

3
April 14, 1994

State of North Carolina
Department of Environment,
Health and Natural Resources
Winston-Salem Regional Office
Division of Environmental Management
Groundwater Section

Attention: Mr. Larry Coble
Regional Supervisor

Subject: Monarch Hosiery Mills
One Monarch Road
Altamahaw, Alamance County, North Carolina
Groundwater Incident Number PENDING
Law Engineering Job No. 259-00670-01

LAW

ENGINEERING AND ENVIRONMENTAL SERVICES



RECEIVED
N.C. Dept. of ENVIRONMENTAL
HEALTH & NATURAL RESOURCES

APR 22 1994

Winston-Salem
Regional Office

Dear Mr. Coble:

On behalf of Mr. Richard Keziah and Monarch Hosiery Mills, Inc., pleased find enclosed one copy of our Comprehensive Site Assessment report for the subject site. We hope that this report satisfies your requirements.

Additionally, we have submitted a proposal to Monarch Hosiery for the remediation of impacted soils at the site. They have informed me that their decision is forthcoming and as you requested in your letter dated February 15, 1994, we will contact the Winston-Salem Regional Office prior to initiation of remedial activities.

If you have any questions please contact Mr. Steve Gosselin at 910-294-4221.

Sincerely,

Stephen J. Gosselin
Manager, Industrial Environmental Services

cc: Mr. Richard Keziah
Mr. Neil Moore

LAW ENGINEERING, INC.
7347-F WEST FRIENDLY AVENUE
GREENSBORO, NC 27410

910-294-4221
FAX 910-294-4227

ONE OF THE LAW COMPANIES



April 15, 1994

Mr. Richard Keziah
Monarch Hosiery Mills, Inc.
P.O. Box 1205
Burlington, NC 27216

LAW



ENGINEERING AND ENVIRONMENTAL SERVICES

Subject: Comprehensive Site Assessment
Monarch Hosiery Mills Site
Altamahaw, North Carolina
Law Engineering Job No. 259-00670-01

Dear Mr. Keziah:

As authorized by your acceptance of our Proposal No. PGB-253E3 dated March 1, 1994, Law Engineering has prepared a Comprehensive Site Assessment for the subject site. Included in this report is a description of our activities, the results obtained and our conclusions and recommendations.

Law Engineering appreciates the opportunity to serve as your environmental consultant on this project. We will contact you in several days to discuss this report.

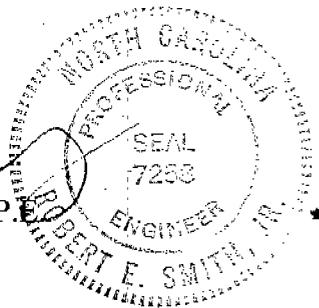
Sincerely,

LAW ENGINEERING, Inc.


Gill D. Gilstrap
Staff Engineer


Stephen J. Gosselin
Project Geologist


Robert E. Smith, Jr., P.E.
Chief Engineer



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APR 22 1994

Winston-Salem
Regional Office

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EXECUTIVE SUMMARY

The site is the Monarch Hosiery manufacturing facility located on Ossipee-Front Street in Altamahaw, North Carolina. Two 10,000 gallon fuel oil underground storage tanks (USTs) previously in use at the facility were removed from the site by United Biotek in May 1993. The USTs were located side-by-side and were removed from the same excavation.

During UST removal activities, field screening of soil samples collected from the floor of the excavation for volatile organic compounds (VOCs; using an HNU) detected a maximum of 65 parts per million (ppm) VOCs. The excavated material was stockpiled on plastic and covered with plastic on site. The excavation was filled with clean fill material.

On March 10 and 11, 1993, six soil borings were drilled and three monitoring wells were installed at the site. Laboratory analyses of ground-water samples detected no contaminants in excess of the State of North Carolina standards. Laboratory analyses of soil samples detected volatile and semi-volatile TPH concentrations in excess of the State of North Carolina standards. Ground water at the site has been calculated to flow to the north with a hydraulic gradient of 0.19 ft/ft. Table 1 lists the soil sample analytical results and Table 2 lists the ground-water sample analytical results. A compilation of the lab analyses performed on soil and water from the site is provided in Appendix 5.

The horizontal and vertical extent of contamination in soil and ground water at the Monarch Hosiery site has been determined. Recommended corrective actions should include excavating the remaining impacted soil from the site and backfilling with clean fill material. Two composite samples of the subsurface material stockpiled during UST removal activities should be collected and analyzed. If laboratory analysis detects TPH levels in excess of State of North Carolina standards, the stockpiled soils and the newly excavated subsurface material should be landfarmed at the site.

SITE HISTORY AND SOURCE CHARACTERIZATION

The Monarch Hosiery manufacturing facility located on Ossipee-Front street in Altamahaw, North Carolina was constructed in 1945 (Figure 2). The property is owned by Monarch Hosiery Mills, Inc. Two 10,000 gallon fuel oil underground storage tanks (USTs) were installed at the site in 1973 and were located in a common basin under a grass cover. An Underground Storage Tank assessment (Report of Environmental Services, Law Engineering Job No. 259-00178-02 report dated March 11, 1992) performed at the site detected volatile and semi-volatile TPH concentrations in excess of the State of North Carolina standards. The USTs were removed on May 20, 1993 by United Environmental Services, Inc. Confirmation soil samples collected from soils beneath the former location of the USTs detected volatile and semi-volatile TPH concentrations above State standards. Contaminated soil was excavated and stockpiled at the site.

On February 15, 1994, the State of North Carolina Department of Environment, Health and Natural Resources Division of Environmental Management (DEM) issued a Notice of Regulatory Requirements of the Oil Pollution and Hazardous Substances Control Act to Monarch Hosiery. Law Engineering was subsequently retained to perform a Comprehensive Site Assessment at the site. On March 10 and 11, 1994, six soil borings and three monitoring wells were installed adjacent to the former location of the USTs (Figure 2). Laboratory analysis of confirmation soil samples detected volatile and semi-volatile TPH concentrations above State standards. Ground-water sample laboratory analysis detected no constituents in excess of State of North Carolina standards.

POTENTIAL RECEPTORS AND MIGRATION PATHWAYS

A water supply well has been identified approximately 500 feet from the former location of the USTs. No surface water intakes have been identified within 0.5 mile of the site. Adjacent property owners are identified in Table 4. No municipal water is available to the site. No artificial conduits are located within 150 feet of the former location of the USTs.

SOILS INVESTIGATION

The site is located within the Carolina Slate Belt of the Piedmont Physiographic Province. The Geologic Map of North Carolina (1985) indicates that the site is underlain by metamorphosed granitic rock. Six soil borings (SB-1 through SB-6, Figure 2) were advanced using a truck-mounted drill rig adjacent to the former location of the USTs. The site soils are characterized as fill to a depth of approximately 9 feet below grade. The fill was characterized as a soft red to brown clayey silt. Residuum consists of sand and silt to approximately 15 to 18.5 feet below

grade. At approximately 15 to 18.5 feet, a partially weathered rock ($N \geq 100$) was encountered. Generalized subsurface soil profiles are located in Appendix 2.

Six soil samples and one duplicate sample were collected from the borings. Laboratory analysis of the soil samples collected during our investigation detected a maximum concentration of 2500 parts per million (ppm) semi-volatile and 170 ppm volatile TPH in the sample collected from soil boring SB-2 (Figure 2) at a depth of 8.5 feet below grade. These levels are in excess of the State of North Carolina standards of 40 ppm semi-volatile and 10 ppm volatile TPH. The laboratory analytical results for soils samples collected during our investigation are included as Table 1.

GROUNDWATER INVESTIGATION

Three ground-water monitoring wells (MW-1, MW-2 and MW-3, Figure 2) were installed to determine the extent of dissolved-phase hydrocarbons in ground water beneath the site. The approximate depth to ground water from surface was measured to be from 4.97 to 5.63 feet in the wells. Depth to ground water in the monitoring wells was measured from a relative datum of 100 feet at MW-1. An average horizontal hydraulic gradient of 0.019 ft/ft was calculated from MW-1 to MW-3. The direction of groundwater flow was determined to be to the north. Details of these calculations are included in Appendix 6. Figure 4 is a ground-water contour map and Figure 5 shows the estimated ground-water flow direction.

Laboratory analysis of ground-water samples collected from monitoring wells MW-1 through MW-3 detected a maximum concentration of 0.0011 ppm ethylbenzene and 0.017 ppm total xylenes. These results are below the State of North Carolina standards of 0.029 ppm for ethylbenzene and 0.53 for xylenes. The laboratory analytical results for ground-water samples collected during our investigation are included as Table 2.

0.0018 (mw-2 Depth) (mw-3)

CONCLUSIONS AND RECOMMENDATIONS

The horizontal and vertical extent of contamination in soil and ground water at the Monarch Hosiery site has been determined. Recommended corrective actions should include excavating the remaining impacted soil at the site and backfilling with clean fill material. Two composite samples of the subsurface material stockpiled during UST removal activities should be collected and analyzed. If laboratory analysis detects TPH levels in excess of State of North Carolina standards, the stockpiled soils and the newly excavated subsurface material should be landfarmed at the site.

in excess of State standards

A Site Sensitivity Evaluation (SSE) completed for the site is included in Appendix 6. The SSE indicates a target remediation level of 60 ppm volatile and 240 ppm semi-volatile TPH for site soils. If the impacted soils are excavated as shown in Figure 3 the target levels should be attainable for this site.

No further assessment or remediation of the ground water beneath the site is recommended at this time.

TABLES

TABLE 1

LABORATORY ANALYTICAL RESULTS SOIL SAMPLES MONARCH HOSIERY MILLS SITE ALTAMAHAW, NORTH CAROLINA LAW ENGINEERING JOB NO. 259-00670-01						
Sample	Sample Type	Sample Depth	Total Depth of Boring	Volatile TPH in ppm	Semi-Volatile TPH in ppm	Date Collected
SB-1	SO/G	18.5'	24'	ND	ND	03/10/94
SB-2	SO/G	8.5'	14'	170	2500	03/11/94
SB-3	SO/G	8.5'	12'	76	550	03/11/94
SB-4	SO/G	8.5'	12'	77	240	03/11/94
SB-5	SO/G	13.5'	15'	ND	10	03/11/94
SB-6	SO/G	8.5'	12'	ND	ND	03/11/94
Duplicate (SB-5)	SO/G	13.5'	15'	ND	19	03/11/94

SO/G = Soil Sample, Grab
 PPM = Parts Per Million
 ND = Not Detected

TABLE 2

LABORATORY ANALYTICAL RESULTS GROUND-WATER SAMPLES MONARCH HOSIERY MILLS SITE ALTAMAHAW, NORTH CAROLINA LAW ENGINEERING JOB NO. 259-00670-01					
Well #	Benzene in ppm	Toluene in ppm	Ethylbenzene in ppm	Xylenes in ppm	PAHs in ppm
MW-1	ND	ND	ND	ND	ND
MW-2	ND	ND	0.0011	0.0053	ND
MW-3	ND	ND	ND	0.017	ND
Dupe (MW-2)	ND	ND	0.0018	0.087	ND
Trip Blank	ND	ND	ND	ND	NA

PPM = Parts Per Million
 ND = Not Detected
 NA = Not analyzed for this component
 PAHs = Polynuclear aromatic hydrocarbons

0.0087

TABLE 3

PROPERTY OWNERSHIP HISTORY MONARCH HOSIERY MILLS SITE ALTAMAHAW, NORTH CAROLINA LAW ENGINEERING JOB NO. 259-00670-01		
Owner	From	To
Dr. Simpson	Unknown	1945
Altamahaw Hosiery Mill	1945	1971
Monarch Hosiery	1971	Present

TABLE 4

SURROUNDING PROPERTY OWNERS MONARCH HOSIERY MILLS SITE ALTAMAHAW, NORTH CAROLINA LAW ENGINEERING JOB NO. 259-00670-01	
	Virginia Satterfield 2610 Old 87 Elon College, NC 27244
	Judy Ann Cooper 2616 Old 87 Elon College, NC 27244
	William C. & Judy Hicks 2558 Od 87 Elon College, NC 27244
	Harold B. Kernodle 1958 Shirley Drive Burlington, NC 27215

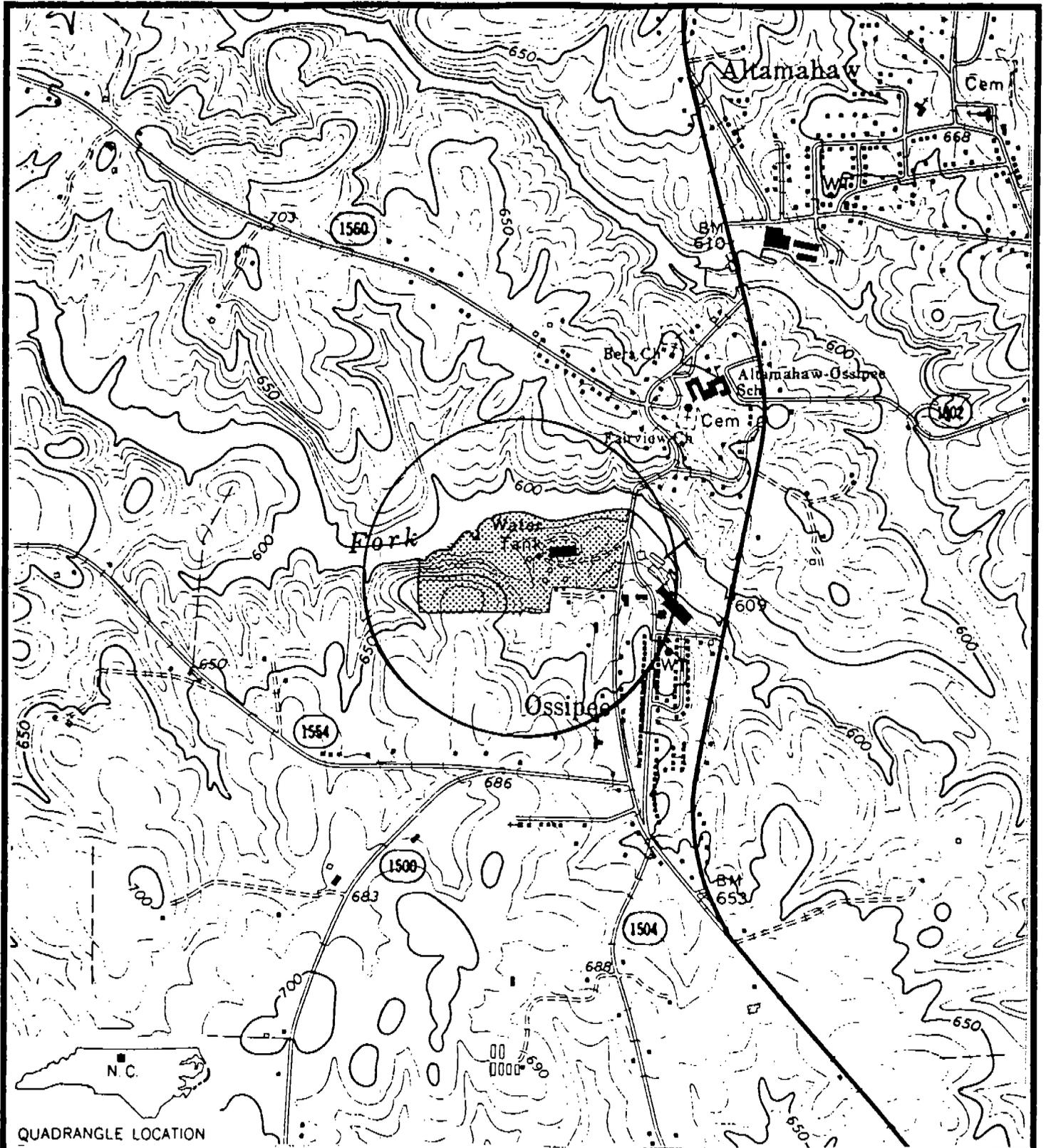
TABLE 5

RESULTS OF OVA SCREENING MONARCH HOSIERY MILLS SITE ALTAMAHAW, NORTH CAROLINA LAW ENGINEERING JOB NO. 259-00670-01		
LOCATION	DEPTH (FEET)	OVA READING (PPM)
SB-1	3.5 to 5	ND
	8.5 to 10	ND
	13.5 to 15	ND
	18.5 to 20	ND
SB-2	3.5 to 5	ND
	8.5 to 10	950
	13.5 to 15	25
SB-3	3.5 to 5	ND
	8.5 to 10	60
SB-4	3.5 to 5	ND
	8.5 to 10	25
SB-5	3.5 to 5	ND
	8.5 to 10	ND
	13.5 to 15	ND
SB-6	3.5 to 5	ND
	8.5 to 10	ND

ND = Not detected

PPM = Part per million

FIGURES



QUADRANGLE LOCATION

 APPROXIMATE SITE LOCATION

APPROXIMATE SCALE



(IN FEET)

REF: U.S.G.S TOPOGRAPHIC MAP
 OSSIPEE N.C. QUADRANGLE
 DATED 1970

TAMPLET/HOS/AR



LAW ENGINEERING, INC.

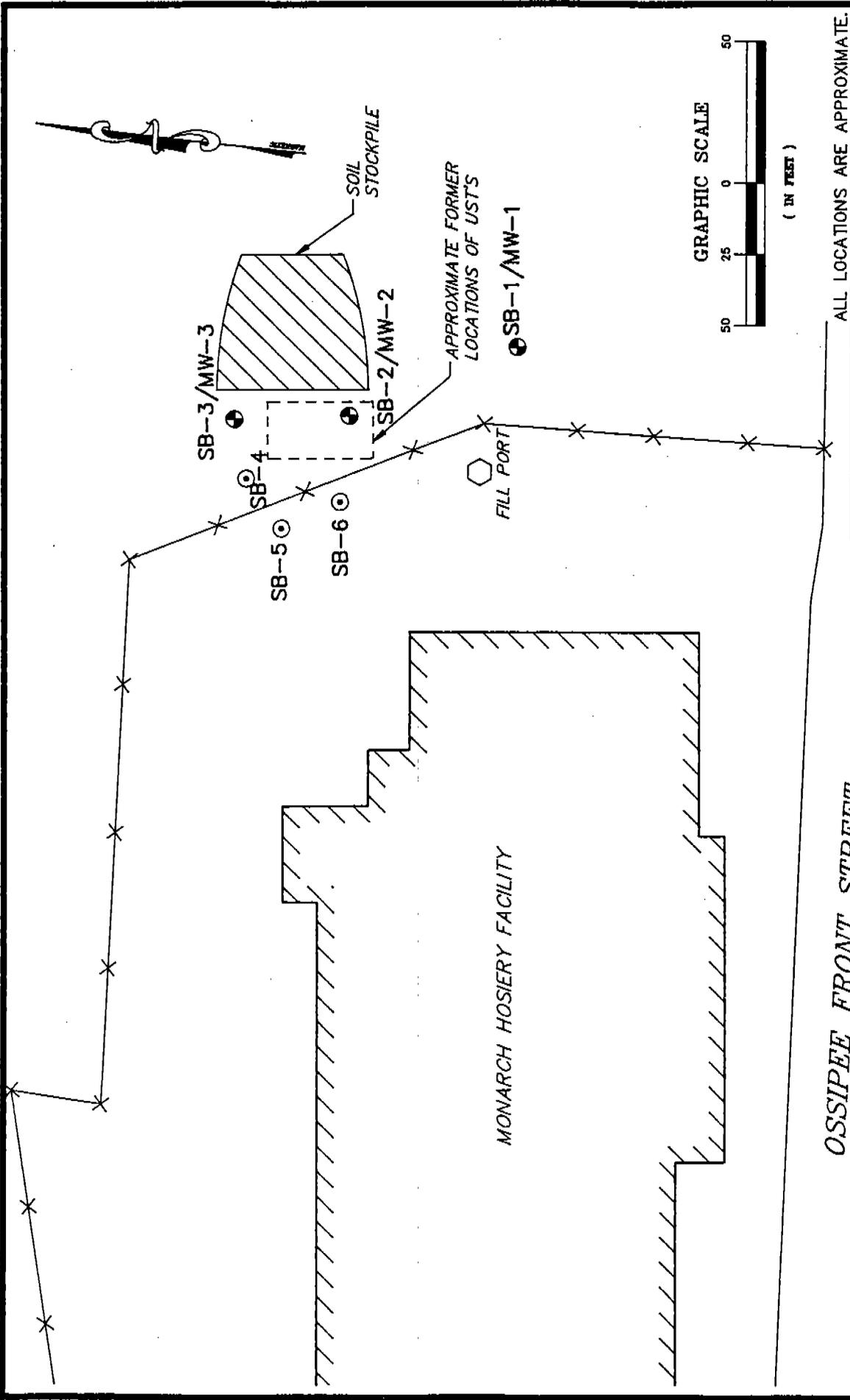
GREENSBORO, NORTH CAROLINA

SITE LOCATION PLAN

MONARCH HOSIERY MILL
 ALTAMAHAW, NORTH CAROLINA

JOB NO. 259-00670-01

FIGURE 1



ALL LOCATIONS ARE APPROXIMATE.

LAW ENGINEERING, INC.
 GREENSBORO, NORTH CAROLINA

SITE PLAN
 MONARCH HOSIERY MILL
 ALTAMAHAW, NORTH CAROLINA

JOB NO. 259-00670-01 FIGURE 2

- LEGEND**
- X — X FENCE LINE
 - SOIL BORING / MONITORING WELL
 - BORING LOCATION

REF: ALAMANCE COUNTY PLANNING DEPARTMENT TOPOGRAPHIC MAP, SHEET NO. A-3, DATED 1970.

ACAD. FILE HOS670/14/AR

LEGEND

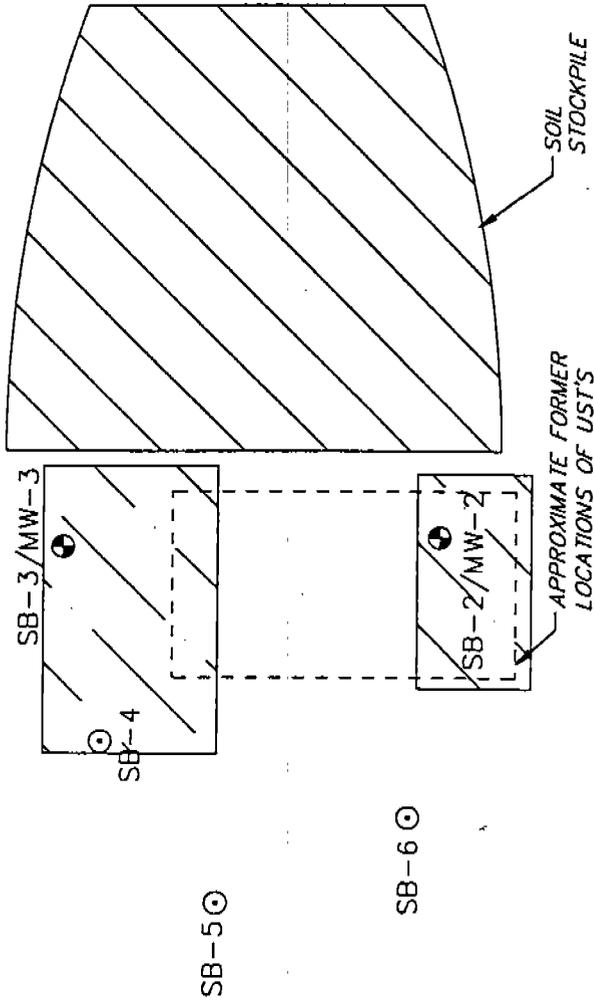
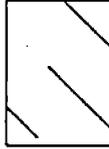


FENCE LINE

SOIL BORING / MONITORING WELL

BORING LOCATION

PROPOSED EXCAVATION



GRAPHIC SCALE



(IN FEET)



FILL PORT

ALL LOCATIONS ARE APPROXIMATE.



LAW ENGINEERING, INC.

GREENSBORO, NORTH CAROLINA

PRELIMINARY EXCAVATION PLAN

MONARCH HOSIERY MILL

ALTAMAHAW, NORTH CAROLINA

JOB NO. 259-00670-01

FIGURE-3

REF: ALAMANCE COUNTY PLANNING DEPARTMENT TOPOGRAPHIC MAP,
SHEET NO A-3, DATED 1970

ACAD FILE: HOS670/PLOT2/14/AR

SB-1/MW-1

SB-5

SB-6

SB-3/MW-3

SB-4

SB-2/MW-2

SOIL STOCKPILE

APPROXIMATE FORMER LOCATIONS OF UST'S

LEGEND



FENCE LINE



SOIL BORING / MONITORING WELL



BORING LOCATION



GROUND-WATER CONTOUR (FT)

92.36

GROUND-WATER ELEVATION (FT)

92

SB-3/MW-3



92.36



SB-4

92.5

SB-5

93

SB-6

93.19



SB-2/MW-2

APPROXIMATE FORMER
LOCATIONS OF UST'S

93.5

SOIL
STOCKPILE

94



FILL PORT

SB-1/MW-1



94.37

94.5



GRAPHIC SCALE



(IN FEET)

ALL LOCATIONS ARE APPROXIMATE.



LAW ENGINEERING, INC.

GREENSBORO, NORTH CAROLINA

GROUND-WATER CONTOUR MAP

MONARCH HOSEYRY MILL

ALTAHAW, NORTH CAROLINA

JOB NO. 259-00670-01 FIGURE 4

REF: ALAMANCE COUNTY PLANNING DEPARTMENT TOPOGRAPHIC MAP,
SHEET NO. A-3, DATED 1970

ACAD FILE HOS670/PLOT2/14/AR

LEGEND



FENCE LINE



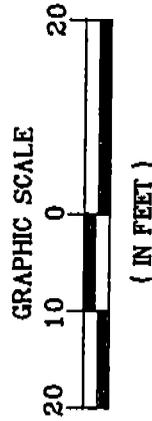
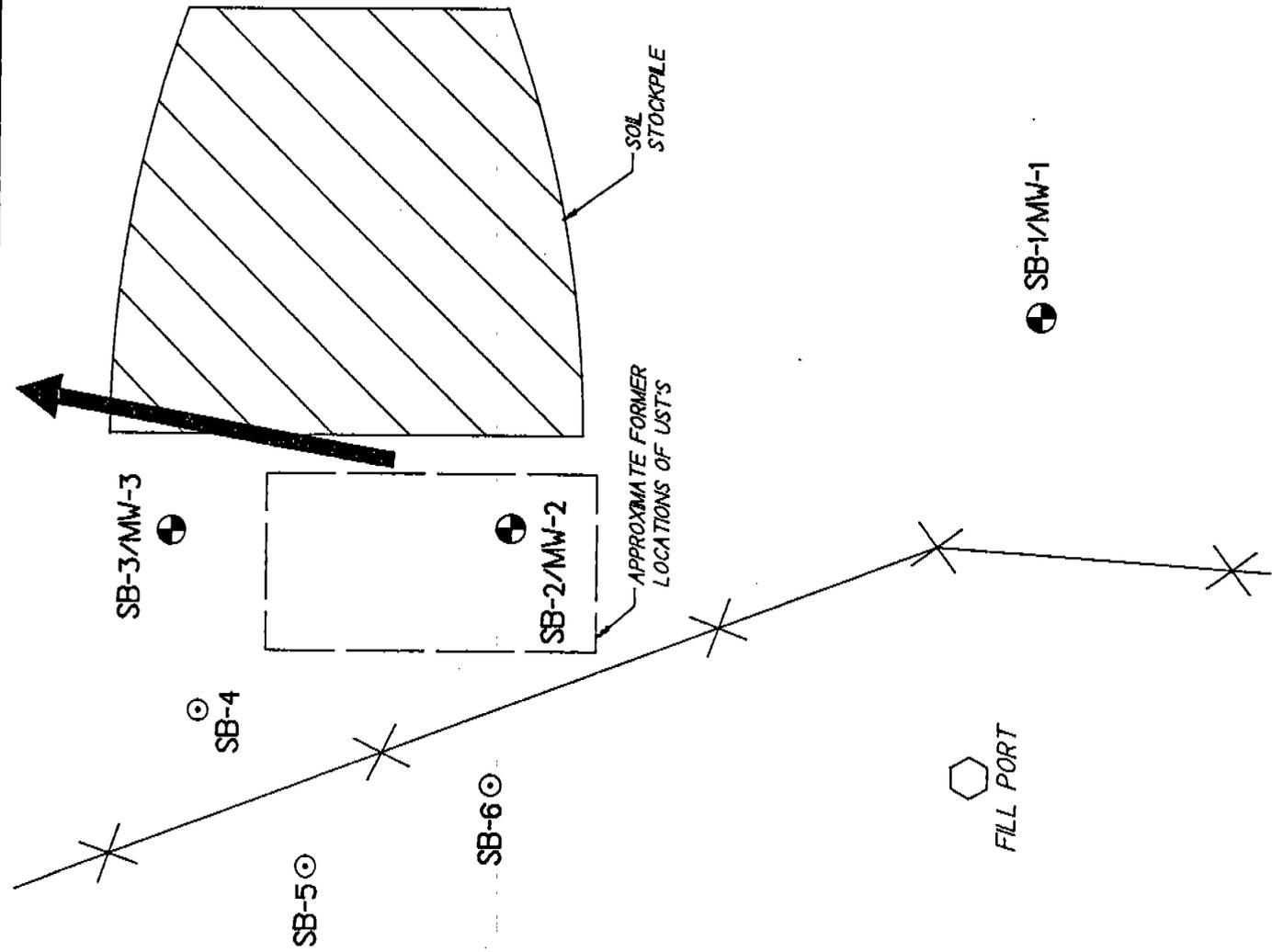
SOIL BORING / MONITORING WELL



BORING LOCATION



ESTIMATED GROUNDWATER FLOW DIRECTION



ALL LOCATIONS ARE APPROXIMATE.

LAW ENGINEERING, INC.
GREENSBORO, NORTH CAROLINA

ESTIMATED GROUNDWATER FLOW DIRECTION
MONARCH HOSEYRY MILL
ALTAMAHAW, NORTH CAROLINA

JOB NO. 259-00670-01

FIGURE 5

ACAD FILE H08870/PP1.0T244/AR

REF: ALAMANCE COUNTY PLANNING DEPARTMENT TOPOGRAPHIC MAP,
SHEET NO A-3, DATED 1970

APPENDIX 1

Standard Field Methods

FIELD METHODS

Listed below are the standard field methods followed in this project.

1. Soil Borings and Sampling

The soil borings were drilled using a truck-mounted drilling rig equipped with 3 1/4-inch I.D. hollow stem augers. To prevent cross contamination, the downhole drilling equipment was steam cleaned prior to commencing drilling activities at each boring. The termination depth of each boring was selected based on the objectives stated in the contracted scope of services.

During drilling, 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 split-spoon samplers were decontaminated prior to each use utilizing high-pressure steam cleaning (with potable water).

The soil sampling methodology was performed in general accordance with ASTM D1586. The split-spoon sampler was first seated six inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows of a 140-pound hammer falling approximately 30 inches. The number of hammer blows required to drive the sampler the final 12 inches was recorded. Representative samples were classified in the field by Law Engineering's on-site field geologist. These samples were screened with an organic vapor analyzer (OVA). Soil Test Boring Records were completed for each boring and are contained in Appendix 2.

Each soil sample was manually collected from split-spoon sampler using new disposable vinyl gloves. The soil samples were then placed into new four-ounce and two-ounce capacity, clean glass containers equipped with teflon-lined screw caps.

After being filled, the sample container was labeled with the job name and number, the time and date of the sample collection, the analyses to be performed, and the absence or presence of preservative. The filled sample containers were placed into a cooler. Zip-lock baggies containing ice were packed around the sample containers in the cooler to maintain the samples at approximately four degrees centigrade.

The Chain of Custody was initiated, at the end of the day, the cooler containing the samples was shipped via overnight express delivery to LENL. The Chain of Custody was maintained as documented in Appendix 4.

2. **OVA Screening**

A representative portion of each soil sample collected from the borings was transferred in to 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 was inserted, and the baggy immediately resealed using finger pressure. The meter of the OVA was monitored and the reading recorded. The OVA readings are presented on the Soil Test Boring Records in Appendix 2 and Table 5.

3. **Monitoring Well Installation**

Three soil borings (SB-1, through SB-3, Figure 2) were converted to monitoring wells with total depths ranging from 19 feet (MW-1) to 12 feet (MW-3) below the ground surface. The wells were installed as Type II ground-water monitoring wells constructed with 2-inch I.D. Schedule 40 PVC flush-threaded casing and screen. The PVC screen and casings were lowered into the open boreholes to the appropriate depths. Either a 10 or 15-foot slotted well screen with machined 0.010-inch slot widths and a threaded bottom plug was installed at the bottom of each well. A solid section of PVC casing was placed above the screened interval at each well and extended to a point just below the ground surface. The annular space around each well was filled with a washed and graded medium sand to approximately one foot above the top of the screen.

A minimum one-half foot thick seal of bentonite pellets was placed immediately above the sand pack. After placement in the well, the bentonite pellets were allowed to hydrate approximately 30 minutes. After hydrating the bentonite pellets, a bentonite/neat cement mixture containing approximately four percent bentonite was pumped down the boreholes to fill the annular space from the bentonite seal to the ground surface. A flush-mounted protective steel cover was installed over each well. Each well was equipped with a lockable, water-tight well plug.

4. **Monitoring Well Development**

Approximately twenty-four hours after installation, the wells were developed by evacuating at least five well volumes, or to dryness twice, using a new one-liter capacity disposable teflon bailer at each location. The wells were developed to remove sand, silt and other fine sediments which may have entered the well during its construction and to develop the sandpack surrounding the wells' screened intervals.

5. Monitoring Well Sampling

Approximately twenty-four hours after development, each well was purged by removing at least five well volumes, or bailing to dryness and allowing recovery to approximately 75 percent of the well's volume. After the purging of a well was completed, ground-water samples were immediately collected from the well. Purging and sampling was accomplished using a new one-liter capacity disposable bailer at each well location. Disposable bailers were utilized to eliminate the necessity of decontaminating bailers prior to sampling each well, and thereby eliminating the possibility of cross contamination.

Immediately after collection, each sample was transferred into three 40 milliliter (ml) capacity clean, and two, one-liter capacity clean glass sample containers equipped with teflon-lined screw caps. The 40 ml sample containers were completely filled with sample to eliminate headspace.

After being filled and sealed, the sample containers were appropriately labeled and placed into protective packing material. The samples were placed into a cooler containing ice. The cooler was then sealed and shipped to LENL. The Chain of Custody was maintained as documented in the Appendix 4.

APPENDIX 2

Boring Logs and Soil Descriptions

KEY TO SOIL CLASSIFICATION

CORRELATION OF STANDARD PENETRATION RESISTANCE WITH CONSISTENCY

NO. OF BLOWS, N	CONSISTENCY
0-4	Very Loose
5-10	Loose
SANDS: 11-30	Firm
31-50	Dense
Over 50	Very Dense

NO. OF BLOWS, N	CONSISTENCY
0-2	Very Soft
3-4	Soft
5-8	Firm
SILTS & CLAYS: 9-15	Stiff
16-30	Very stiff
31-50	Hard
Over 50	Very Hard

INFERRED ORIGIN OF SOIL

RESIDUUM-	Soil Derived From in Place Weathering of Rock
FILL	- Soil Transported and Deposited at Current Location By Man
ALLUVIUM-	Soil Transported and Deposited at Current Location By Water

PARTICLE SIZE IDENTIFICATION

BOULDERS:	Greater than 300 mm
COBBLES:	75 mm to 300 mm
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
SILTS & CLAYS:	Less than 0.075 mm

MODIFIERS

VISUALLY ESTIMATED PERCENT BY WEIGHT

5% TO 12%

12% TO 30%

30% TO 50%

MODIFIER

Slightly Sandy, Slightly Silty, Slightly Clayey

Sandy, Silty, Clayey

Very Sandy, Very Silty, Very Clayey

ROCK CORING SYMBOLS

REC	ROCK CORE RECOVERY
RQD	ROCK QUALITY DESIGNATION

-  Split Spoon Sample
-  Undisturbed Sample
-  Bag Sample
-  Invert Elevation

KEY TO DRILLING SYMBOLS

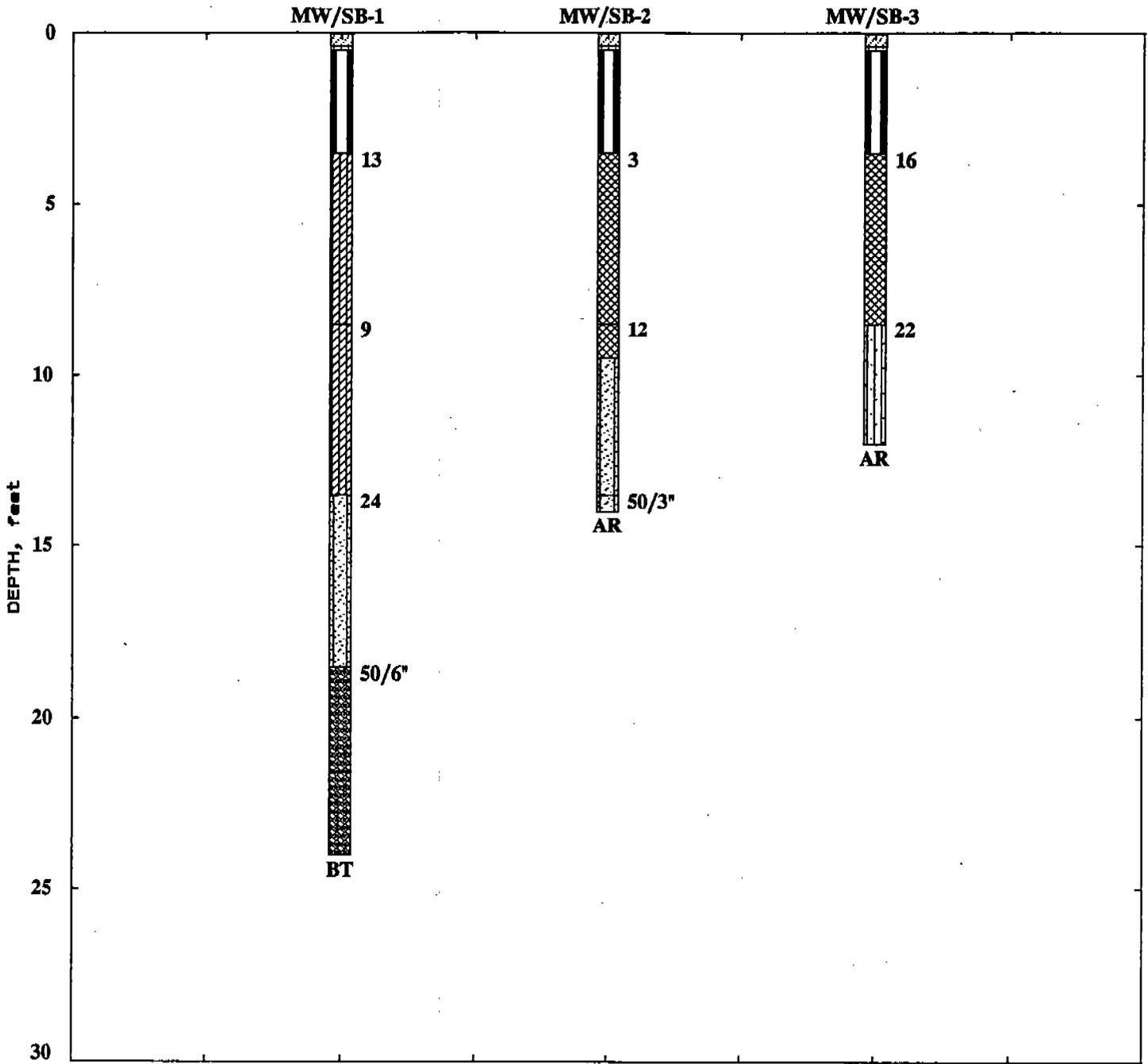
-  Water Level 1 or More Days After Drilling
-  Water Level on Day of Drilling
-  Caved

- BT Boring Terminated
- AR Auger Refusal
- WR Wash Drilling Refusal
- CT Coring Terminated

KEY TO GRAPHICAL SYMBOLS

	TOPSOIL
	AUGERED WITHOUT SAMPLING
	FILL, POSSIBLE FILL
	SANDY SILT
	CLAYEY SILT
	SILTY SAND
	PARTIALLY WEATHERED ROCK

HORIZONTAL NOT TO SCALE



NOTES:

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

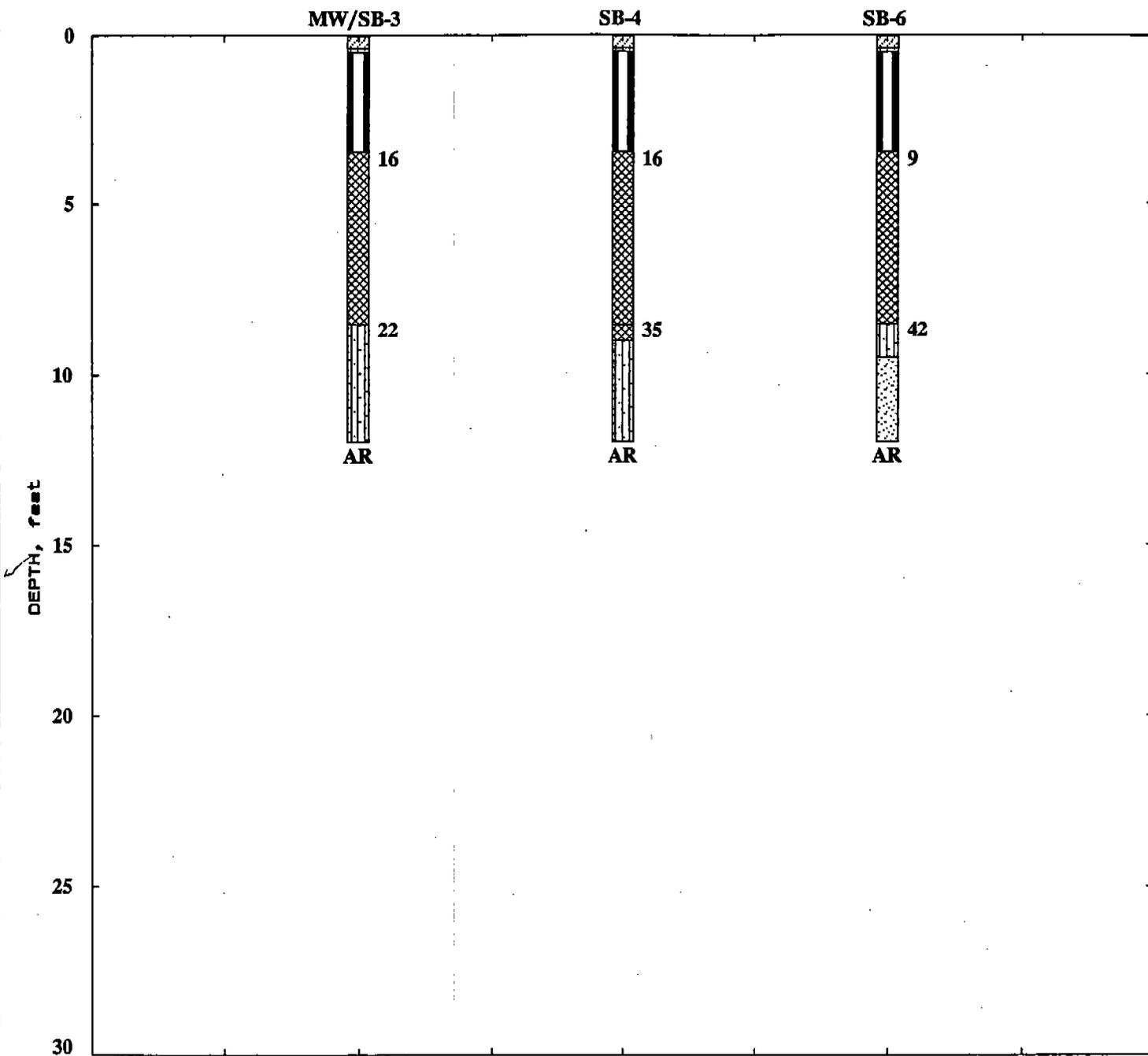
SEE KEY SHEET FOR EXPLANATION OF MATERIAL SYMBOLS

GENERALIZED SUBSURFACE PROFILE

PROJECT MONARCH HOSIERY MILL
LOCATION ALTAMAHAW, NORTH CAROLINA
LAW JOB NO. 259-00670-01

 **LAW ENGINEERING**

HORIZONTAL NOT TO SCALE

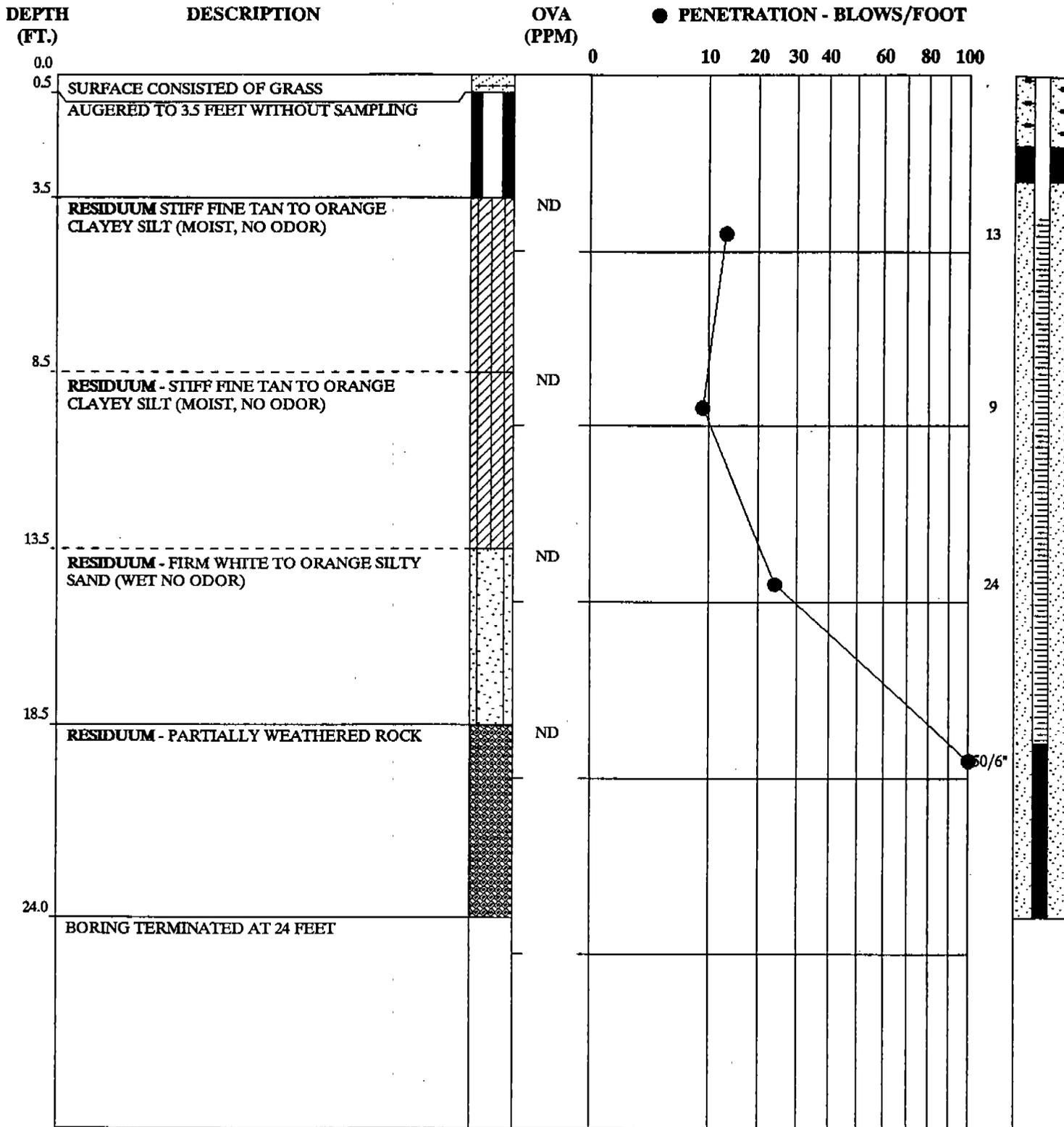


NOTES:

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

SEE KEY SHEET FOR EXPLANATION OF MATERIAL SYMBOLS

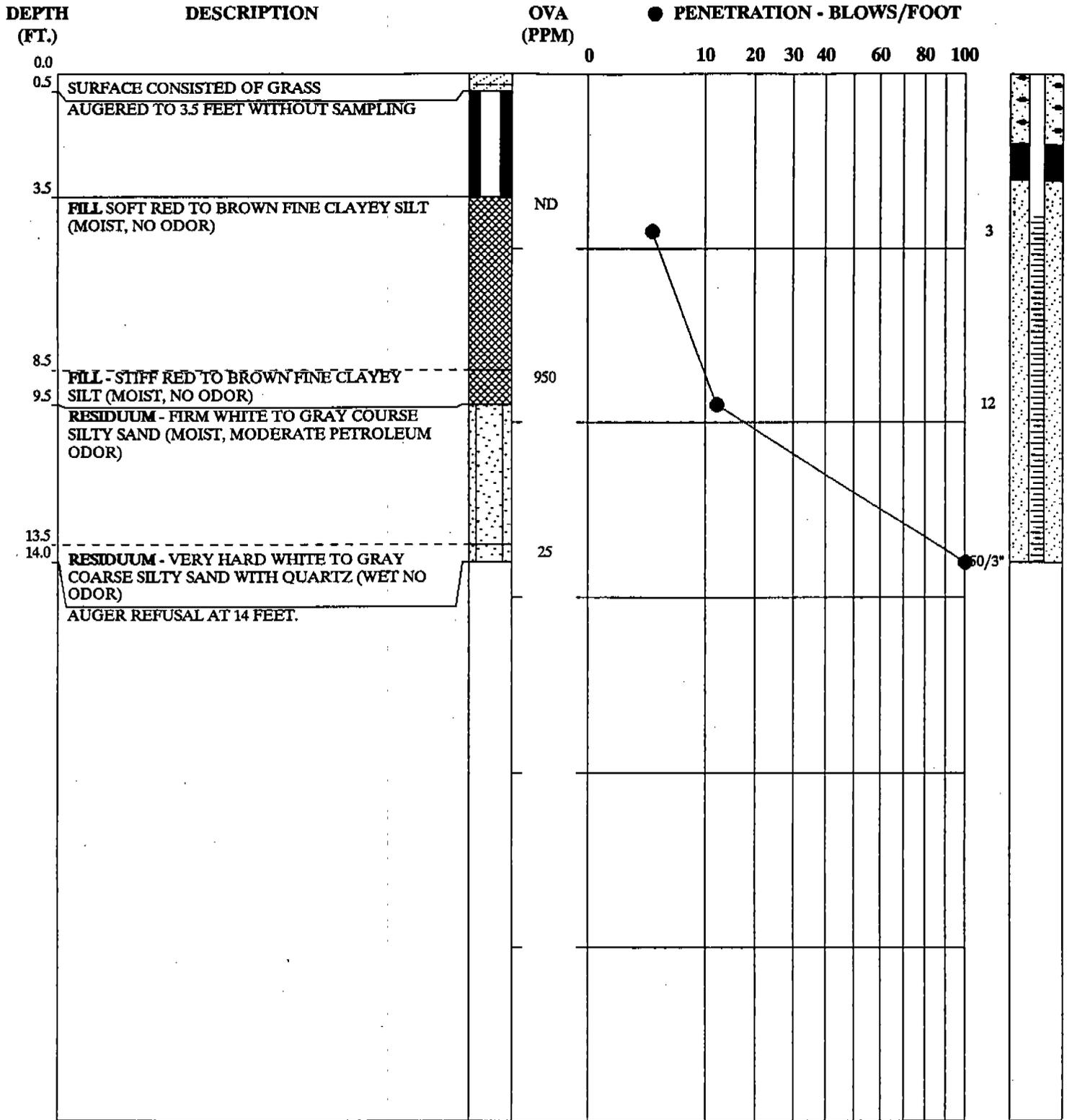
GENERALIZED SUBSURFACE PROFILE	
PROJECT	MONARCH HOSIERY MILL
LOCATION	ALTAMAHAW, NORTH CAROLINA
LAW JOB NO.	259-00670-01
▲ LAW ENGINEERING	



REMARKS:

TEST BORING RECORD	
BORING NUMBER	MW/SB-1
DATE DRILLED	March 10, 1994
PROJECT NUMBER	259-00670-01
PROJECT	MONARCH HOSIERY MILL
PAGE 1 OF 1	
 LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE



REMARKS:

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

TEST BORING RECORD	
BORING NUMBER	MW/SB-2
DATE DRILLED	March 11, 1994
PROJECT NUMBER	259-00670-01
PROJECT	MONARCH HOSIERY MILL
PAGE 1 OF 1	
 LAW ENGINEERING	

DEPTH
(FT.)

DESCRIPTION

OVA
(PPM)

● PENETRATION - BLOWS/FOOT

0 10 20 30 40 60 80 100

0.0

0.5

SURFACE CONSISTED OF GRASS
AUGERED TO 3.5 FEET WITHOUT SAMPLING

3.5

FILL VERY STIFF FINE BROWN CLAYEY SILT
(MOIST, NO ODOR)

ND

16

8.5

RESIDUUM - VERY STIFF FINE GRAY SANDY
SILT (MOIST, MODERATE PETROLEUM ODOR)

60

22

12.0

AUGER REFUSAL AT 12 FEET.

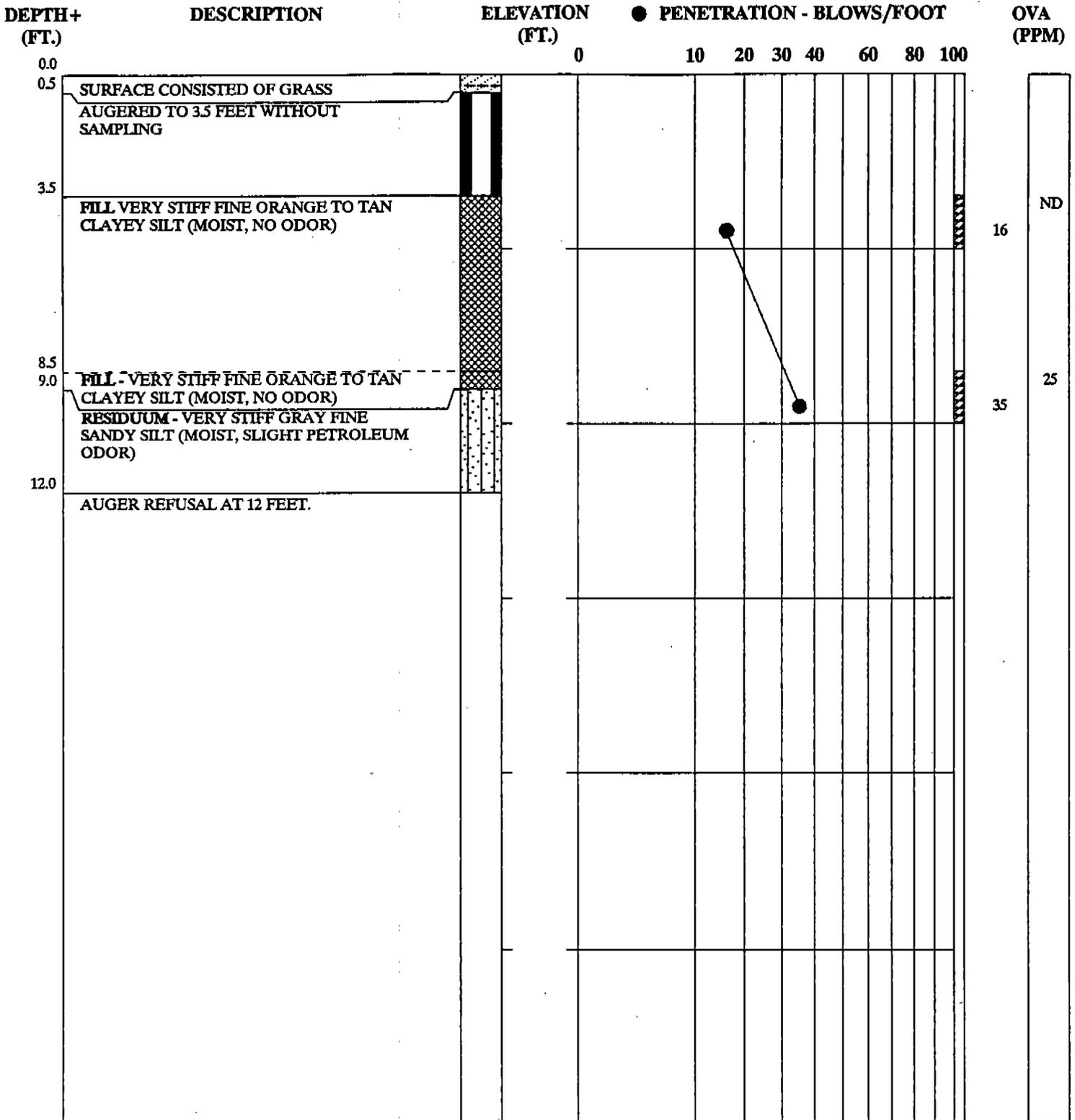
REMARKS:

TEST BORING RECORD

BORING NUMBER	MW/SB-3
DATE DRILLED	March 11, 1994
PROJECT NUMBER	259-00670-01
PROJECT	MONARCH HOSEIERY MILL
PAGE 1 OF 1	

SEE KEY SHEET FOR EXPLANATION OF
SYMBOLS AND ABBREVIATIONS USED ABOVE

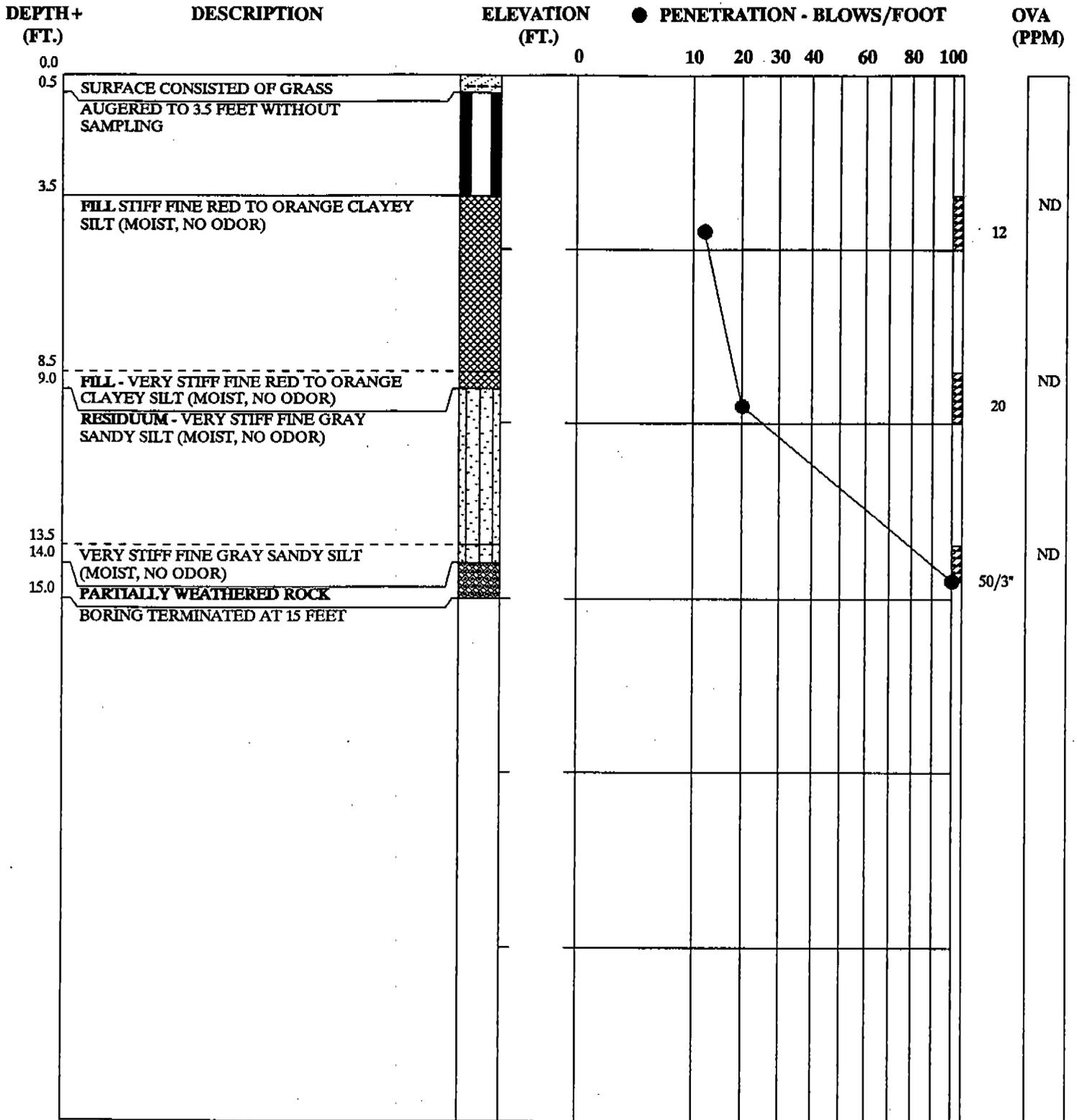
 LAW ENGINEERING



REMARKS:

TEST BORING RECORD	
BORING NUMBER	SB-4
DATE DRILLED	March 11, 1994
PROJECT NUMBER	259-00670-01
PROJECT	MONARCH HOSIERY MILL
PAGE 1 OF 1	
 LAW ENGINEERING	

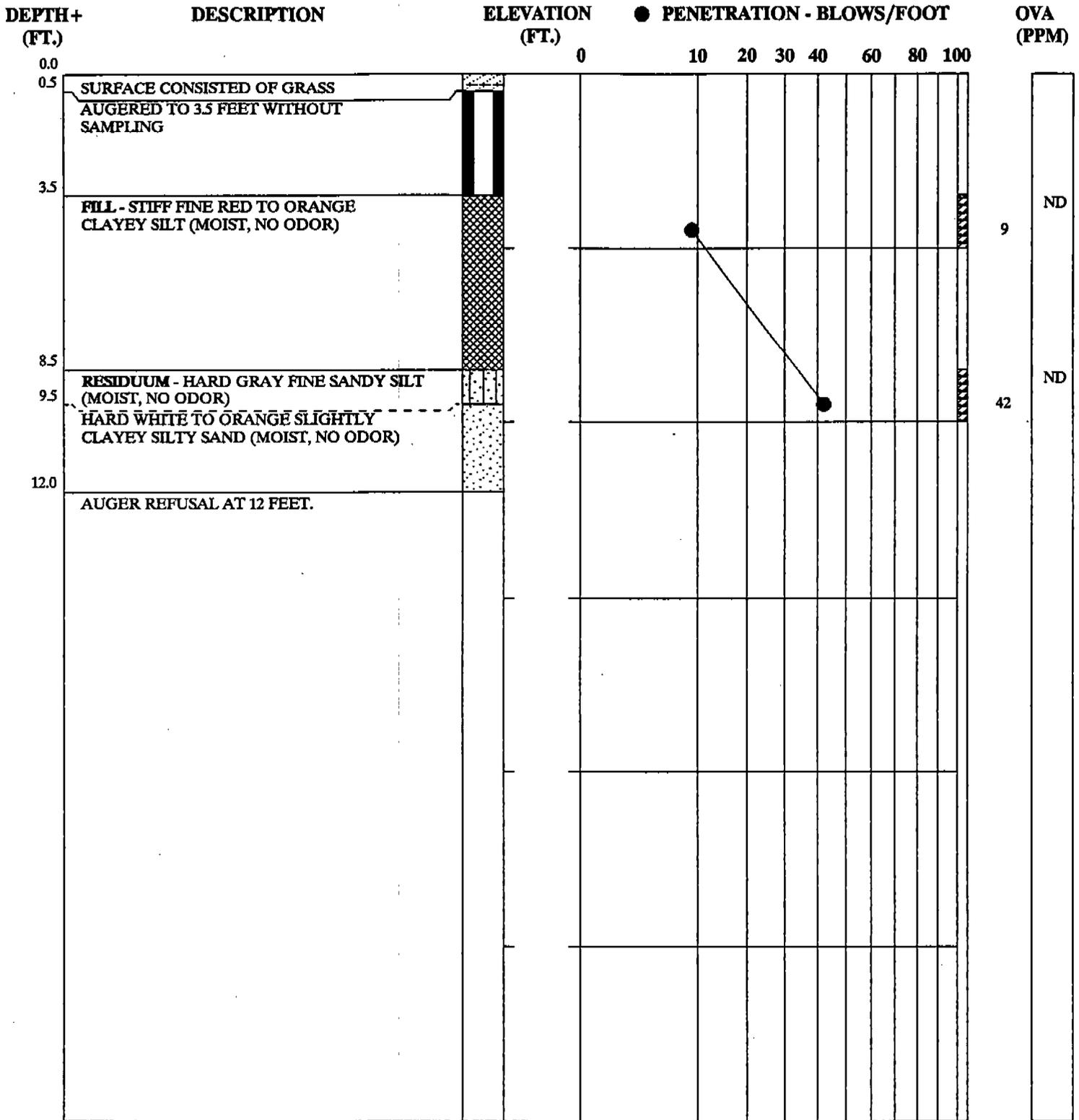
SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE



REMARKS:

TEST BORING RECORD	
BORING NUMBER	SB-5
DATE DRILLED	March 11, 1994
PROJECT NUMBER	259-00670-01
PROJECT	MONARCH HOSIERY MILL
PAGE 1 OF 1	
 LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE



REMARKS:

TEST BORING RECORD	
BORING NUMBER	SB-6
DATE DRILLED	March 11, 1994
PROJECT NUMBER	259-00670-01
PROJECT	MONARCH HOSIERY MILL
PAGE 1 OF 1	
▲ LAW ENGINEERING	

SEE KEY SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED ABOVE

APPENDIX 3

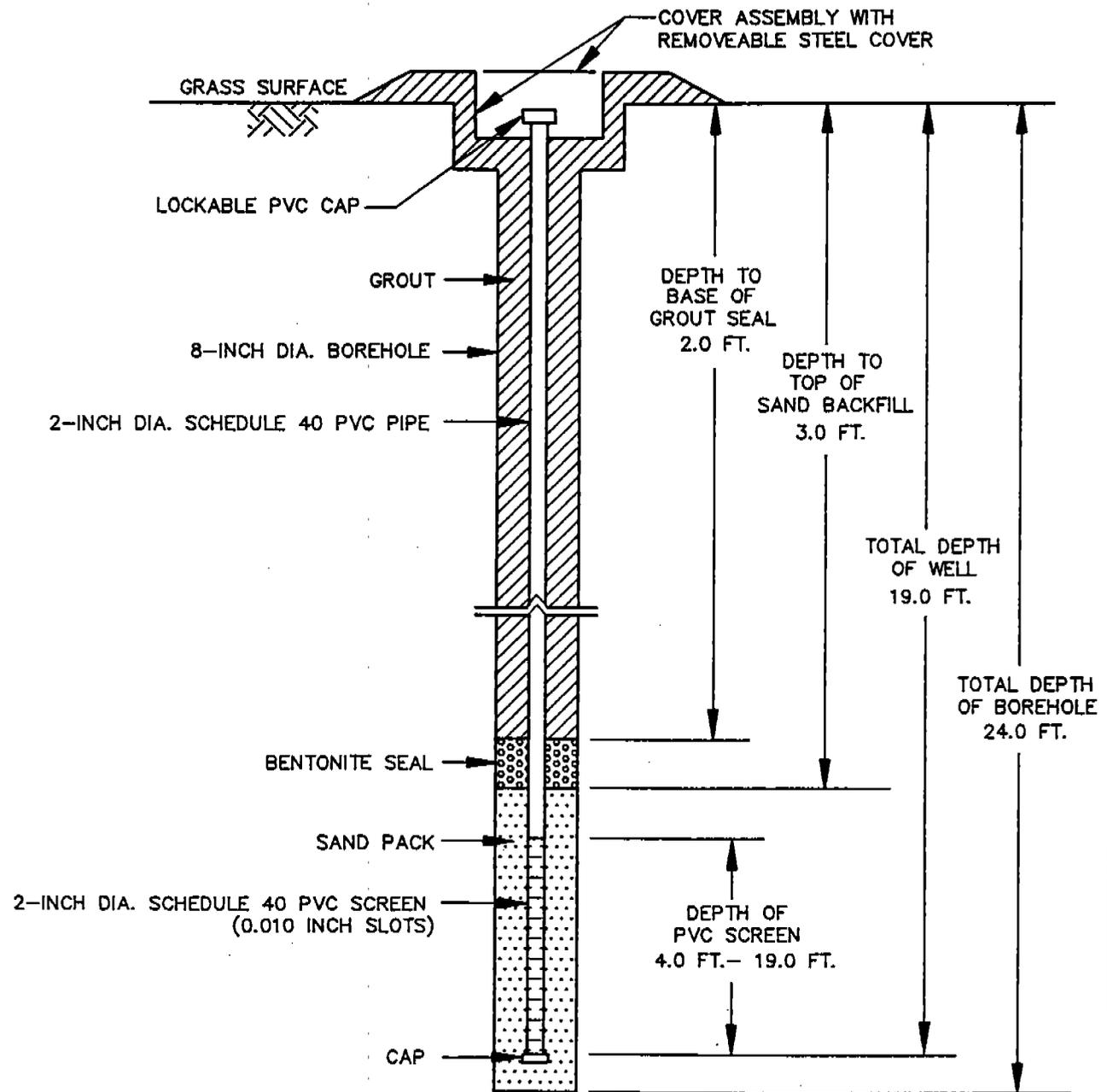
Well Construction Records

JOB NAME MONARCH HOSIERY MILL JOB NUMBER 259-00670-01

WELL NUMBER MW-1/SB-1

LOCATION ALTAMAHAW, NORTH CAROLINA

INSTALLATION DATE 03/10/94



LAW ENGINEERING, INC.

GREENSBORO, NORTH CAROLINA

**GROUND-WATER MONITORING WELL
INSTALLATION RECORD**

MONARCH HOSIERY MILL
ALTAMAHAW, NORTH CAROLINA

NOTE: ALL PVC JOINTS HAVE SCREW CONNECTORS

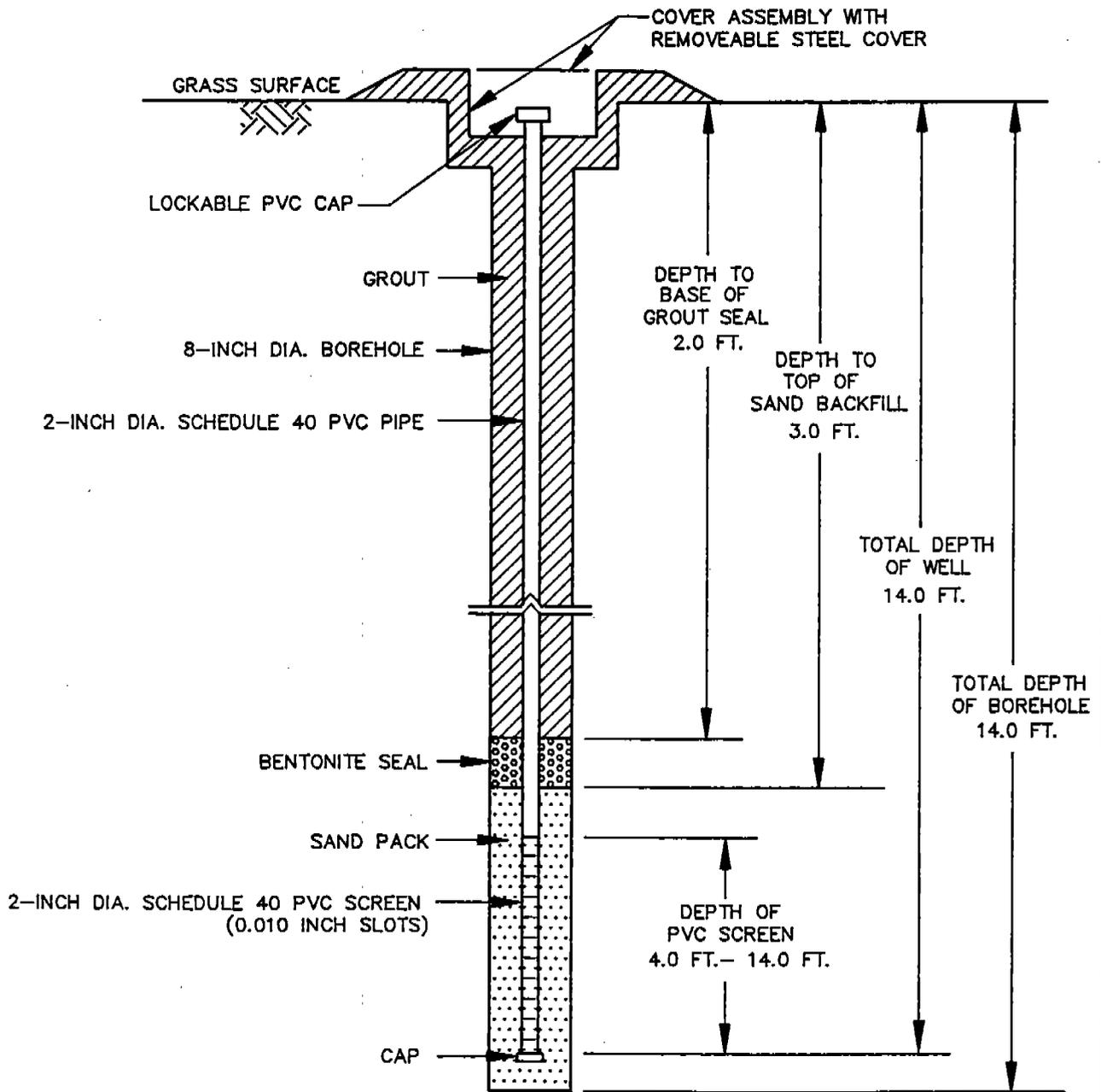
JOB NO. 259-00670-01

JOB NAME MONARCH HOSIERY MILL JOB NUMBER 259-00670-01

WELL NUMBER MW-2/SB-2

LOCATION ALTAMAHAW, NORTH CAROLINA

INSTALLATION DATE 03/11/94



LAW ENGINEERING, INC.

GREENSBORO, NORTH CAROLINA

**GROUND-WATER MONITORING WELL
INSTALLATION RECORD**

MONARCH HOSIERY MILL
ALTAMAHAW, NORTH CAROLINA

NOTE: ALL PVC JOINTS HAVE SCREW CONNECTORS

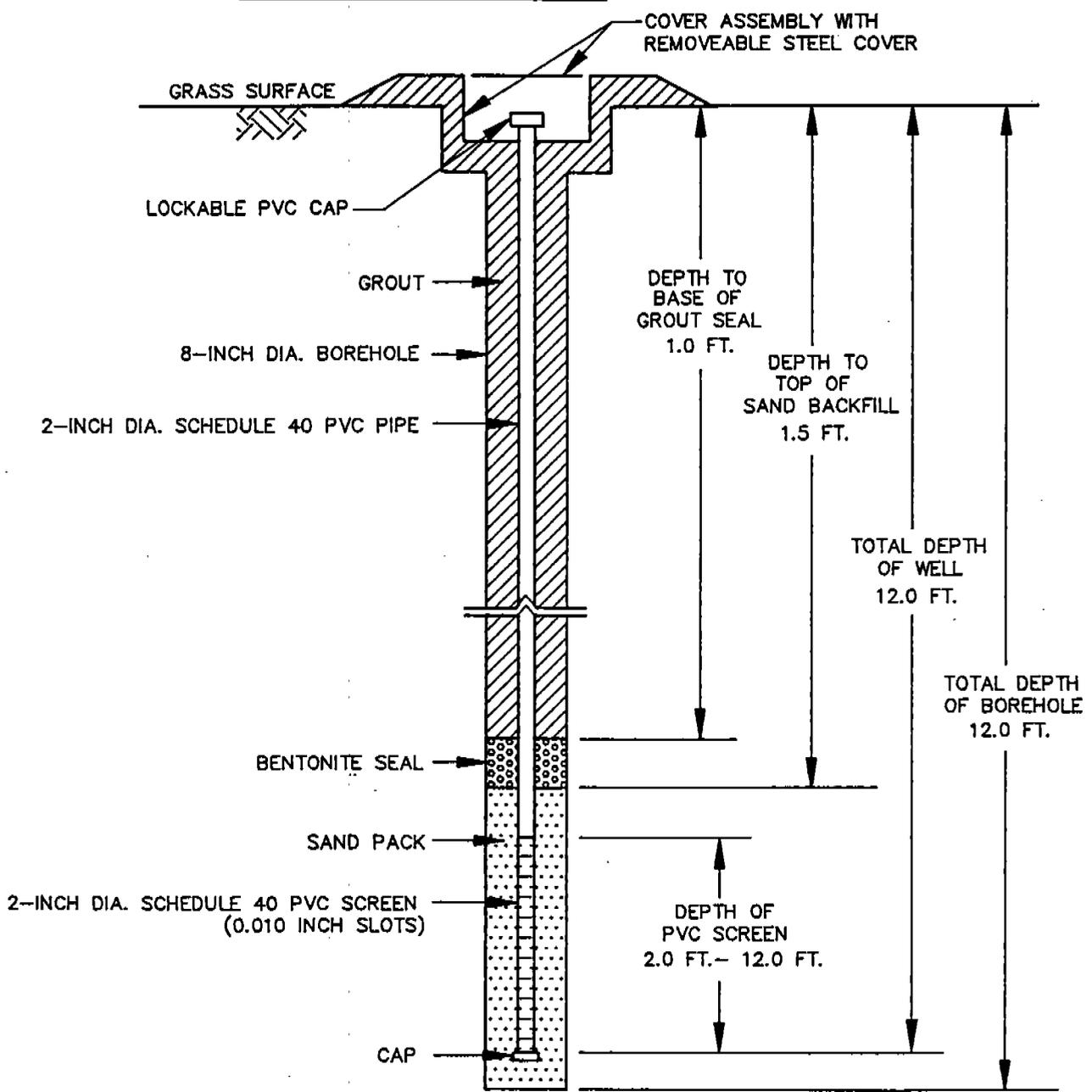
JOB NO. 259-00670-01

JOB NAME MONARCH HOSIERY MILL JOB NUMBER 259-00670-01

WELL NUMBER MW-3/SB-3

LOCATION ALTAMAHAW, NORTH CAROLINA

INSTALLATION DATE 03/11/94



LAW ENGINEERING, INC.
GREENSBORO, NORTH CAROLINA
**GROUND-WATER MONITORING WELL
INSTALLATION RECORD**
MONARCH HOSIERY MILL
ALTAMAHAW, NORTH CAROLINA

NOTE: ALL PVC JOINTS HAVE SCREW CONNECTORS

JOB NO. 259-00670-01

APPENDIX 4

Chain of Custody Forms

APPENDIX 5

Laboratory Reports

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/17/94
Page 1

--- Project Information ---

Lab Number : 64-8142-01
Project No. : 259-00670-01 T1
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : SB-1
Matrix : SO
Type : GRAB
Collector : SJG

Sampled Date/Time : 03/10/94 17:00
Received Date/Time : 03/12/94 12:40
Received From/By : SJG/JA
Chain of Custody : 23429
Number of Containers : 2

Remarks :

--- Test Data ---

Parameter..... Method.... Units PQL..... Results... Test Date Analy

-- SAMPLE PREPARATION RESULTS --

Ext/TPH-Semi-Volatile/So/Son	EPA 3550			NA	03/15/94	KH
Moisture (oven dried @105c)	D2216M	wt. %	1	13	03/15/94	KH

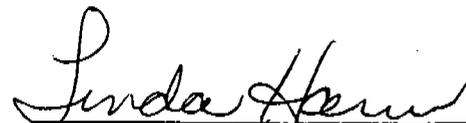
-- TPH-VOLATILE ANALYSIS RESULTS --

TPH-Volatile	SFB/5030	mg/kg	5	ND	03/14/94	TH
--------------	----------	-------	---	----	----------	----

-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --

TPH-Semi-Volatile	SFB/3550	mg/kg	10	ND	03/15/94	TH
-------------------	----------	-------	----	----	----------	----

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/17/94
Page 1

--- Project Information ---

Lab Number : 64-8142-02
Project No. : 259-00670-01 T1
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : SB-2
Matrix : SO
Type : GRAB
Collector : SJG

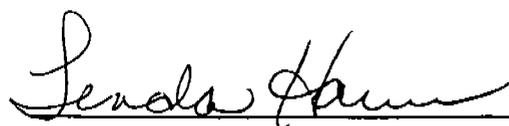
Sampled Date/Time : 03/11/94 09:30
Received Date/Time : 03/12/94 12:40
Received From/By : SJG/JA
Chain of Custody : 23429
Number of Containers : 2

Remarks : *THE CHROMATOGRAM RESEMBLES THAT OF DIESEL.
**THE CHROMATOGRAM RESEMBLES THAT OF WEATHERED GASOLINE/DIESEL.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH-Semi-Volatile/So/Son	EPA 3550			NA	03/15/94	KH
Moisture (oven dried @105c)	D2216M	wt.%	1	17	03/15/94	KH
-- TPH-VOLATILE ANALYSIS RESULTS --						
TPH-Volatile	SFB/5030	mg/kg	5	**170	03/14/94	TH
-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --						
TPH-Semi-Volatile	SFB/3550	mg/kg	10	*2500	03/16/94	TH

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/17/94
Page 1

--- Project Information ---

Lab Number : 64-8142-03
Project No. : 259-00670-01 T1
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : SB-3
Matrix : SO
Type : GRAB
Collector : SJG

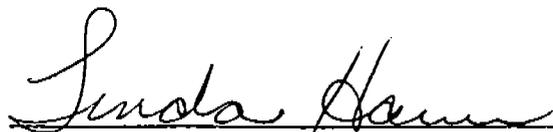
Sampled Date/Time : 03/11/94 10:30
Received Date/Time : 03/12/94 12:40
Received From/By : SJG/JA
Chain of Custody : 23429
Number of Containers : 2

Remarks : *THE CHROMATOGRAM RESEMBLES THAT OF DIESEL.
**THE CHROMATOGRAM RESEMBLES THAT OF WEATHERED GASOLINE/DIESEL.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH-Semi-Volatile/So/Son	EPA 3550			NA	03/15/94	KH
Moisture (oven dried @105c)	D2216M	wt.%	1	13	03/15/94	KH
-- TPH-VOLATILE ANALYSIS RESULTS --						
TPH-Volatile	SFB/5030	mg/kg	5	*76	03/14/94	TH
-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --						
TPH-Semi-Volatile	SFB/3550	mg/kg	10	*550	03/16/94	TH

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/17/94
Page 1

--- Project Information ---

Lab Number : 64-8142-04
Project No. : 259-00670-01 T1
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : SB-4
Matrix : SO
Type : GRAB
Collector : SJG

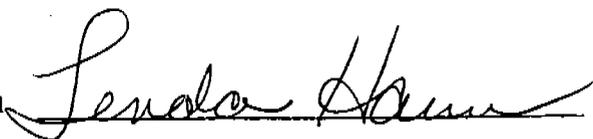
Sampled Date/Time : 03/11/94 11:30
Received Date/Time : 03/12/94 12:40
Received From/By : SJG/JA
Chain of Custody : 23429
Number of Containers : 2

Remarks : *THE CHROMATOGRAM RESEMBLES THAT OF DIESEL.
**THE CHROMATOGRAM RESEMBLES THAT OF WEATHERED GASOLINE/DIESEL.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH-Semi-Volatile/So/Son	EPA 3550			NA	03/15/94	KH
Moisture (oven dried @105c)	D2216M	wt.%	1	17	03/15/94	KH
-- TPH-VOLATILE ANALYSIS RESULTS --						
TPH-Volatile	SFB/5030	mg/kg	5	**77	03/15/94	TH
-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --						
TPH-Semi-Volatile	SFB/3550	mg/kg	10	*240	03/16/94	TH

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/17/94
Page 1

--- Project Information ---

Lab Number : 64-8142-05
Project No. : 259-00670-01 T1
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : SB-5
Matrix : SO
Type : GRAB
Collector : SJG

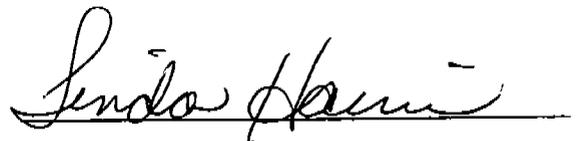
Sampled Date/Time : 03/11/94 12:30
Received Date/Time : 03/12/94 12:40
Received From/By : SJG/JA
Chain of Custody : 23429
Number of Containers : 2

Remarks : *THE CHROMATOGRAM RESEMBLES THAT OF DIESEL.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH-Semi-Volatile/So/Son	EPA 3550			NA	03/15/94	KH
Moisture (oven dried @105c)	D2216M	wt. %	1	14	03/15/94	KH
-- TPH-VOLATILE ANALYSIS RESULTS --						
TPH-Volatile	SFB/5030	mg/kg	5	ND	03/14/94	TH
-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --						
TPH-Semi-Volatile	SFB/3550	mg/kg	10	*10	03/15/94	TH

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/17/94
Page 1

--- Project Information ---

Lab Number : 64-8142-06
Project No. : 259-00670-01 T1
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : SB-6
Matrix : SO
Type : GRAB
Collector : SJG

Sampled Date/Time : 03/11/94 13:00
Received Date/Time : 03/12/94 12:40
Received From/By : SJG/JA
Chain of Custody : 23429
Number of Containers : 2

Remarks :

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH-Semi-Volatile/So/Son	EPA 3550			NA	03/15/94	KH
Moisture (oven dried @105c)	D2216M	wt. %	1	12	03/15/94	KH
-- TPH-VOLATILE ANALYSIS RESULTS --						
TPH-Volatile	SFB/5030	mg/kg	5	ND	03/14/94	TH
-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --						
TPH-Semi-Volatile	SFB/3550	mg/kg	10	ND	03/15/94	TH

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/17/94
Page 1

--- Project Information ---

Lab Number : 64-8142-07
Project No. : 259-00670-01 T1
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : DUPLICATE
Matrix : SO
Type : GRAB
Collector : SJG

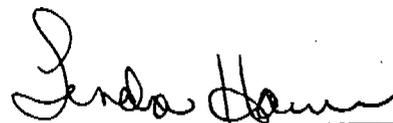
Sampled Date/Time : 03/11/94 12:30
Received Date/Time : 03/12/94 12:40
Received From/By : SJG/JA
Chain of Custody : 23429
Number of Containers : 2

Remarks : *THE CHROMATOGRAM RESEMBLES THAT OF DIESEL.

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
-- SAMPLE PREPARATION RESULTS --						
Ext/TPH-Semi-Volatile/So/Son	EPA 3550			NA	03/15/94	KH
Moisture (oven dried @105c)	D2216M	wt.%	1	16	03/15/94	KH
-- TPH-VOLATILE ANALYSIS RESULTS --						
TPH-Volatile	SFB/5030	mg/kg	5	ND	03/14/94	TH
-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --						
TPH-Semi-Volatile	SFB/3550	mg/kg	10	*19	03/15/94	TH

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/23/94
Page 1

--- Project Information ---

Lab Number : 64-8152-01
Project No. : 259-00670-01 T2
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : MW-1
Matrix : W
Type : GRAB
Collector : SJG

Sampled Date/Time : 03/14/94 16:30
Received Date/Time : 03/15/94 14:40
Received From/By : SJG/JA
Chain of Custody : 25292
Number of Containers : 5

Remarks :

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
-- SAMPLE PREPARATION RESULTS --						
Ext/PAH/W	3510/610	ug/l		NA	03/18/94	KH
-- GC ANALYSIS (BTEX) RESULTS --						
Benzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Toluene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Ethylbenzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Xylene, Total	EPA 602	ug/l	2.0	ND	03/18/94	OR
-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --						
Naphthalene	EPA 610	ug/l	10	ND	03/18/94	TH
2-Methylnaphthalene	EPA 610	ug/l	10	ND	03/18/94	TH
1-Methylnaphthalene	EPA 610	ug/l	10	ND	03/18/94	TH
Acenaphthylene	EPA 610	ug/l	10	ND	03/18/94	TH
Acenaphthene	EPA 610	ug/l	10	ND	03/18/94	TH
Fluorene	EPA 610	ug/l	10	ND	03/18/94	TH
Phenanthrene	EPA 610	ug/l	10	ND	03/18/94	TH
Anthracene	EPA 610	ug/l	10	ND	03/18/94	TH
Fluoranthene	EPA 610	ug/l	10	ND	03/18/94	TH
Pyrene	EPA 610	ug/l	10	ND	03/18/94	TH
Benzo(a)Anthracene/Chrysene	EPA 610	ug/l	10	ND	03/18/94	TH
Benzo(b)/Benzo(k)Fluoranthene	EPA 610	ug/l	10	ND	03/18/94	TH
Benzo-a-Pyrene	EPA 610	ug/l	10	ND	03/18/94	TH
Indeno(123)Pyrene/Dibenzo(ah)Anthracene	EPA 610	ug/l	10	ND	03/18/94	TH
Benzo-ghi-Perylene	EPA 610	ug/l	10	ND	03/18/94	TH

Signed

Judith Ham

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/23/94
Page 1

--- Project Information ---

Lab Number : 64-8152-02
Project No. : 259-00670-01 T2
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : MW-2
Matrix : W
Type : GRAB
Collector : SJG

Sampled Date/Time : 03/14/94 17:30
Received Date/Time : 03/15/94 14:40
Received From/By : SJG/JA
Chain of Custody : 25292
Number of Containers : 5

Remarks : SEE CASE NARRATIVE

--- Test Data ---

Parameter..... Method.... Units PQL..... Results... Test Date Analy

-- SAMPLE PREPARATION RESULTS --

Ext/PAH/W	3510/610	ug/l		NA	03/18/94	KH
-----------	----------	------	--	----	----------	----

-- GC ANALYSIS (BTEX) RESULTS --

Benzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Toluene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Ethylbenzene	EPA 602	ug/l	1.0	1.1	03/18/94	OR
Xylene, Total	EPA 602	ug/l	2.0	5.3	03/18/94	OR

-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --

Naphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
2-Methylnaphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
1-Methylnaphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
Acenaphthylene	EPA 610	ug/l	50	ND	03/22/94	TH
Acenaphthene	EPA 610	ug/l	50	ND	03/22/94	TH
Fluorene	EPA 610	ug/l	50	ND	03/22/94	TH
Phenanthrene	EPA 610	ug/l	50	ND	03/22/94	TH
Anthracene	EPA 610	ug/l	50	ND	03/22/94	TH
Fluoranthene	EPA 610	ug/l	50	ND	03/22/94	TH
Pyrene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo(a)Anthracene/Chrysene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo(b)/Benzo(k)Fluoranthene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo-a-Pyrene	EPA 610	ug/l	50	ND	03/22/94	TH
Indeno(123)Pyrene/Dibenzo(ah)Anthracene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo-ghi-Perylene	EPA 610	ug/l	50	ND	03/22/94	TH

Signed

Sinda Han

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/23/94
Page 1

--- Project Information ---

Lab Number : 64-8152-03
Project No. : 259-00670-01 T2
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : MW-3
Matrix : W
Type : GRAB
Collector : SJG

Sampled Date/Time : 03/14/94 18:30
Received Date/Time : 03/15/94 14:40
Received From/By : SJG/JA
Chain of Custody : 25292
Number of Containers : 5

Remarks : SEE CASE NARRATIVE

--- Test Data ---

Parameter.....	Method....	Units	PQL.....	Results...	Test Date	Analy
----------------	------------	-------	----------	------------	-----------	-------

-- SAMPLE PREPARATION RESULTS --

Ext/PAH/W	3510/610	ug/l		NA	03/18/94	KH
-----------	----------	------	--	----	----------	----

-- GC ANALYSIS (BTEX) RESULTS --

Benzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Toluene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Ethylbenzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Xylene, Total	EPA 602	ug/l	2.0	17	03/18/94	OR

-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --

Naphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
2-Methylnaphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
1-Methylnaphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
Acenaphthylene	EPA 610	ug/l	50	ND	03/22/94	TH
Acenaphthene	EPA 610	ug/l	50	ND	03/22/94	TH
Fluorene	EPA 610	ug/l	50	ND	03/22/94	TH
Phenanthrene	EPA 610	ug/l	50	ND	03/22/94	TH
Anthracene	EPA 610	ug/l	50	ND	03/22/94	TH
Fluoranthene	EPA 610	ug/l	50	ND	03/22/94	TH
Pyrene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo(a)Anthracene/Chrysene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo(b)/Benzo(k)Fluoranthene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo-a-Pyrene	EPA 610	ug/l	50	ND	03/22/94	TH
Indeno(123)Pyrene/Dibenzo(ah)Anthracene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo-ghi-Perylene	EPA 610	ug/l	50	ND	03/22/94	TH

Signed

Linda Han

LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/23/94
Page 1

--- Project Information ---

Lab Number : 64-8152-04
Project No. : 259-00670-01 T2
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : DUPLICATE
Matrix : W
Type : GRAB
Collector : SJG

Sampled Date/Time : 03/14/94 17:30
Received Date/Time : 03/15/94 14:40
Received From/By : SJG/JA
Chain of Custody : 25292
Number of Containers : 5

Remarks : SEE CASE NARRATIVE

--- Test Data ---

Parameter..... Method.... Units PQL..... Results... Test Date Analy

-- SAMPLE PREPARATION RESULTS --

Ext/PAH/W 3510/610 ug/l NA 03/18/94 KH

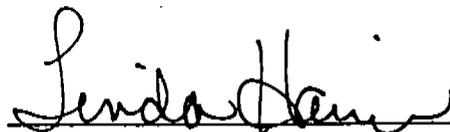
-- GC ANALYSIS (BTEX) RESULTS --

Benzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Toluene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Ethylbenzene	EPA 602	ug/l	1.0	1.8	03/18/94	OR
Xylene, Total	EPA 602	ug/l	2.0	8.7	03/18/94	OR

-- TPH-SEMI-VOLATILE / PAH ANALYSIS RESULTS --

Naphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
2-Methylnaphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
1-Methylnaphthalene	EPA 610	ug/l	50	ND	03/22/94	TH
Acenaphthylene	EPA 610	ug/l	50	ND	03/22/94	TH
Acenaphthene	EPA 610	ug/l	50	ND	03/22/94	TH
Fluorene	EPA 610	ug/l	50	ND	03/22/94	TH
Phenanthrene	EPA 610	ug/l	50	ND	03/22/94	TH
Anthracene	EPA 610	ug/l	50	ND	03/22/94	TH
Fluoranthene	EPA 610	ug/l	50	ND	03/22/94	TH
Pyrene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo(a)Anthracene/Chrysene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo(b)/Benzo(k)Fluoranthene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo-a-Pyrene	EPA 610	ug/l	50	ND	03/22/94	TH
Indeno(123)Pyrene/Dibenzo(ah)Anthracene	EPA 610	ug/l	50	ND	03/22/94	TH
Benzo-ghi-Perylene	EPA 610	ug/l	50	ND	03/22/94	TH

Signed



LAW ENVIRONMENTAL NATIONAL LABORATORIES
TEST DATA REPORT

Date 03/23/94
Page 1

--- Project Information ---

Lab Number : 64-8152-05
Project No. : 259-00670-01 T2
Project Name : MONARCH HOSIERY

Cust. No. :

Manager: STEVE GOSSELIN

--- Sample Information ---

Station ID : TRIP BLANK
Matrix : W
Type : GRAB
Collector :

Sampled Date/Time : 03/11/94 :
Received Date/Time : 03/15/94 14:40
Received From/By : SJG/JA
Chain of Custody : 25292
Number of Containers : 2

Remarks :

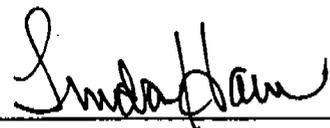
--- Test Data ---

Parameter..... Method.... Units PQL..... Results... Test Date Analy

-- GC ANALYSIS (BTEX) RESULTS --

Benzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Toluene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Ethylbenzene	EPA 602	ug/l	1.0	ND	03/18/94	OR
Xylene, Total	EPA 602	ug/l	2.0	ND	03/18/94	OR

Signed





LAW

ENGINEERING AND ENVIRONMENTAL SERVICES

CASE NARRATIVE

To: Steve Gosselin

From: Linda Harris 

Date: March 23, 1994

Subject: LENL No. 64-8152-01, -02, and -04
LE No. 259-00670-01 T2

The PAH data on the above referenced sample by EPA method 610 were confirmed by EPA method 8270. Due to matrix interference the 8270 values were reported at a PQL of 50 ug/L. The 1-methylnaphthalene datum is calculated as a TIC and therefore is estimated. 1-Methylnaphthalene is not a component of EPA method 8270.

If you have any questions, please call me at (404) 426-4309.

**LAW ENVIRONMENTAL, INC.
NATIONAL LABORATORIES**

112 TOWN PARK DRIVE • KENNESAW, GA 30144
(404) 421-3400 • FAX (404) 421-3486

APPENDIX 6

Documentation

SITE SENSITIVITY EVALUATION (SSE)

Based on the information collected during our contracted scope of assessment activities, we completed an SSE. Preparation of an SSE for the subject site indicates that concentrations of up to 60 ppm of volatile TPH and 240 ppm semi-volatile TPH may be allowed to remain in place. A copy of the completed SSE form is included in this Appendix.

The following conditions apply to the site and were used in the preparation of the SSE:

- Grain size of the soils has been characterized as silt by the Law Engineering on-site geologist.
- Relict structures were present in the soil samples collected in the excavation and intersect the water table.
- The distance from the location of the deepest known soils containing petroleum hydrocarbon concentrations in excess of the state action levels of 10 ppm volatile TPH and 40 ppm semi-volatile TPH to ground water is less than five feet.
- The top of bedrock is located below the water table.
- No artificial conduits are present within the zone of contamination.

Applying the initial Total Site Characteristics score of 80 (SSE Table 1) to SSE Table 2, the Initial Cleanup Level of Low Boiling Point Hydrocarbons is 60 ppm. Applying the same Initial Total Site Characteristics score of 80 to SSE Table 2, the Initial Cleanup Level for High Boiling Point Hydrocarbons is 240 ppm. Since the site meets the requirements for a category B site (as defined in SSE Table 3), the Site Final Cleanup Level would be 60 ppm volatile and 240 ppm semi-volatile TPH.

Site Sensitivity Evaluation (SSE)

Initial Cleanup Level
(Step 2)

Final Cleanup Level
(Step 3)

**EPA Method 5030 for
Low Boiling Point Hydrocarbons
such as Gasoline, Aviation Fuels, Gasohol**

Total Site Characteristics Score	Initial Cleanup Level TPFH (ppm)		Category A & B (Multiply initial cleanup level by 1)	Final Cleanup Level
>150	≤10	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Select Site Category* → </div>	1 x 60 = 60 ppm	
121-150	20		Category C & D (Multiply initial cleanup level by 2)	2 x _____ = _____ ppm
91-120	40		Category E (Multiply initial cleanup level by 3)	3 x _____ = _____ ppm
61-90	60			
31-60	80			
0-30	100			

**EPA Method 3550 for
High Boiling Point Hydrocarbons
such as Kerosene, Diesel, Varsol, Mineral Spirits, Naphtha**

Total Site Characteristics Score	Initial Cleanup Level TPFH (ppm)		Category A & B (Multiply initial cleanup level by 1)	Final Cleanup Level
>150	≤40	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Select Site Category* → </div>	1 x 240 = 240 ppm	
121-150	80		Category C & D (Multiply initial cleanup level by 2)	2 x _____ = _____ ppm
91-120	160		Category E (Multiply initial cleanup level by 3)	3 x _____ = _____ ppm
61-90	240			
31-60	320			
0-30	400			

**EPA Method 9071 for
Heavy Fuels - Oil & Grease (O&G)
such as Fuel Oil #4, #5, #6, Motor Oil, Hydraulic Fluid**

Total Site Characteristics Score	Initial Cleanup Level O&G (ppm)		Category A & B (Multiply initial cleanup level by 1)	Final Cleanup Level
>150	≤250	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Select Site Category* → </div>	1 x _____ = _____ ppm	
121-150	400		Category C & D (Multiply initial cleanup level by 2)	2 x _____ = _____ ppm
91-120	550		Category E (Multiply initial cleanup level by 3)	3 x _____ = _____ ppm
61-90	700			
31-60	850			
0-30	1000			

* See Site Category Descriptions, Table 3

Table 1
Site Sensitivity Evaluation (SSE)
 Site Characteristics Evaluation (Step 1)

Characteristic	Condition	Rating	
Grain Size*	Gravel	150	
	Sand	100	
	Silt	50	
	Clay	0	
			50
Are relict structures, sedimentary structures, and/or textures present in the zone of contamination and underlying "soils"?	Present and intersecting the water table.	10	
	Present but <u>not</u> intersecting the water table.	5	
	None present.	0	
			10
Distance from location of deepest contaminated soil** to water table.	0 - 5 feet	20	
	(C, D & E sites only)	20	
	5 - 10 feet	10	
	>10 - 40 feet	0	
	> 40 feet	0	
			20
Is the top of bedrock or transmissive indurated sediments located above the water table?	Yes	20	
	No	0	
			0
Artificial conduits present within the zone of contamination.	Present and intersecting the water table.	10	
	Present but <u>not</u> intersecting the water table.	5	
	Not present.	0	
			0

Total Site Characteristics Score:	80
--	-----------

* Predominant grain size based on Unified Soil Classification System or U.S. Dept. of Agriculture Soil Classification Method.

** (>10 ppm TPFH by Method 5030; >40 ppm TPFH by Method 3550; >250 ppm O&G by Method 9071)

TABLE 3

SSE SITE CATEGORY DESCRIPTIONS

CATEGORY A (*Site meets any one of the criteria*)

1. Water supply well(s) contaminated and not served by accessible public water supply.
2. Vapors present in confined areas at explosive or health concern levels.
3. Treated surface water supply in violation of the safe drinking water standards.

CATEGORY B (*Site meets any one of the criteria*)

1. Water supply well(s) contaminated, but served by accessible public water supply.
2. Water supply well(s) within 1500 feet of site, but not contaminated and not served by accessible public water supply.
3. Vapors present in confined areas but not at explosive or health concern levels.

CATEGORY C (*Site meets both of the criteria*)

1. No known water supply well(s) contaminated.
2. Water supply well(s) greater than 1500 feet from site but not served by accessible public water supply.

CATEGORY D (*Site meets both of the criteria*)

1. No known water supply well(s) contaminated.
2. Water supply well(s) within 1500 feet of site but served by accessible public water supply.

CATEGORY E (*Site meets both of the criteria*)

1. No known water supply well(s) contaminated or within 1500 feet of site.
2. Area served by accessible public water supply.

Calculation of Ground Water Flow Direction

Using relative elevations of ground water beneath the site:

Well	Relative Elevation	Depth to Water	Ground-Water Elevation (ft)
MW-1	100.00	5.63	94.37
MW-2	98.81	5.62	93.19
MW-3	97.33	4.97	92.36

And using measured distances between monitoring wells:

From	To	Distance (ft)
MW-1	MW-2	68
MW-1	MW-3	102
MW-2	MW-3	40

Solving the following equation for MW-2 elevation on line between MW-1 and MW-3

$$\frac{d}{L} = \frac{dh}{X}$$

$$\frac{\text{MW-1} - \text{MW-3}}{l_{13}} = \frac{\text{MW-1} - \text{MW-2}}{l_{12}}$$

$$\frac{94.37 - 92.36}{102} = \frac{94.37 - 93.19}{X}$$

$$X = 59.7 \text{ ft}$$

Project MW-2 ground-water elevation on line between MW-1 and MW-3 at a point 59.7' from MW-1 towards MW-3.

The ground-water flow direction is 90° from the above projection line.

Thus the ground-water flow direction is estimated as due north.

Calculation of Hydraulic Gradients

Using the relative ground-water elevations :

Well	Ground-Water Elevation (ft)
MW-1	94.37
MW-2	93.19
MW-3	92.36

And using the measured distances between monitoring wells:

From	To	Distance (ft)
MW-1	MW-2	68
MW-1	MW-3	102
MW-2	MW-3	40

The hydraulic gradient (I) may be calculated by solving the following equation:

$$I = \frac{dh}{dl} \quad \text{where}$$

dh = difference in ground-water elevation, ft

dl = horizontal distance between the monitoring wells, ft

Example:

MW-1 to MW-2

$$I = \frac{dh}{L}$$

$$I_{1-2} = \frac{94.37 - 93.19}{68}$$

$$I_{1-2} = 0.017 \text{ ft/ft}$$

Summary of calculated hydraulic gradient (I):

From	To	Hydraulic Gradient (ft/ft)
MW-1	MW-2	0.017
MW-1	MW-3	0.020
MW-2	MW-3	0.021

$$\begin{aligned} \text{Weighted gradient} &= \frac{(0.017)(68) + (0.020)(102) + (0.021)(40)}{68 + 102 + 40} \\ &= \frac{1.156 + 2.04 + 0.84}{210} = \frac{4.036}{210} = 0.019 \text{ ft/ft} \end{aligned}$$