borings, a total of five subsurface soil samples were collected for laboratory analyses (Table 1). Laboratory analyses of the soil samples detected BTEX or TPH concentrations in three of the five samples (Tables 2 and 3, respectively).

The highest detected concentration of BTEX (0.0983 ppm) detected in the five soil samples was detected in the sample collected from boring MW-2. The next highest detected concentration of BTEX (0.0031 ppm) was detected in the sample collected from boring MW-4. BTEX concentrations were not detected in the other three samples collected from the other soil borings.

The highest detected concentration of TPH (290 ppm) detected in the five soil samples was detected in the sample collected from boring MW-1. The next highest detected concentration of TPH were detected in the samples collected from borings MW-2 (170 ppm) and MW-4 (41 ppm). TPH concentrations were not detected in the soil samples collected from the other soil borings.



#### 5.4 Results of Free Product Gauging

Depth to ground water and separate-phase hydrocarbon thickness was measured by Law Engineering personnel on January 20, 1993 (Table 4). All fluid measurements at the site were measured using the highest point at the top of the well casing as a reference point, and using a Solinst Model 121 interface probe. The well installed at the subject site did not have a detectable occurrence of separate-phase hydrocarbon.

#### 5.5 Results of Ground-Water Sampling

The one ground-water monitoring well installed at the site was sampled on January 20, 1993. The BTEX (Table 5) and TPH concentrations (Table 6) detected were plotted on separate site maps (Figures 4 and 5, respectively).

BTEX (13 ppb) and TPH (690 ppb) concentrations were detected in ground-water sample collected from well MW-2.

### 6.0 QUALIFICATION OF REPORT

The activities and evaluative approaches used in this assessment are consistent with those normally employed in hydrogeological assessments and waste management projects of this type. Our evaluation of site conditions has been based on our understanding of the site, the site specific information provided by Sun Oil Company, and the data obtained from the site assessment and remediation activities performed to date at the subject site. The



**SUN REFINING AND MARKETING COMPANY**

---

primary objective of this assessment was to perform sufficient work to determine if detectable petroleum hydrocarbon contamination in soil or ground-water exists at the site.

**TABLES**

**TABLE 1**  
**RESULTS OF OVA SCREENING**  
**SOUTH ELM STREET SUNOCO**  
**GREENSBORO, NORTH CAROLINA**  
**DUNS NO. 0275-7516**

Boring	Depth-FT	OVA-PPM
MW-1	3.5 to 5.0	>1000*
MW-2	3.5 to 5.0	>1000*
	8.5 to 10.0	980
	13.5 to 15.0	550
	18.5 to 20.0	300
	23.5 to 25.0	80
	28.5 to 30.0	80
MW-3	18.0 to 20.0	360*
MW-4A (Off-set of MW-4)	3.5 to 5.0	70
	8.5 to 10.0	200
	13.5 to 15.0	NS*
SB-5	18.0 to 20.0	1*

NS = Not Screened

\* = Sample collected for laboratory analyses.

TABLE 2

BTEX CONCENTRATIONS DETECTED IN SOIL SAMPLES  
IN PPM

SOUTH ELM STREET SUNOCO  
GREENSBORO, NORTH CAROLINA  
DUNS NO. 0275-7516

Well No.	Benzene	Toluene	Ethylbenzene	Xylenes	Total BTEX
MW-1	ND	ND	ND	ND	ND
MW-2	16ppb 0.016	33ppb 0.033	7.3ppb 0.0073	42ppb 0.042	98.3ppb 0.0983
MW-3	ND	ND	ND	ND	ND
MW-4	ND	3.1ppb 0.0031	ND	ND	3.1ppb 0.0031
SB-5	ND	ND	ND	ND	ND

ND = Not Detected

ppm = Parts Per Million

Date of Sample Collection - December 2, 1992 (MW-1, MW-2 and MW-4)  
February 8, 1993 (MW-3 and SB-5)

TABLE 3

TPH CONCENTRATIONS DETECTED IN SOIL SAMPLES  
IN PPM

SOUTH ELM STREET SUNOCO  
GREENSBORO, NORTH CAROLINA  
DUNS NO. 0275-7516

Well No.	Total Semi-Volatile Petroleum Hydrocarbons	
	Gas Range	Diesel Range
MW-1	ND	290
MW-2	ND	170
MW-3	ND	ND
MW-4	ND	41
SB-5	ND	ND

ND = Not Detected

ppm = Parts Per Million

Date of Sample Collection - December 2, 1992 (MW-1, MW-2 and MW-4)  
February 8, 1993 (MW-3 and SB-5)

TABLE 4

RESULTS OF FREE PRODUCT GAUGING

SOUTH ELM STREET SUNOCO  
GREENSBORO, NORTH CAROLINA  
DUNS NO. 0275-7516

Well No.	Depth to Free Product	Depth To Ground Water	Thickness of Free Product
MW-2	ND	9.6	ND

Measurements in feet

Date of Water Level Measurements - December 3, 19923

ND = Not Detected

TABLE 5

BTEX CONCENTRATIONS DETECTED IN GROUND-WATER  
IN PPB

SOUTH ELM STREET SUNOCO  
GREENSBORO, NORTH CAROLINA  
DUNS NO. 0275-7516

Well No.	Benzene	Toluene	Ethylbenzene	Xylenes	Total BTEX
MW-2	13	ND	ND	ND	13

ND = Not Detected

ppb = Parts Per Billion

Date of Sample Collection - January 20, 1993

TABLE 6

TPH CONCENTRATIONS DETECTED IN GROUND-WATER  
IN PPB

SOUTH ELM STREET SUNOCO  
GREENSBORO, NORTH CAROLINA  
DUNS NO. 0275-7516

Well No.	Total Semi-Volatile Petroleum Hydrocarbons Gas Range	Diesel Range
MW-2	ND	690

ND = Not Detected

ppb = Parts Per Billion

Date of Sample Collection - January 20, 1993

**FIGURES**



APPROXIMATE SCALE IN FEET



REFERENCE: USGS TOPOGRAPHIC MAP  
GREENSBORO QUADRANGLE  
DATED 1951, PHOTOREVISED 1968



LAW ENGINEERING  
GREENSBORO, NORTH CAROLINA

SITE LOCATION MAP  
SOUTH ELM SUNOCO  
GREENSBORO, NORTH CAROLINA

JOB NO. 259-97516-01

FIGURE 1



APPROXIMATE SCALE IN FEET



REFERENCE: GREENSBORO PLANNING DEPARTMENT  
AERIAL PHOTOGRAPH, SHEET 69  
DATED 1990



LAW ENGINEERING  
GREENSBORO, NORTH CAROLINA

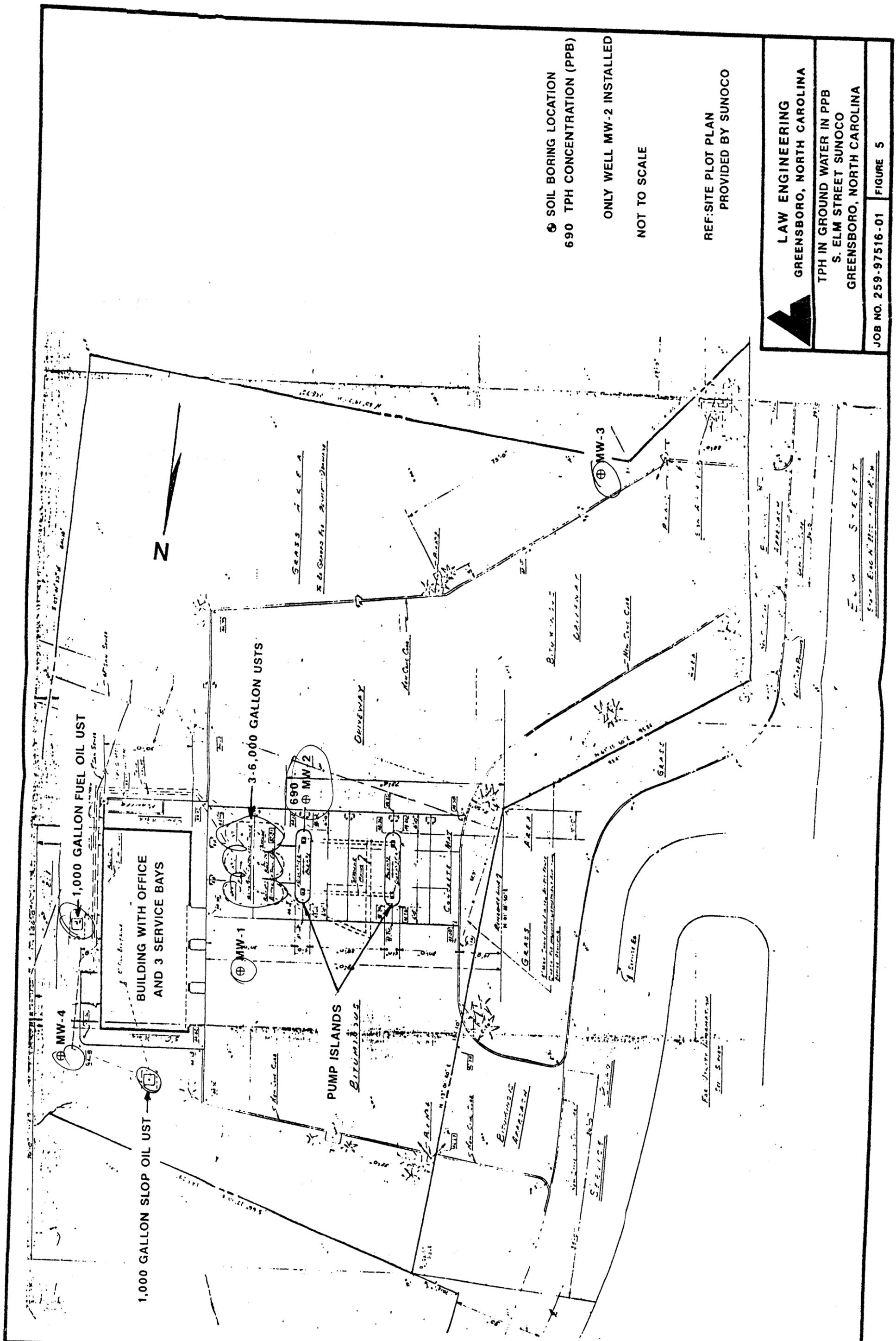
ADJACENT PROPERTIES MAP  
SOUTH ELM SUNOCO  
GREENSBORO, NORTH CAROLINA

JOB NO. 259-97516-01

FIGURE 2







**LAW ENGINEERING**  
 GREENSBORO, NORTH CAROLINA

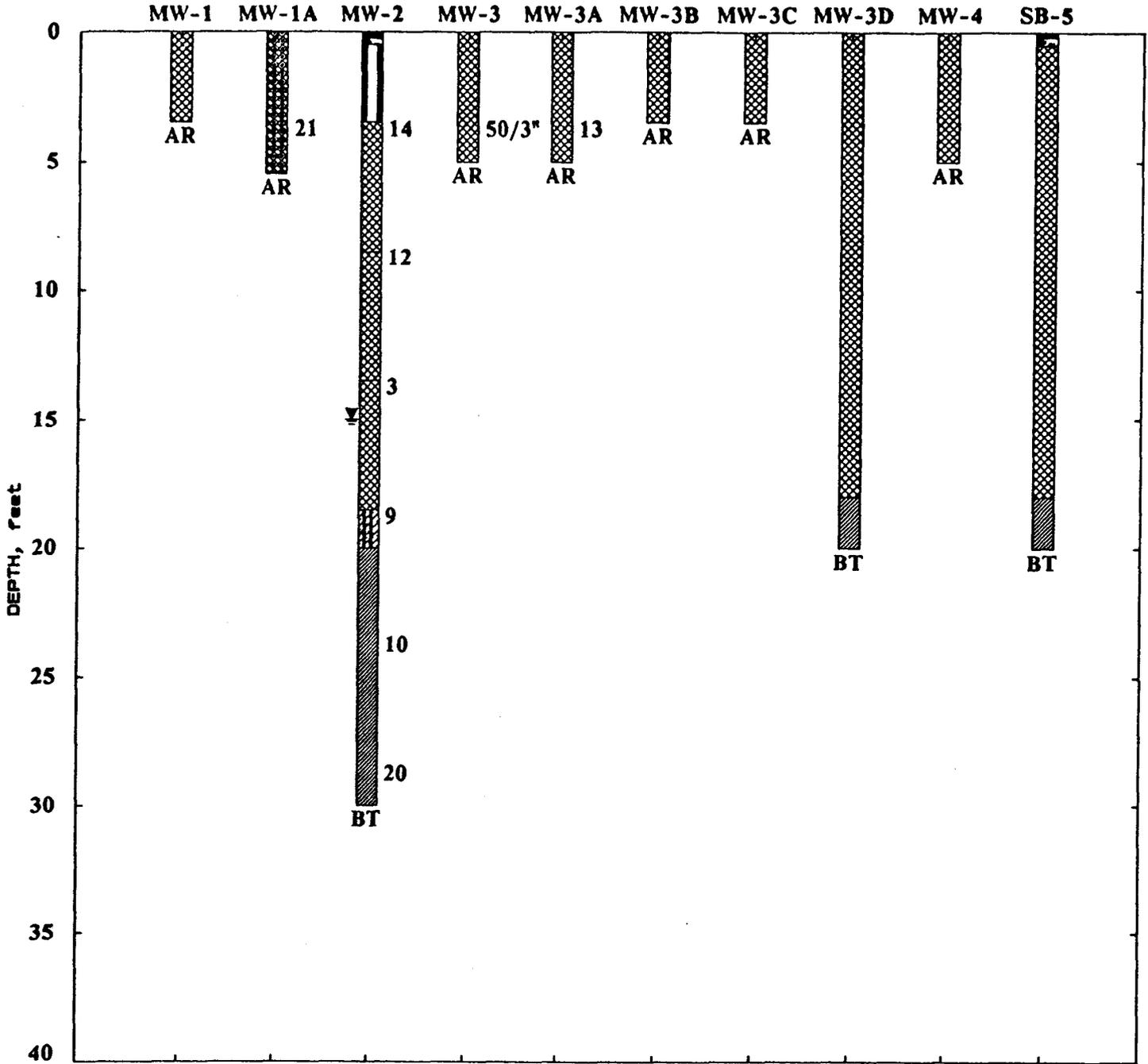
TPH IN GROUND WATER IN PPB  
 S. ELM STREET SUNOCO  
 GREENSBORO, NORTH CAROLINA

JOB NO. 259-97516-01    **FIGURE 5**

ELM STREET  
 S. ELM STREET SUNOCO

**SOIL TEST BORING LOGS**

HORIZONTAL NOT TO SCALE



NOTES:

NUMBERS NEXT TO PROFILES REPRESENT PENETRATION RESISTANCE (BLOWS PER FOOT)

SEE KEY SHEET FOR EXPLANATION OF MATERIAL SYMBOLS

GENERALIZED SUBSURFACE PROFILE	
PROJECT	SOUTH ELM ST. SUNOCO
LOCATION	GREENSBORO, NORTH CAROLINA
LAW JOB NO. 259-97516-01	FIGURE 2
 LAW ENGINEERING	

**CORRELATION OF PENETRATION RESISTANCE  
WITH CONSISTENCY**

NO. OF BLOWS, N	CONSISTENCY	PARTICLE SIZE IDENTIFICATION
SANDS:	0-4	BOULDERS: Greater than 300 mm
	5-10	Very Loose
	11-30	Loose
	31-50	Firm
	OVER 50	Dense
	Very Dense	GRAVEL: Coarse - 19.0 mm to 75 mm Fine - 4.75 mm to 19.0 mm
		SANDS: Coarse - 2.00 mm to 4.75 mm Medium - 0.425 mm to 2.00 mm Fine - 0.075 mm to 0.425 mm
	CONSISTENCY	SILTS & CLAYS: Less than 0.075 mm
SILTS & CLAYS:	0-2	Very Soft
	3-4	Soft
	5-8	Firm
	9-15	Stiff
	16-30	Very stiff
31-50	Hard	NOTE: Numbers next to boring on profile represent standard penetration resistance (blows per foot)
OVER 50	Very Hard	

**KEY TO DRILLING SYMBOLS**

-C- Caved and Wet	▼ Stabilized Water Table	BT Boring Terminated
▣ Split Spoon Sample	▽ Water Table at Time of Drilling	AR Auger Refusal

**KEY TO SOIL CLASSIFICATIONS**

	TOPSOIL
	ASPHALT
	CONCRETE
	GRAVEL
	FILL
	SANDY SILT
	SILT
	PARTIALLY WEATHERED ROCK

DEPTH+  
(FT.)

DESCRIPTION

ELEVATION  
(FT.)

● PENETRATION - BLOWS/FOOT

OVA  
(PPM)

0.0

0

10

20

30

40

60

80

100

CONCRETE, STONE, BRICK AND ORGANICS

3.5

AUGER REFUSAL AT 3.5 FEET  
DRY AT TIME OF BORING

REMARKS:

TEST BORING RECORD

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

SEE KEY SHEET FOR EXPLANATION OF  
SYMBOLS AND ABBREVIATIONS USED ABOVE

 LAW ENGINEERING

DEPTH+ (FT.)	DESCRIPTION	ELEVATION (FT.)	● PENETRATION - BLOWS/FOOT							OVA (PPM)	
			0	10	20	30	40	60	80		100
0.0	PARTIALLY WEATHERED ROCK - SAMPLED AS ROCK FRAGMENTS (POSSIBLE SHOT ROCK)										
5.5	AUGER REFUSAL AT 5.5 FEET DRY AT TIME OF BORING										21

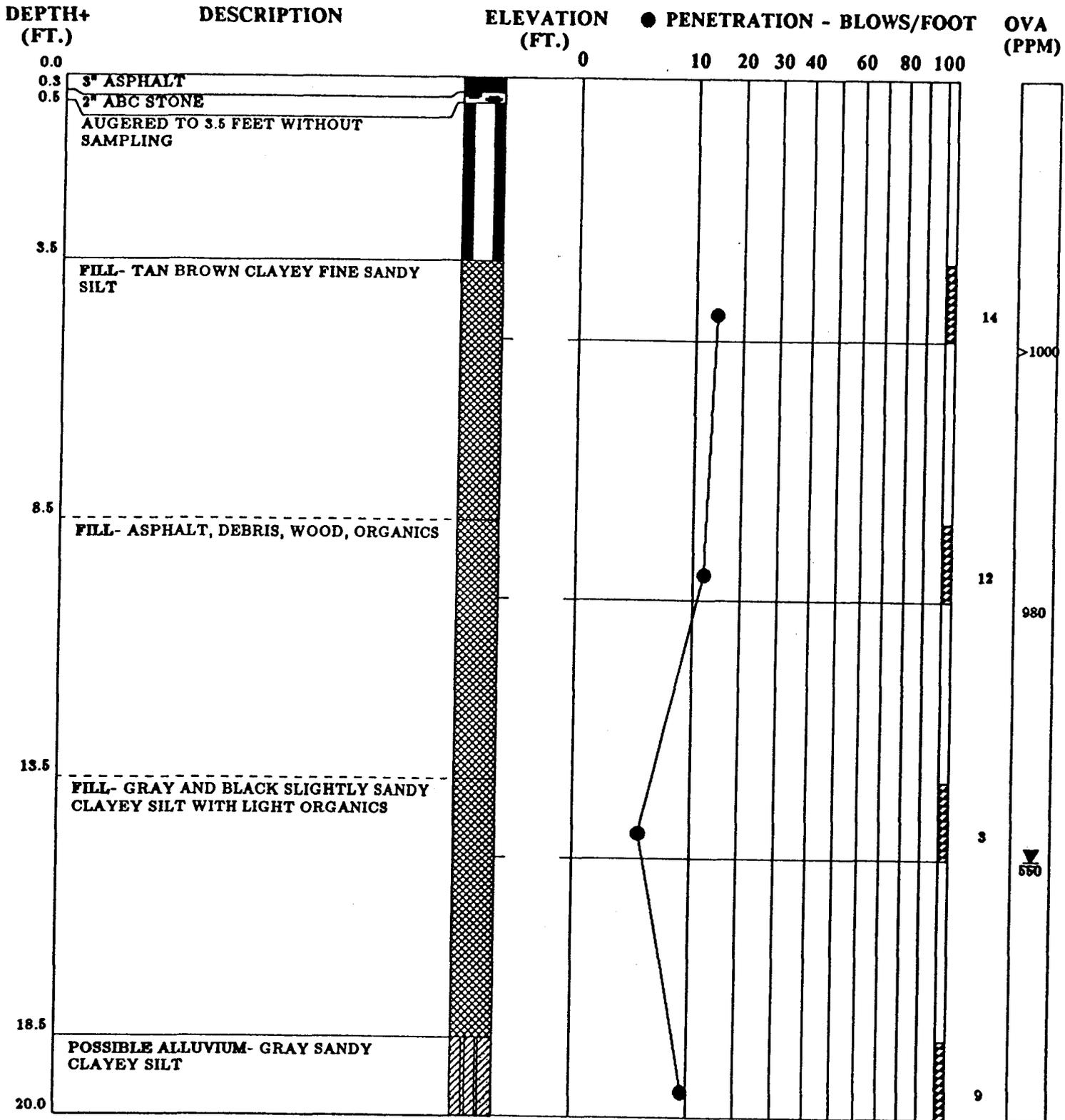
REMARKS:  
MW-1A OFFSET 6 FEET TOWARD STREET

**TEST BORING RECORD**

BORING NUMBER MW-1A  
DATE DRILLED December 1, 1992  
PROJECT NUMBER 259-97516-01  
PROJECT SOUTH ELM ST. SUNOCO  
PAGE 1 OF 1

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

**LAW ENGINEERING**



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

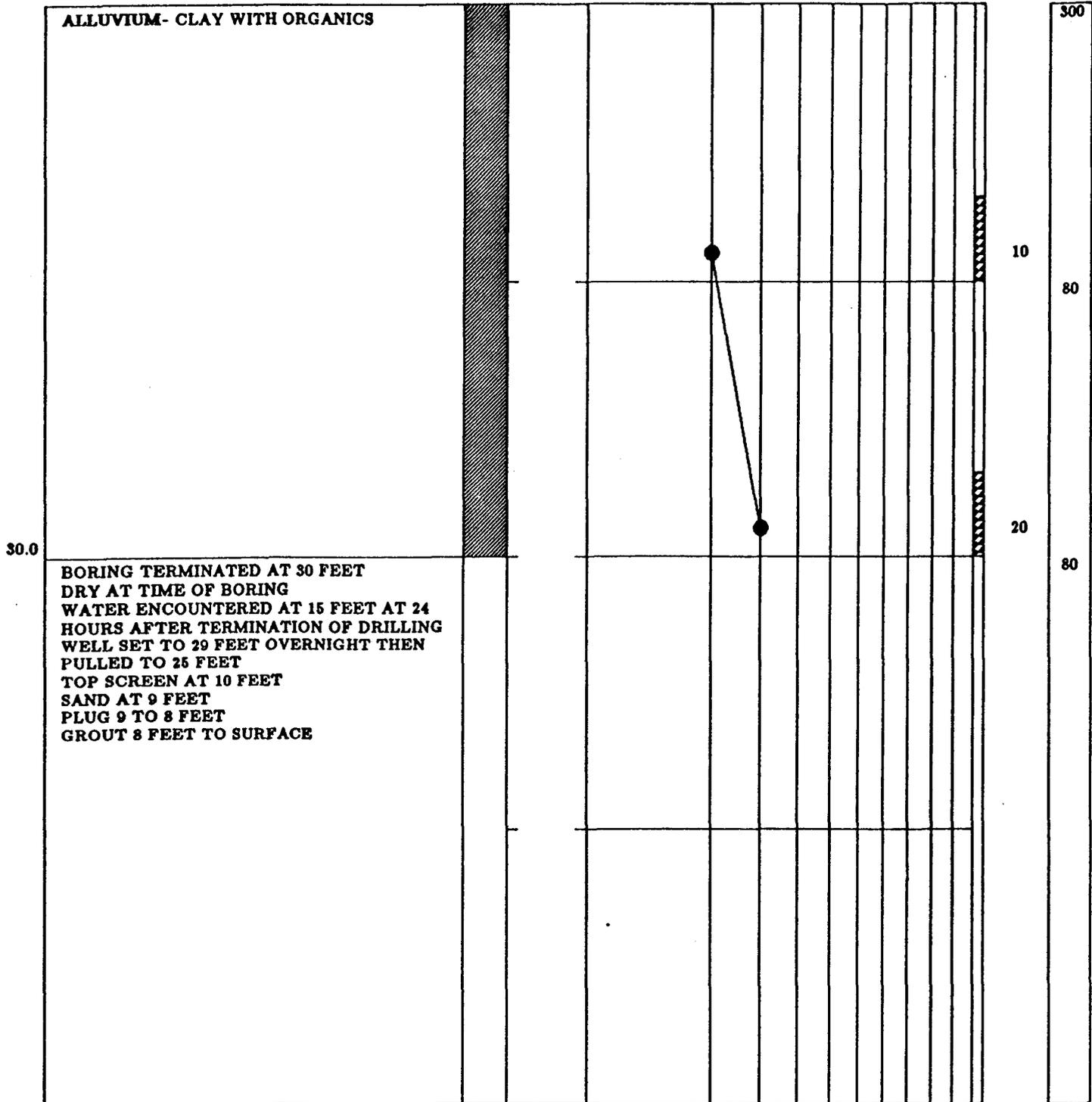
DEPTH+  
(FT.)

DESCRIPTION

ELEVATION  
(FT.)

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

OVA  
(PPM)



30.0

BORING TERMINATED AT 30 FEET  
DRY AT TIME OF BORING  
WATER ENCOUNTERED AT 15 FEET AT 24  
HOURS AFTER TERMINATION OF DRILLING  
WELL SET TO 29 FEET OVERNIGHT THEN  
PULLED TO 25 FEET  
TOP SCREEN AT 10 FEET  
SAND AT 9 FEET  
PLUG 9 TO 8 FEET  
GROUT 8 FEET TO SURFACE

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



DEPTH+ (FT.)	DESCRIPTION	ELEVATION (FT.)	● PENETRATION - BLOWS/FOOT							OVA (PPM)	
			0	10	20	30	40	60	80		100
0.0	CONCRETE AND BRICK										
5.0	AUGER REFUSAL AT 5 FEET DRY AT TIME OF BORING										13

**REMARKS:**

MW-3A OFFSET 5 FEET TO OPPOSITE SIDE OF POLE

TEST BORING RECORD	
BORING NUMBER	MW-3A
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 1 OF 1	
▲ LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

DEPTH+ (FT.)	DESCRIPTION	ELEVATION (FT.)	● PENETRATION - BLOWS/FOOT								OVA (PPM)	
			0	10	20	30	40	60	80	100		
0.0	CONCRETE AND BRICK WITH POSSIBLE COAL											
3.5	AUGER REFUSAL AT 3.5 FEET DRY AT TIME OF BORING											

REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-3B
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 1 OF 1	
▲ LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF  
SYMBOLS AND ABBREVIATIONS USED ABOVE

DEPTH+ (FT.)	DESCRIPTION	ELEVATION (FT.)	● PENETRATION - BLOWS/FOOT							OVA (PPM)	
			0	10	20	30	40	60	80		100
0.0	CONCRETE AND BRICK										
3.5	AUGER REFUSAL AT 3.5 FEET DRY AT TIME OF BORING										

REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-3C
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 1 OF 1	
▲ LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

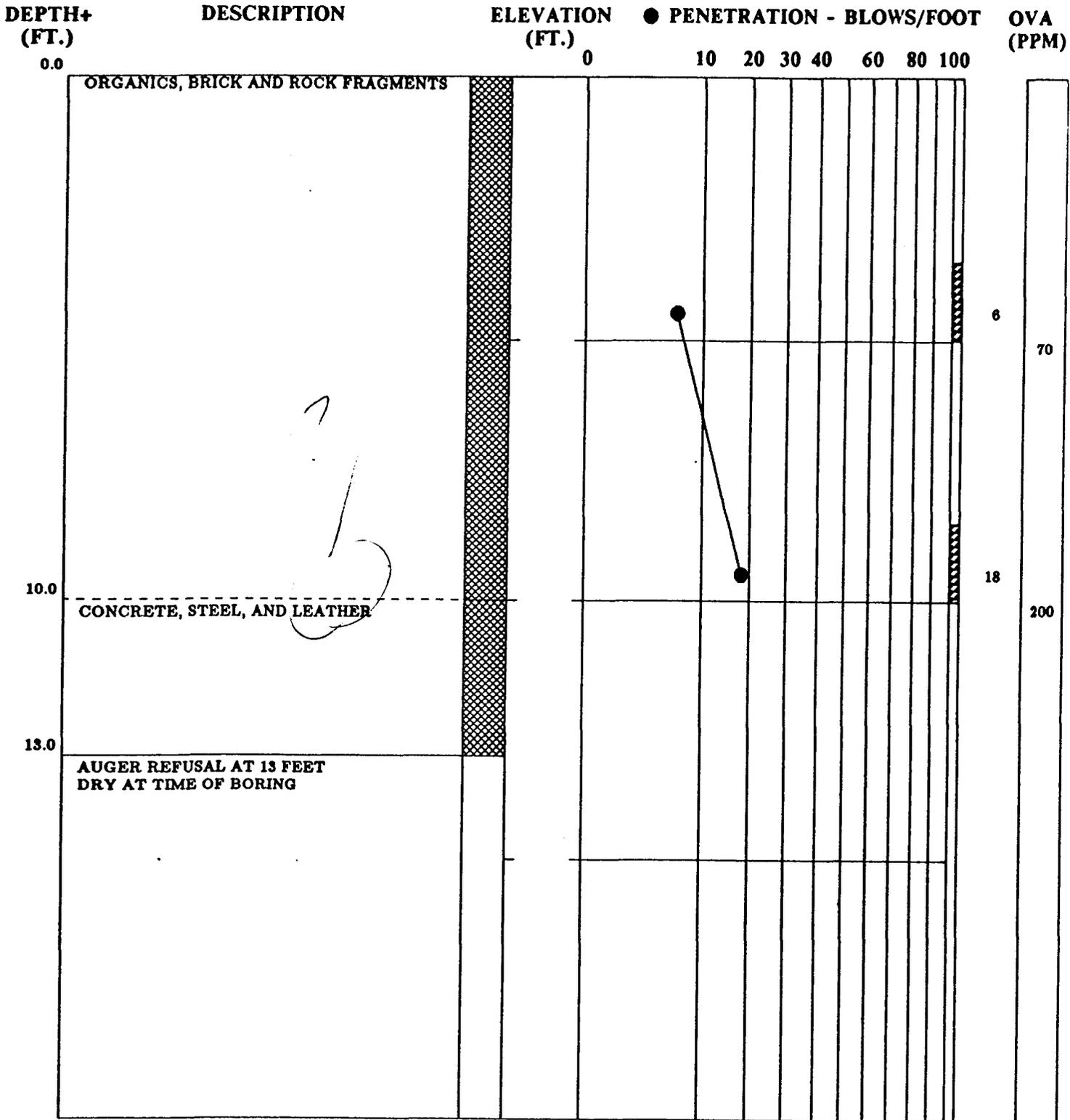


DEPTH+ (FT.)	DESCRIPTION	ELEVATION (FT.)	● PENETRATION - BLOWS/FOOT							OVA (PPM)	
			0	10	20	30	40	60	80		100
0.0	ORGANICS, BRICK AND ROCK FRAGMENTS										
5.0	AUGER REFUSAL AT 5 FEET DRY AT TIME OF BORING										

REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-4
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 1 OF 1	
▲ LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE



REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-4A
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 1 OF 1	
 <b>LAW ENGINEERING</b>	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

DEPTH+ (FT.)	DESCRIPTION	ELEVATION (FT.)	● PENETRATION - BLOWS/FOOT										OVA (PPM)			
			0	10	20	30	40	60	80	100						
0.0	ORGANICS, BRICK AND ROCK FRAGMENTS															
10.0	CONCRETE, STEEL, AND LEATHER															
12.0	AUGER REFUSAL AT 13 FEET DRY AT TIME OF BORING															

REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW-4B
DATE DRILLED	December 1, 1992
PROJECT NUMBER	259-97516-01
PROJECT	SOUTH ELM ST. SUNOCO
PAGE 1 OF 1	
 <b>LAW ENGINEERING</b>	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

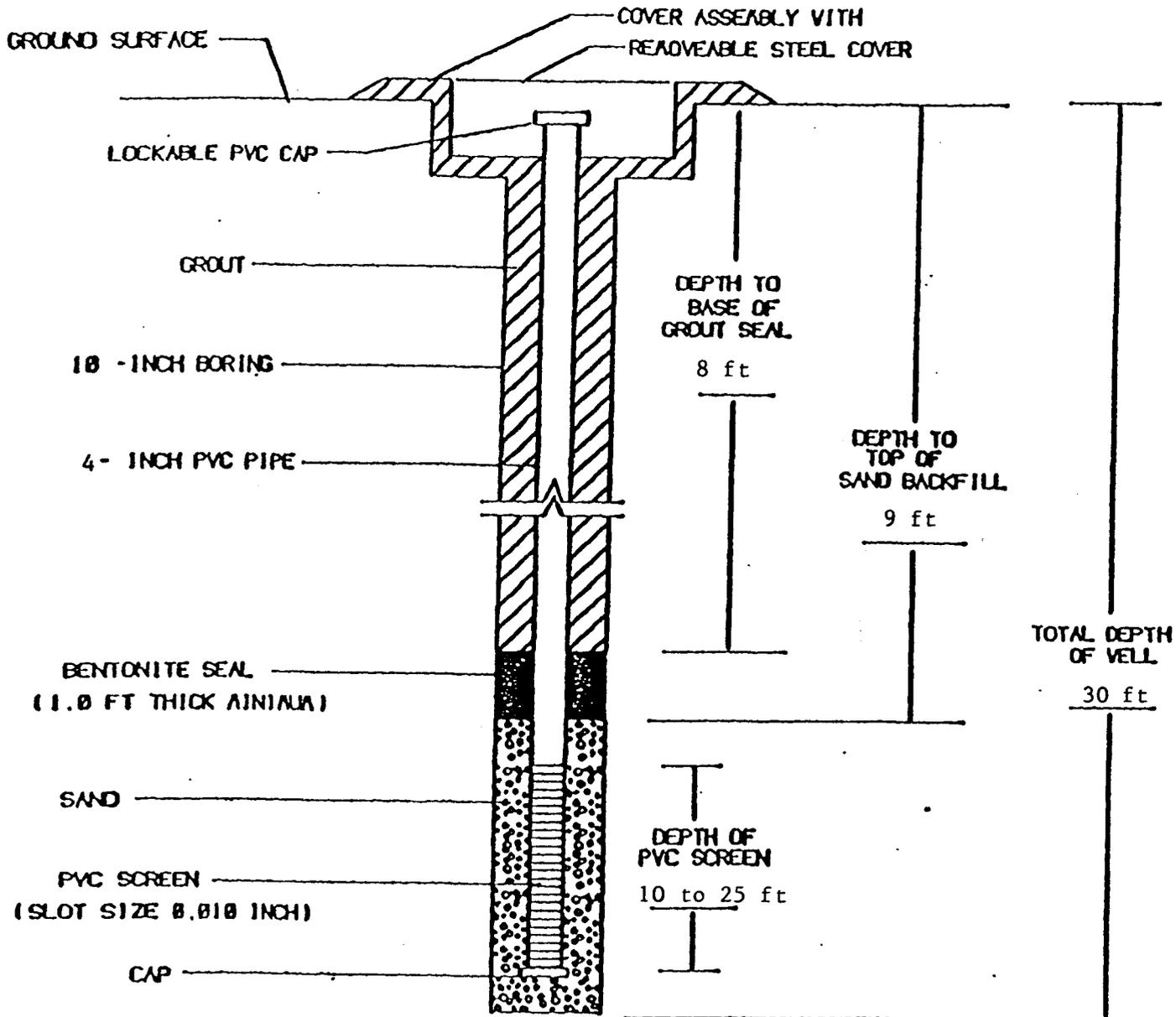


**MONITORING WELL CONSTRUCTION DIAGRAMS**



# 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

**LABORATORY ANALYTICAL DATA REPORTS**



**LAW ENVIRONMENTAL, INC.**

NATIONAL LABORATORIES DIVISION  
300 CHASTAIN CENTER BLVD. SUITE 315  
KENNESAW, GEORGIA 30144  
404-426-4309 FAX 426-0243

December 9, 1992

Law Engineering, Inc.  
7347 J. West Friendly Ave.  
Greensboro, NC 27410

Attention: Scott Veenstra

LE Job Number: 259-97516-01

Subject: Chemical analysis of samples received on 12/03/92.

Dear Mr. Veenstra:

Law Environmental National Laboratories has completed its analysis of your samples and reports the results on the following pages. These results related only to the contents of the samples as submitted. This report shall not be reproduced except in full without the approval of Law Environmental National Laboratories.

If there are any questions, please do not hesitate to contact us.

Sincerely,

LAW ENVIRONMENTAL NATL LABS

Linda Harris  
Hydrocarbon Laboratory Supervisor

Attachment: Data Report  
Invoice

LAW ENVIRONMENTAL NATIONAL LABORATORIES  
TEST DATA REPORT

Date 12/10/92  
Page 1

--- Project Information ---

Lab Number : 62-6030-01  
Project No. : 259-97516-01  
Project Name : SUNOCO

Cust. No. :

Manager: SCOTT VEENSTRA

--- Sample Information ---

Station ID : MW-1-5ft.  
Matrix : SO  
Type : GRAB  
Collector : RE

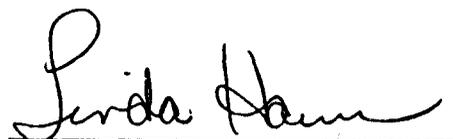
Sampled Date/Time : 12/02/92 12:30  
Received Date/Time : 12/03/92 10:45  
Received From/By : RE/ST  
Chain of Custody : 17263  
Number of Containers : 2

Remarks : \*THE CHROMATOGRAM IS IN THE RANGE OF DIESEL WITH  
HEAVIER CONSTITUENTS.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Anal
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH Semi-Volatile/So/Son	EPA 3550			NA	12/07/92	JMK
Moisture (Oven Dried @ 105 C)	EPA 160.3M	wt %	1	14	12/08/92	RO
--- SERIES 15000						
Benzene	EPA 8020	mg/kg	.002	ND	12/08/92	RO
Toluene	EPA 8020	mg/kg	.002	ND	12/08/92	RO
Ethylbenzene	EPA 8020	mg/kg	.002	ND	12/08/92	RO
Xylene, Total	EPA 8020	mg/kg	.003	ND	12/08/92	RO
-- TPH-Semi-Volatile RESULTS --						
Gas Range	8015M/3550	mg/kg	10	ND	12/08/92	DLM
Diesel Range	8015M/3550	mg/kg	10	290*	12/08/92	DLM
-- SCREENING FOR BTEX RESULTS --						
SCREENING FOR BTEX				NA	12/04/92	OR

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES  
TEST DATA REPORT

Date 12/10/92  
Page 1

--- Project Information ---

Lab Number : 62-6030-02  
Project No. : 259-97516-01  
Project Name : SUNOCO

Cust. No. :

Manager: SCOTT VEENSTRA

--- Sample Information ---

Station ID : MW-2-5ft.	Sampled Date/Time : 12/02/92 14:30
Matrix : SO	Received Date/Time : 12/03/92 10:45
Type : GRAB	Received From/By : RE/ST
Collector : RE	Chain of Custody : 17263
	Number of Containers : 2

Remarks : \*THE CHROMATOGRAM IS IN THE RANGE OF DIESEL WITH HEAVIER CONSTITUENTS.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Anal.
<b>-- SAMPLE PREPARATION RESULTS --</b>						
Ext/TPH Semi-Volatile/So/Son	EPA 3550			NA	12/07/92	JMK
Moisture (Oven Dried @ 105 C)	EPA 160.3M wt %	1		29	12/08/92	RO
<b>--- SERIES 15000</b>						
Benzene	EPA 8020	mg/kg	.007	0.016	12/09/92	RO
Toluene	EPA 8020	mg/kg	.007	0.033	12/09/92	RO
Ethylbenzene	EPA 8020	mg/kg	.007	0.0073	12/09/92	RO
Xylene, Total	EPA 8020	mg/kg	.01	0.042	12/09/92	RO
<b>-- TPH-Semi-Volatile RESULTS --</b>						
Gas Range	8015M/3550	mg/kg	10	ND	12/08/92	DLM
Diesel Range	8015M/3550	mg/kg	10	170*	12/08/92	DLM
<b>-- SCREENING FOR BTEX RESULTS --</b>						
SCREENING FOR BTEX				NA	12/04/92	OR

Signed

*Linda Ham*

LAW ENVIRONMENTAL NATIONAL LABORATORIES  
TEST DATA REPORT

Date 12/10/92  
Page 1

--- Project Information ---

Lab Number : 62-6030-03  
Project No. : 259-97516-01  
Project Name : SUNOCO

Cust. No. :

Manager: SCOTT VEENSTRA

--- Sample Information ---

Station ID : MW-4-13.5ft.  
Matrix : SO  
Type : GRAB  
Collector : RE

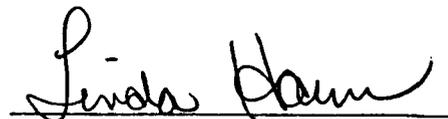
Sampled Date/Time : 12/02/92 16:30  
Received Date/Time : 12/03/92 10:45  
Received From/By : RE/ST  
Chain of Custody : 17263  
Number of Containers : 2

Remarks : \*THE CHROMATOGRAM IS IN THE RANGE OF DIESEL WITH  
HEAVIER CONSTITUENTS.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Anal
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH Semi-Volatile/So/Son	EPA 3550			NA	12/07/92	JMK
Moisture (Oven Dried @ 105 C)	EPA 160.3M	wt %	1	25	12/08/92	RO
--- SERIES 15000						
Benzene	EPA 8020	mg/kg	.002	ND	12/08/92	RO
Toluene	EPA 8020	mg/kg	.002	0.0031	12/08/92	RO
Ethylbenzene	EPA 8020	mg/kg	.002	ND	12/08/92	RO
Xylene, Total	EPA 8020	mg/kg	.004	ND	12/08/92	RO
-- TPH-Semi-Volatile RESULTS --						
Gas Range	8015M/3550	mg/kg	10	ND	12/08/92	DLM
Diesel Range	8015M/3550	mg/kg	10	41*	12/08/92	DLM
-- SCREENING FOR BTEX RESULTS --						
SCREENING FOR BTEX				NA	12/04/92	OR

Signed







LAW ENVIRONMENTAL, INC.  
 NATIONAL LABORATORY  
 300 CHASTAIN CENTER BLVD.  
 SUITE 315  
 KENNESAW, GEORGIA 30144  
 (404) 426-4309

## LAW ENVIRONMENTAL NATIONAL LABORATORIES

### KENNESAW REQUEST FOR ANALYSIS HYDROCARBON LAB

PROJECT NAME: SUNOCO ELM ST COC#: \_\_\_\_\_

PROJECT #: 259-97576 TASK #: 01 PROJECT MGR: SCOTT VEENSTRA

HYDROCARBON (CIRCLE ANALYSES REQUESTED)

TURNAROUND TIME: STANDARD (1 WEEK) X RUSH \_\_\_\_\_ (INCURS RUSH FEE)  
 days

SAMPLE I.D.: MW-1 5 FT  
MW-2 5 FT  
MW-3 13.5 FT

	<u>Water</u>	<u>Water/Soil</u>
BTEX	602	<u>8020</u>
BTEX + MTBE	602	8020
IPE	602	8020
Petroleum Hydrocarbons, IR - EPA 418.1 Oil & Grease	9070	9071 (Soil Only)
Polynuclear Aromatic Hydrocarbons (PAH)	610	8100
Petroleum Hydrocarbons, Volatile - CAL-DHS Petroleum Hydrocarbons, Semi-Volatile - CAL-DHS		
Petroleum Hydrocarbons, Volatile - EPA 5030/8015M Petroleum Hydrocarbons, Volatile - 5030/SF BAY Petroleum Hydrocarbons, Semi-Volatile - 3550/SF BAY		
Petroleum Hydrocarbons, GRO - TENN/5030 Petroleum Hydrocarbons, DRO - TENN		
Petroleum Hydrocarbons, Volatile - IOWA/5030 Petroleum Hydrocarbons, Semi-Volatile - IOWA		
<u>Petroleum Hydrocarbons, Gas/Diesel - EPA 8015M/VA</u>		
Petroleum Hydrocarbons, IR - WTPH-418.1M/WA Petroleum Hydrocarbons, Volatile - WTPH-G/WA Petroleum Hydrocarbons, Semi-Volatile - WTPH-D/WA		

FORM COMPLETED BY: Robert Swan DATE: 12-2-92



LAW ENVIRONMENTAL, INC.

112 TOWNPARK DRIVE  
KENNESAW, GEORGIA 30144-5599  
404-421-3400

February 15, 1993

Law Engineering, Inc.  
7347 J. West Friendly Ave.  
Greensboro, NC 27410

Attention: Scott Veenstra

LE Job Number: 259-97516-01

Subject: Chemical analysis of samples received on 02/09/93.

Dear Mr. Veenstra:

Law Environmental National Laboratories has completed its analysis of your samples and reports the results on the following pages. These results related only to the contents of the samples as submitted. This report shall not be reproduced except in full without the approval of Law Environmental National Laboratories.

If there are any questions, please do not hesitate to contact us.

Sincerely,

LAW ENVIRONMENTAL NATL LABS

*Linda Harris by Dana Smith*

Linda Harris  
Hydrocarbon Laboratory Supervisor

Attachment: Data Report  
Invoice

LAW ENVIRONMENTAL NATIONAL LABORATORIES  
TEST DATA REPORT

Date 02/15/93  
Page 1

--- Project Information ---

Lab Number : 63-6444-01  
Project No. : 259-97516-01  
Project Name : S. ELM ST. SUNOCO

Cust. No. :

Manager: SCOTT VEENSTRA

--- Sample Information ---

Station ID : MW-3  
Matrix : SO  
Type : GRAB  
Collector : SCV

Sampled Date/Time : 02/08/93 13:55  
Received Date/Time : 02/09/93 10:00  
Received From/By : SCV/ST  
Chain of Custody : 14680  
Number of Containers : 2

Remarks :

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Anal.
<b>-- SAMPLE PREPARATION RESULTS --</b>						
Ext/TPH Semi-Volatile/So/Son	EPA 3550			NA	02/11/93	JMK
Moisture (Oven Dried @ 105 C)	EPA 160.3M wt %	1		17	02/14/93	KH
<b>--- SERIES 15000</b>						
Benzene	EPA 8020	mg/kg	.002	ND	02/11/93	OR
Toluene	EPA 8020	mg/kg	.002	ND	02/11/93	OR
Ethylbenzene	EPA 8020	mg/kg	.002	ND	02/11/93	OR
Xylene, Total	EPA 8020	mg/kg	.004	ND	02/11/93	OR
<b>-- TPH-Semi-Volatile RESULTS --</b>						
Gas Range	8015M/3550	mg/kg	10	ND	02/13/93	KH
Diesel Range	8015M/3550	mg/kg	10	ND	02/13/93	KH

Signed *Linda Harris*  
by *Danice Smith*

LAW ENVIRONMENTAL NATIONAL LABORATORIES  
TEST DATA REPORT

Date 02/15/93  
Page 1

--- Project Information ---

Lab Number : 63-6444-02  
Project No. : 259-97516-01  
Project Name : S. ELM ST. SUNOCO  
Cust. No. :  
Manager: SCOTT VEENSTRA

--- Sample Information ---

Station ID : SB-5  
Matrix : SO  
Type : GRAB  
Collector : SCV  
Sampled Date/Time : 02/08/93 15:40  
Received Date/Time : 02/09/93 10:00  
Received From/By : SCV/ST  
Chain of Custody : 14680  
Number of Containers : 2

Remarks :

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Anal
<b>-- SAMPLE PREPARATION RESULTS --</b>						
Ext/TPH Semi-Volatile/So/Son	EPA 3550			NA	02/11/93	JMK
Moisture (Oven Dried @ 105 C)	EPA 160.3M	wt %	1	26	02/14/93	KH
<b>--- SERIES 15000</b>						
Benzene	EPA 8020	mg/kg	.002	ND	02/11/93	OR
Toluene	EPA 8020	mg/kg	.002	ND	02/11/93	OR
Ethylbenzene	EPA 8020	mg/kg	.002	ND	02/11/93	OR
Xylene, Total	EPA 8020	mg/kg	.004	ND	02/11/93	OR
<b>-- TPH-Semi-Volatile RESULTS --</b>						
Gas Range	8015M/3550	mg/kg	10	ND	02/13/93	KH
Diesel Range	8015M/3550	mg/kg	10	ND	02/13/93	KH

Signed

*Linda Harris*  
*641 Daniel Miller*





LAW ENVIRONMENTAL, INC.  
 NATIONAL LABORATORY  
 300 CHASTAIN CENTER BLVD.  
 SUITE 315  
 KENNESAW, GEORGIA 30144  
 (404) 426-4309

**LAW ENVIRONMENTAL  
 NATIONAL LABORATORIES**

**KENNESAW REQUEST FOR ANALYSIS  
 HYDROCARBON LAB**

PROJECT NAME: S. Elm St. Sunoco COC#: 14620

PROJECT #: 259-97516 TASK #: 01 PROJECT MGR: SCOTT VANKSTRA

HYDROCARBON (CIRCLE ANALYSES REQUESTED)

TURNAROUND TIME: STANDARD (1 WEEK)  RUSH  (INCURS RUSH FEE)

SAMPLE I.D.: MW-3, SB-5 days

BTEX  
 BTEX + MTBE  
 IPE

Water	Water/Soil
602	<u>8020</u>
602	8020
602	8020

Petroleum Hydrocarbons, IR - EPA 418.1  
 Oil & Grease

9070 9071 (Soil Only)

Polynuclear Aromatic Hydrocarbons (PAH)

610 8100

Petroleum Hydrocarbons, Volatile - CAL-DHS  
 Petroleum Hydrocarbons, Semi-Volatile - CAL-DHS

Petroleum Hydrocarbons, Volatile - EPA 5030/8015M  
 Petroleum Hydrocarbons, Volatile - 5030/SF BAY  
 Petroleum Hydrocarbons, Semi-Volatile - 3550/SF BAY

Petroleum Hydrocarbons, GRO - TENN/5030  
 Petroleum Hydrocarbons, DRO - TENN

Petroleum Hydrocarbons, Volatile - IOWA/5030  
 Petroleum Hydrocarbons, Semi-Volatile - IOWA

Petroleum Hydrocarbons, Gas/Diesel - EPA 8015M/VA

Petroleum Hydrocarbons, IR - WTPH-418.1M/WA  
 Petroleum Hydrocarbons, Volatile - WTPH-G/WA  
 Petroleum Hydrocarbons, Semi-Volatile - WTPH-D/WA

FORM COMPLETED BY: Scott Vankstra DATE: 2/8/93



**LAW ENVIRONMENTAL, INC.**

112 TOWNPARK DRIVE  
KENNESAW, GEORGIA 30144-5599  
404-421-3400

January 28, 1993

Law Engineering, Inc.  
7347 J. West Friendly Ave.  
Greensboro, NC 27410

Attention: Scott Veenstra

LE Job Number: 259-97516-01

Subject: Chemical analysis of samples received on 01/21/93.

Dear Mr. Veenstra:

Law Environmental National Laboratories has completed its analysis of your samples and reports the results on the following pages. These results related only to the contents of the samples as submitted. This report shall not be reproduced except in full without the approval of Law Environmental National Laboratories.

If there are any questions, please do not hesitate to contact us.

Sincerely,

LAW ENVIRONMENTAL NATL LABS

Linda Harris  
Hydrocarbon Laboratory Supervisor

Attachment: Data Report  
Invoice







LAW ENVIRONMENTAL, INC.  
 NATIONAL LABORATORY  
 300 CHASTAIN CENTER BLVD.  
 SUITE 315  
 KENNESAW, GEORGIA 30144  
 (404) 426-4309

63-6305

**LAW ENVIRONMENTAL  
 NATIONAL LABORATORIES**

**KENNESAW REQUEST FOR ANALYSIS  
 HYDROCARBON LAB**

PROJECT NAME: Sumoco COC#: \_\_\_\_\_

PROJECT #: 259-97516 TASK #: 01 PROJECT MGR: Scott Ueenstra

HYDROCARBON (CIRCLE ANALYSES REQUESTED)

TURNAROUND TIME: STANDARD (1 WEEK)  RUSH \_\_\_\_\_ (INCURS RUSH FEE)  
 days

SAMPLE I.D.: MW-2

	<u>Water</u>	<u>Water/Soil</u>
BTEX	602	8020
BTEX + MTBE	602	8020
IPE	602	8020
Petroleum Hydrocarbons, IR - EPA 418.1 Oil & Grease	9070	9071 (Soil Only)
Polynuclear Aromatic Hydrocarbons (PAH)	610	8100
Petroleum Hydrocarbons, Volatile - CAL-DHS Petroleum Hydrocarbons, Semi-Volatile - CAL-DHS		
Petroleum Hydrocarbons, Volatile - EPA 5030/8015M Petroleum Hydrocarbons, Volatile - 5030/SF BAY Petroleum Hydrocarbons, Semi-Volatile - 3550/SF BAY		
Petroleum Hydrocarbons, GRO - TENN/5030 Petroleum Hydrocarbons, DRO - TENN		
Petroleum Hydrocarbons, Volatile - IOWA/5030 Petroleum Hydrocarbons, Semi-Volatile - IOWA		
<u>Petroleum Hydrocarbons, Gas/Diesel - EPA 8015M/VA</u>		
Petroleum Hydrocarbons, IR - WTPH-418.1M/WA Petroleum Hydrocarbons, Volatile - WTPH-G/WA Petroleum Hydrocarbons, Semi-Volatile - WTPH-D/WA		

FORM COMPLETED BY: Robert Swan DATE: 1-20-93

**MONITORING WELL CONSTRUCTION PERMIT**



Rec'd 12/14/92  
SC

State of North Carolina  
Department of Environment, Health, and Natural Resources  
Winston-Salem Regional Office

James G. Martin, Governor  
William W. Cobey, Jr., Secretary

Margaret Plemmons Foster  
Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT  
GROUNDWATER SECTION

December 8, 1992

Mid-State Oil Company  
c/o SUN  
1835 Market Street 11PC/9  
Philadelphia, PA 19103-2990

SUBJECT: MONITOR WELL CONSTRUCTION  
PERMIT NO. 40-1069-WM-0494  
GUILFORD COUNTY  
FILE NAME: 2903 S. Elm Street - Sunoco

Dear Sir:

In accordance with your application received November 17, 1992, we are forwarding herewith Monitor Well Construction Permit No. 40-1069-WM-0494 for the construction of four monitor wells or more as needed in the Charlotte Belt Hydrogeologic Unit.

Henceforth, correspondence and data relating to these wells shall be designated as specified in the subject heading above.

This Permit will be effective from the date of its issuance and shall be subject to the conditions and limitations as specified therein.

Sincerely,

*Sherri V. Knight*

Sherri V. Knight  
Groundwater Supervisor

LDC/ahl  
Enclosure

cc: Groundwater Section - Central Office  
Guilford County Division of Emergency Management  
WSRO Files  
Law Engineering

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES

PERMIT FOR THE CONSTRUCTION OF

A MONITOR WELL OR WELL SYSTEM

---

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules, and Regulations.

PERMISSION IS HEREBY GRANTED TO

Mid-State Oil Company

---

FOR THE CONSTRUCTION OF FOUR MONITOR WELLS OR MORE AS NEEDED in the Charlotte Belt Hydrogeologic unit located at 2903 S. Elm Street, Greensboro, North Carolina in Guilford County in accordance with the application dated November 13, 1992, and in conformity with the specifications and supporting data, all of which are filed with the Department of Environment, Health and Natural Resources and are considered a part of this Permit.

This Permit is for well construction only, and does not waive any provisions or requirements or any other applicable laws or regulations.

Construction of a well under this Permit shall be in compliance with the North Carolina Well Construction Regulations and Standards, and any other laws and regulations pertaining to well construction.

This Permit will be effective from the date of its issuance until the site assessment has been completed, and shall be subject to other specified conditions, limitations or exceptions as follows:

1. Written permission must be obtained from the property owner prior to construction of the wells.
2. A permanent identification plate with the date of construction, depth of well, screen interval, depth of grout, drilling contractor, and his registration number shall be attached to the well head or the outer protective steel casing.

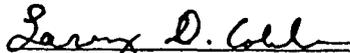
3. The well construction completion form and all water quality data are to be submitted to the Central Office of the Groundwater Section P. O. Box 29535, Raleigh, North Carolina 27611.
4. All laboratory analysis of Groundwater samples collected from the permitted monitor wells are to be submitted to North Carolina Department of Environment, Health, and Natural Resources, Groundwater Section, P. O. Box 29535, Raleigh, N. C. 27611 with a copy to the North Carolina Department of Environment, Health and Natural Resources, Groundwater Section, 8025 North Point Boulevard, Suite 100, Winston-Salem, N. C. 27106 within 60 days of well completion, and quarterly thereafter.
5. All additional investigative findings in relation to the pollution sources being monitored, as indicated under "Additional Information" of form GW-22M ("Item J" of form GW-22B) of permit application, are to be submitted to North Carolina Department of Environment, Health and Natural Resources, Groundwater Section, P. O. Box 29535, Raleigh, N. C. 27611 with a copy to North Carolina Department of Environment, Health, and Natural Resources, Groundwater Section, 8025 North Point Boulevard, Suite 100, Winston-Salem, N. C. 27106 within 60 days of well completion, and quarterly thereafter.
6. The well shall be afforded a means of protection against vandalism, damage, or unauthorized use.
7. When any monitor well is no longer useful for its intended purpose, it shall be abandoned in compliance with North Carolina Administrative Code 15. 2C.0113 and a well abandonment form sent to the North Carolina Department of Environment, Health, and Natural Resources, Groundwater Section, P. O. Box 29535, Raleigh, N. C. 27611 with a copy to North Carolina Department of Environment, Health and Natural Resources, Groundwater Section, 8025 North Point Boulevard, Suite 100, Winston-Salem, N. C. 27106.

Permit No. 40-1069-WM-0494  
Page three

8. The monitor well shall be constructed in accordance with the Groundwater Section's recommended construction details as outlined in attachment #1.
9. A county monitor well construction permit shall be required by the county health departments where applicable. In Forsyth County, contact the Forsyth County Health Department, Division of Environmental Health, P.O. Box 686, Winston-Salem, NC 27102-0686.
10. If additional monitor wells, not shown on the location diagram, need to be constructed, a map showing the proposed location shall be submitted to the Winston-Salem Regional Office, 8025 North Point Blvd., Suite 100, Winston-Salem, NC 27106.

Permit issued this the 8th day of December 1992

FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



---

Larry D. Coble, Regional Supervisor  
Division of Environmental Management

By Authority of the Environmental Management Commission

Permit No. 40-1069-WM-0494