

**FILE**

**COMPLIANCE PLAN  
SEMI-ANNUAL REPORT**

**JANUARY 1 THROUGH  
JUNE 30, 1996**

**Terranext**



## Southern Pacific Lines

### Environmental Affairs Group

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July 18, 1996

Mr. Dan Pearson  
Executive Director  
Permits Section (MC 130)  
Texas Natural Resource Conservation Commission  
P.O. Box 13087  
Austin, Texas 78711-3087

**Re: Southern Pacific Transportation Company (SPTCo)  
4910 Liberty Road Facility, Houston  
Post-Closure Care Permit No. HW-50343-000  
Industrial Solid Waste Registration NO. 31547  
EPA ID No. TXD000820266  
Compliance Plan No. CP-50343  
Semi-annual Report: January 1 through June 30, 1996**

Dear Mr. Pearson:

The enclosed report presents a summary of activities conducted for the referenced facility performed as part of the post-closure care and submitted in accordance with Provision VII.B.2 of the Compliance Plan. The designated reporting period includes January 1 through June 30, 1996.

Please call me at (415) 541-2545 if you have any questions about this correspondence.

Sincerely,

Greg Shepherd  
Director of Environmental Projects

Enclosure  
Distribution: per Attachment





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**HOUSTON WOOD PRESERVING WORKS  
COMPLIANCE PLAN NO. CP-50343**

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**COMPLIANCE PLAN  
SEMI-ANNUAL REPORT  
JANUARY 1 THROUGH JUNE 30, 1996**

**Southern Pacific Transportation Company  
Wood Preserving Works  
4910 Liberty Road  
Houston, Texas**

**Terranext Project No. 44102069.05**

**Prepared For:**

**Southern Pacific Lines  
One Market Plaza  
San Francisco, California 94105**

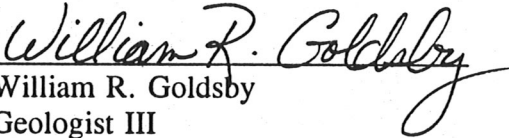
**July 18, 1996**

**Terranext**


**COMPLIANCE PLAN  
SEMI-ANNUAL REPORT  
JANUARY 1 THROUGH JUNE 30, 1996**

**Southern Pacific Transportation Company  
Wood Preserving Works  
4910 Liberty Road  
Houston, Texas**

Prepared By:

  
William R. Goldsby  
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Reviewed By:

  
Steven Lange  
Technical Manager

**Terranext**

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
1.1	Purpose .....	1
1.2	Applicability and Scope .....	1
2.0	REPORT ITEMS .....	5
2.1	Corrective Action and Ground Water Monitoring Summary .....	5
2.1.1	Corrective Action System .....	5
2.1.2	Ground Water Monitoring .....	5
2.2	Analytical Data .....	6
2.3	Water Level Elevations .....	7
2.4	Potentiometric Surface Data .....	7
2.5	Non-Aqueous Phase Liquids .....	7
2.6	Analytical Data Evaluation .....	7
2.7	Naphthalene, Acenaphthene, and BTEX Concentrations .....	8
2.8	Updated Compliance Plan Schedule .....	8
2.9	Monitoring/Corrective Action Program Changes and Inspections .....	9
2.10	Recommendation for Any Changes .....	10
2.11	Other Items Requested by the Executive Director .....	10

## FIGURES

Figure 1	Site Vicinity .....	2
Figure 2	Monitoring Wells and Piezometers .....	11
Figure 3	Potentiometric Surface: Upper Transmissive Zone; 01/23/96 .....	12
Figure 4	Piezometric Surface: Second Transmissive Zone; 01/23/96 .....	13
Figure 5	Interpretation of Naphthalene: Upper Transmissive Zone; 01/23/96 ....	14
Figure 6	Interpretation of Acenaphthene: Upper Transmissive Zone; 01/23/96 ...	15
Figure 7	Interpretation of Total BTEX: Upper Transmissive Zone; 01/23/96 ....	16
Figure 8	Interpretation of Naphthalene: Second Transmissive Zone; 01/23/96 ....	17
Figure 9	Interpretation of Acenaphthene: Second Transmissive Zone; 01/23/96 ...	18
Figure 10	Interpretation of Total BTEX: Second Transmissive Zone; 01/23/96 ....	19

## TABLE OF CONTENTS (continued)

### TABLES

Table 1	Summary of Analytical Results for UTZ (E1 +35-Foot Sand Zone) Monitor Wells First Semi-annual Period 1996 . . . . .	20
Table 2	Summary of Analytical Results for STZ (E1 +15-Foot Sand Zone) Monitor Wells and Piezometers First Semi-annual Period 1996 . . . . .	21
Table 3	Water Level Elevations First Semi-annual 1996 . . . . .	22
Table 4	Compliance of Wells and Piezometers with Ground Water Protection Standard . . . . .	23

### APPENDICES

Appendix A	Designation of Wells by Function
Appendix B	Field Tracking Report and Ground Water Sampling Forms
Appendix C	Potential Contaminants of Concern and Concentration Limits for Ground Water Protection Standard
Appendix D	Compliance Plan Schedule
Appendix E	Indicator Parameters and Concentration Limits for Ground Water Protection Standard



## 1.0 INTRODUCTION

### 1.1 Purpose

On June 20, 1994, the Texas Natural Resource Conservation Commission (TNRCC) issued Permit Number HW-50343-000 (hereinafter, Permit) and TNRCC Compliance Plan Number CP-50343, which is incorporated within the Permit. The Permit applies to post-closure care for one former surface impoundment (TNRCC Permit Unit No. II.B.1) located at the Southern Pacific Transportation Company (SPTCo) former Houston Wood Preserving Works (HWPW), 4910 Liberty Road, Houston, Texas (Figure 1). The Permit requires a RCRA Facility Investigation (RFI), and the Compliance Plan (CP) requires an Extent of Contamination (EOC) Investigation; the EOC Work Plan dated September 16, 1994, and the RFI Work Plan dated October 14, 1994, were approved respectively by letters from the TNRCC dated September 29 and October 16, 1995. Phase 1 Investigation activities outlined in the EOC and RFI Work Plans were initiated in October 1995. SPTCO submitted the Phase 1 RFI/EOC Investigation Report to the TNRCC on May 23, 1996. This Semi-Annual Report (SAR) was prepared to comply with the requirements of CP Provision VII.B.2. All referenced figures and tables are presented at the end of each major report section.

The activity period covered by this report is designated in CP Provision VII.B.2.a and encompasses January 1 through June 30, 1996, as the preceding six-month period.

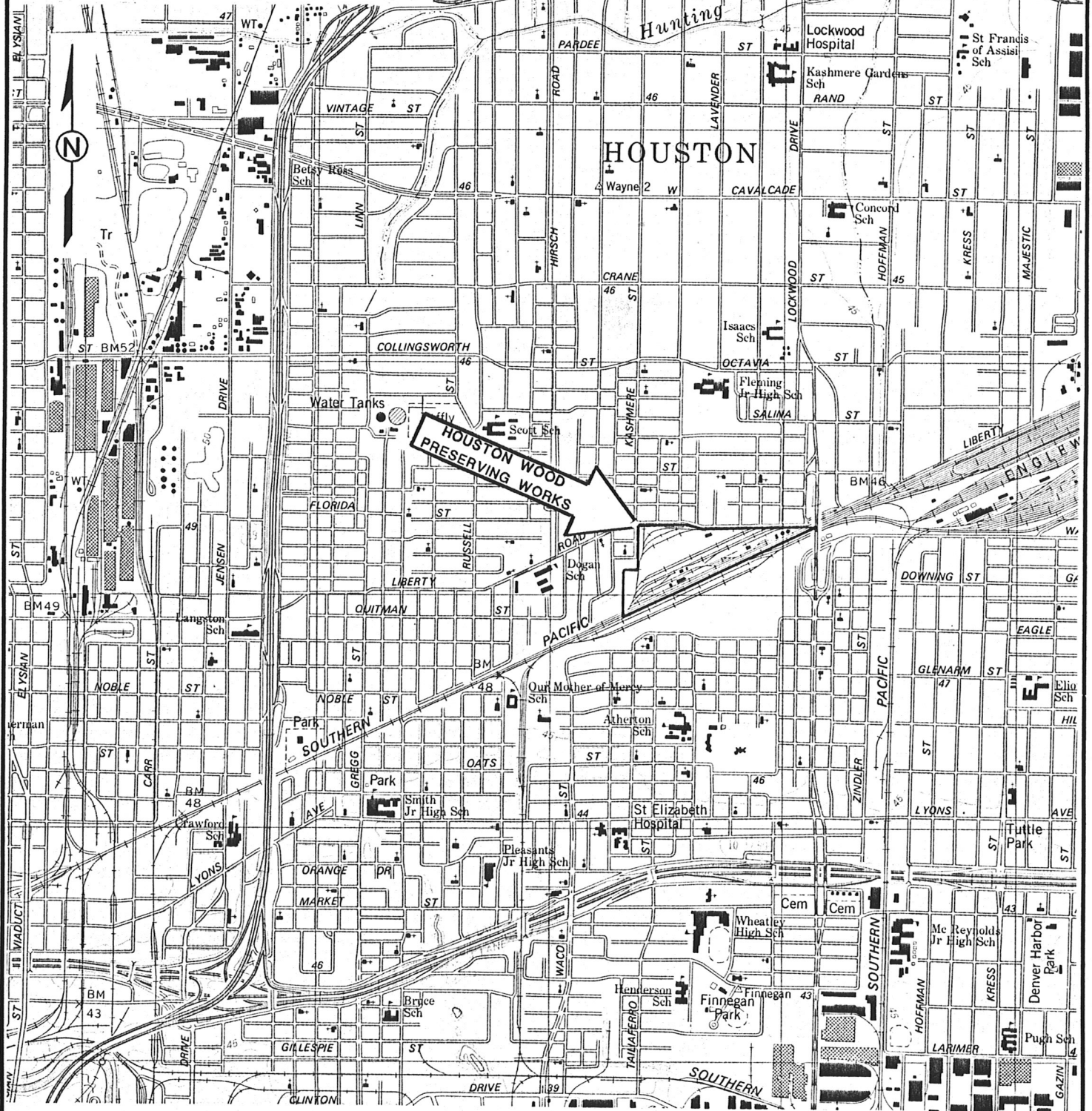
### 1.2 Applicability and Scope

Provisions VII.B.2.a through VII.B.2.m of the Compliance Plan require that this SAR include the following:

# SETTEGAST QUADRANGLE

TEXAS-HARRIS CO.

7.5 MINUTE SERIES (TOPOGRAPHIC)



PROJ.# 44102069

PAGE#

SCALE: 1" = 2000'

DRAWN BY: AP

FILE NO. FIG1-1

DESIGNED BY:

DATE: 3/26/96

APPROVED BY: WRG



**FIGURE 1**  
**SITE VICINITY MAP**  
**SPTCo WOOD PRESERVING WORKS**  
**4910 LIBERTY ROAD**  
**HOUSTON, TEXAS**

- a. Narrative summary of the evaluations made in accordance with Sections V, VI, and VII with regard to corrective action and ground water monitoring.
- b. Tabulated chemical analyses indicating each parameter that exceeds the Ground Water Protection Standard (CP Table I, Appendix A).
- c. Tabulated water level elevations (relative to mean sea level), depth to water measurements, and total depth of well measurements.
- d. Potentiometric surface maps of water table elevation during sampling events.
- e. If a recovery system is installed, potentiometric surface maps indicating radius of influence, hydraulic gradients, and regional ground water flow.
- f. Tabulation of the depth and thickness of non-aqueous phase liquids (NAPLs), if present, in each well for each sampling event performed during the period.
- g. If a recovery system is installed, tabulation of monthly quantities of recovered ground water and NAPLs, if encountered, and graphs of weekly recorded flow rates versus time for Recovery Wells during each quarter.
- h. Tabulation of data evaluation results and status of compliance of each well of CP Table III (Appendix B) with respect to the Ground Water Protection Standards.
- i. Isopleth contour maps of naphthalene; acenaphthene; and total benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations.
- j. Updated schedule summary per CP Provision XI.A.
- k. Summary of any changes made to the monitoring/corrective action program and summary of Recovery Well inspections, repairs, and any operational difficulties.
- l. Recommendation for any changes.
- m. Any other items requested by the Executive Director.

A recovery system has not been installed for this facility. Therefore, Items e, g, and k (as each relates to Recovery Wells) will not be addressed further in this SAR. All other items as listed above are addressed in text summary in Section 2.0 of the SAR, with supporting figures and tables presented at the end of Section 2.0. Reference information is presented in the appendices.

## 2.0 REPORT ITEMS

### 2.1 Corrective Action and Ground Water Monitoring Summary

#### 2.1.1 Corrective Action System

Existing wells were sampled and monitored to evaluate the extent of ground water contamination in the Uppermost Transmissive Zone (UTZ) and the Second Transmissive Zone (STZ). The definition of the UTZ and STZ is consistent with CP Provision I.A:

- \* UTZ refers to the first sand unit encountered at approximately 35 feet above mean sea level (MSL), averaging 6 to 8 feet in thickness.
- \* STZ refers to the second sand unit encountered at approximately 15 feet MSL, averaging 8 to 10 feet in thickness.

Existing monitoring wells in the UTZ, designated by function consistent with CP Table III, include Corrective Action Observation (CAO) wells (MW-4, -5, -7, -8, and -9) and Point of Compliance (POC) wells (MW-1a, -2, -7, -10a, and -11a). Existing wells in the STZ include POC wells (MW-10b and MW-11b) and piezometers (P-10, -11, and -12) (Appendix A).

#### 2.1.2 Ground Water Monitoring

Monitor wells and piezometers, shown in Figure 2, were sampled on January 23 and 24, 1996 as the first semi-annual monitoring event in 1996. The schedule for ground water

monitoring was changed from quarterly to semi-annual beginning with the July 1995 event, as provided by Provision VI.C.3 of the Compliance Plan.

Ground water monitoring results, including analytical laboratory reports, were first presented to TNRCC in the First Semi-annual Period 1996 Monitoring and Sampling Report, dated March 22, 1996. Ten ground water monitor wells (MW-1a, MW-2, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10a, and MW-11a) completed in the UTZ (El +35-foot zone) and two monitor wells (MW-10b and MW-11b) and three piezometers (P-10, P-11, and P-12) completed in the STZ (El +15-foot zone) were sampled during the first semi-annual period 1996. Field tracking reports and ground water sampling forms from the first semi-annual sampling event in 1996 are provided in Appendix B.

In March 1995, steel well covers were installed on one monitor well (MW-5) and the three piezometers (P-10, P-11 and P-12). The upgrades affected the top of casing elevations of the well and piezometers, therefore all monitor wells and piezometers were resurveyed by Survcon, Inc. of Houston, Texas on January 9, 1996. All elevation data was referenced to the survey performed on January 9, 1996.

## 2.2 Analytical Data

The ground water analytical data for the first semi-annual sampling event are listed in Tables 1 and 2 (page 20 and 21); results are tabulated for the UTZ and STZ. Detected concentrations of analytes in excess of the Ground Water Protection Standard (Appendix C) are indicated by shading on these tables.



### 2.3 Water Level Elevations

Table 3 lists the total depth, casing reference elevation, measured depth to water, and calculated water level elevation relative to mean sea level for each monitor well and piezometer.

### 2.4 Potentiometric Surface Data

Figure 3 depicts the potentiometric surface map of water table elevations for the UTZ during the first semi-annual monitoring event. Figure 4 depicts the piezometric surface for the STZ during the first semi-annual monitoring event, showing the elevations to which ground water in the STZ rises when hydrostatic pressure is released. The gradient for UTZ is calculated to be 0.002 foot/foot to the south. The gradient for the STZ is calculated to be 0.001 foot/foot to the southwest.

### 2.5 Non-Aqueous Phase Liquids

No light or dense NAPLs were noted within any of the monitor wells or piezometers during the first semi-annual monitoring event.

### 2.6 Analytical Data Evaluation

Compliance Plan Provision VI.D provides two options for data evaluation; direct comparison with the concentration limits for the Ground Water Protection Standard or statistical analysis of the data. Table 4 lists the results of direct comparison of the analytical data for the first semi-annual sampling event with the Ground Water Protection Standard and specifications of CP Provision VI.D.1. Wells and piezometers are considered compliant with the Ground Water Protection Standard if all constituents of concern were detected at concentrations less

than or equal to the respective concentration limit. Wells and piezometers are considered noncompliant if one or more constituents of concern were detected at a concentration greater than the respective concentration limit.

## 2.7 Naphthalene, Acenaphthene, and BTEX Concentrations

The naphthalene, acenaphthene, and combined total BTEX concentrations are illustrated in Figures 5 through 7, for the UTZ, and Figures 8 through 10 for the STZ, respectively, for the UTZ and STZ during the first semi-annual sampling event.

## 2.8 Updated Compliance Plan Schedule

The Schedule for Compliance Plan Activities dated August 19, 1994, was prepared as required by CP Provision XI.A. By letter of November 3, 1994, the TNRCC recognized the dates and time-lines for the required activities to be correct and in accordance with the Compliance Plan. The revised schedule submitted with this report includes an estimated schedule for completion of RCRA Facility Investigation tasks required by the Permit.

Time frames, dates, and/or deadlines that were not specified in the Compliance Plan for required activities have been assumed based upon the estimated level of effort to complete the tasks. In some instances, the period for regulatory review was estimated to be 30 days from submittal date of the deliverable. Where unspecified in the Compliance Plan, the period of time for revisions to deliverables was assumed to be 60 days.

The EOC Work Plan dated September 16, 1994, was prepared as required under CP Provisions VIII and XI.D. In response to the TNRCC letter of April 11, 1995, the EOC Work Plan and implementation schedule were amended and submitted to the TNRCC on May 19, 1995. In the TNRCC EOC Work Plan approval letter, dated September 29, 1995,

the TNRCC requested a revised schedule corresponding to the date of initiation of the investigation; the revised schedule was submitted on November 22, 1995. The current and latest updated schedule is presented in Appendix D, and incorporates ongoing investigation activities and revisions to reflect actual dates of task completion and anticipated start dates for upcoming events.

The EOC Investigation Report required by CP Provisions VIII.E and IX was preliminarily submitted to TNRCC as a component of the Phase 1 RFI/EOC Investigation Report, dated May 23, 1996. The schedule included herein provides for semi-annual ground water monitoring to continue at the closed impoundment. Phase 2 of the EOC Investigation will focus on the area south and southwest of the permitted unit to determine what impact Area of Concern (AOC) 6, the Inactive Wastewater Lagoon, may have on ground water quality in the vicinity of the permitted unit.

The Corrective Action Study Work Plan is required by CP Provision IX within 60 days of TNRCC approval of the EOC Investigation Report. The EOC Investigation Report will be submitted as a component of the Phase 2 RFI/EOC Investigation Report. The Corrective Action Study may involve treatability or pilot studies for which time frames are currently uncertain. Similarly, the schedule for the corrective action phase of the project is uncertain due to existing data gaps and the need for subsequent technical and regulatory evaluation of the findings of the proposed investigation, including evaluation of risk-based cleanup standards. The Corrective Action Report is now anticipated to be approved in June 1999.

## 2.9 Monitoring/Corrective Action Program Changes and Inspections

By letter of January 10, 1995, the TNRCC acknowledged fulfillment of the requirement of CP Provision XI.B by the Operation & Maintenance (O&M) Plan dated August 19, 1994, together with the addendum to the O&M Plan dated December 8, 1994. By letter of

October 13, 1995, the TNRCC approved O&M Plan Amendment 3, which included quarterly monitor well inspections.

Integrity of the well casings and siltation of the wells were evaluated during the January 1996 sampling event in accordance with CP Provision VI.C.4.e. Monitor wells and piezometers were also inspected in April 1996.

POC and CAO wells and the piezometers were monitored on a quarterly basis to provide four quarters of baseline data through July 1995. Consistent with CP Provisions VI.C.3.a and VI.C.3.e, the POC wells and the CAO wells will be sampled and analyzed for the constituents of CP Table II (Appendix E) on a semi-annual basis which began in July 1995.

#### 2.10 Recommendation for Any Changes

No changes in the monitoring/corrective action program are recommended at this time, pending approval and implementation of proposed Phase 2 of the RFI/EOC Investigation as presented in the Phase 1 RFI/EOC Investigation Report.

#### 2.11 Other Items Requested by the Executive Director

No other items have been requested by the Executive Director of the TNRCC.

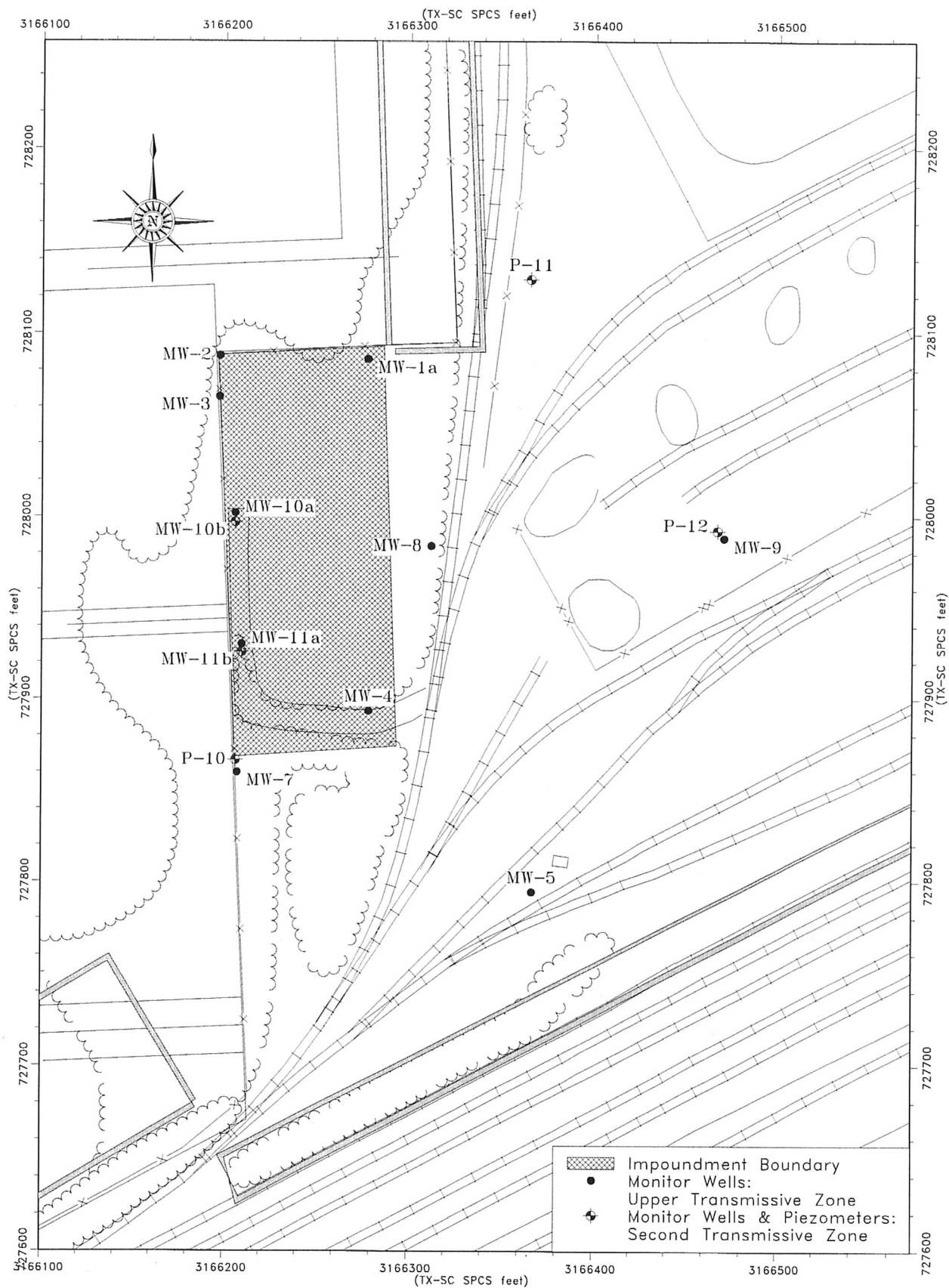


Figure 2. Monitoring Wells and Piezometers

# Potentiometric Surface: Upper Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

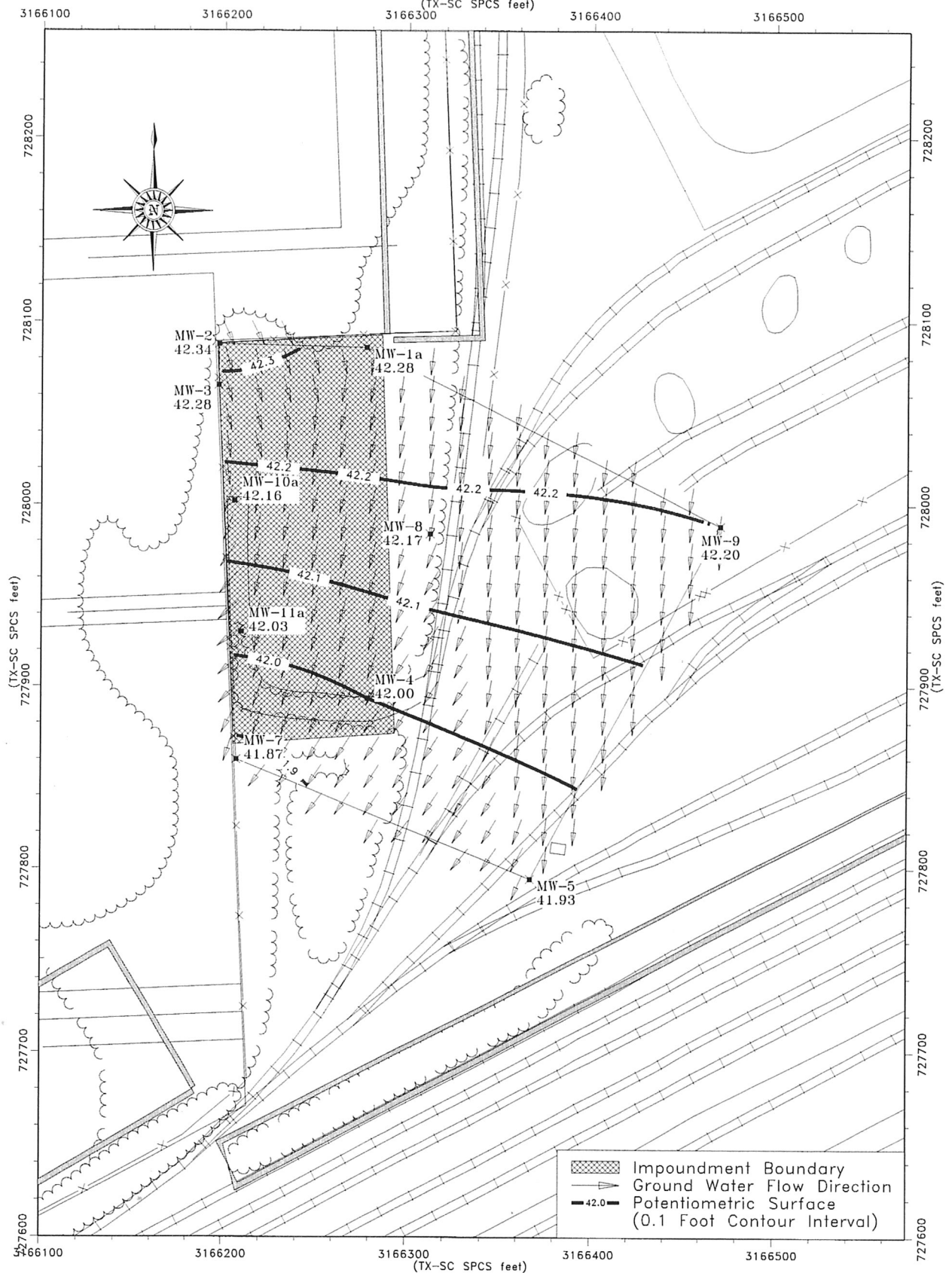


Figure 3. Potentiometric Surface: Upper Transmissive Zone; 01/23/96



# Piezometric Surface: Second Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

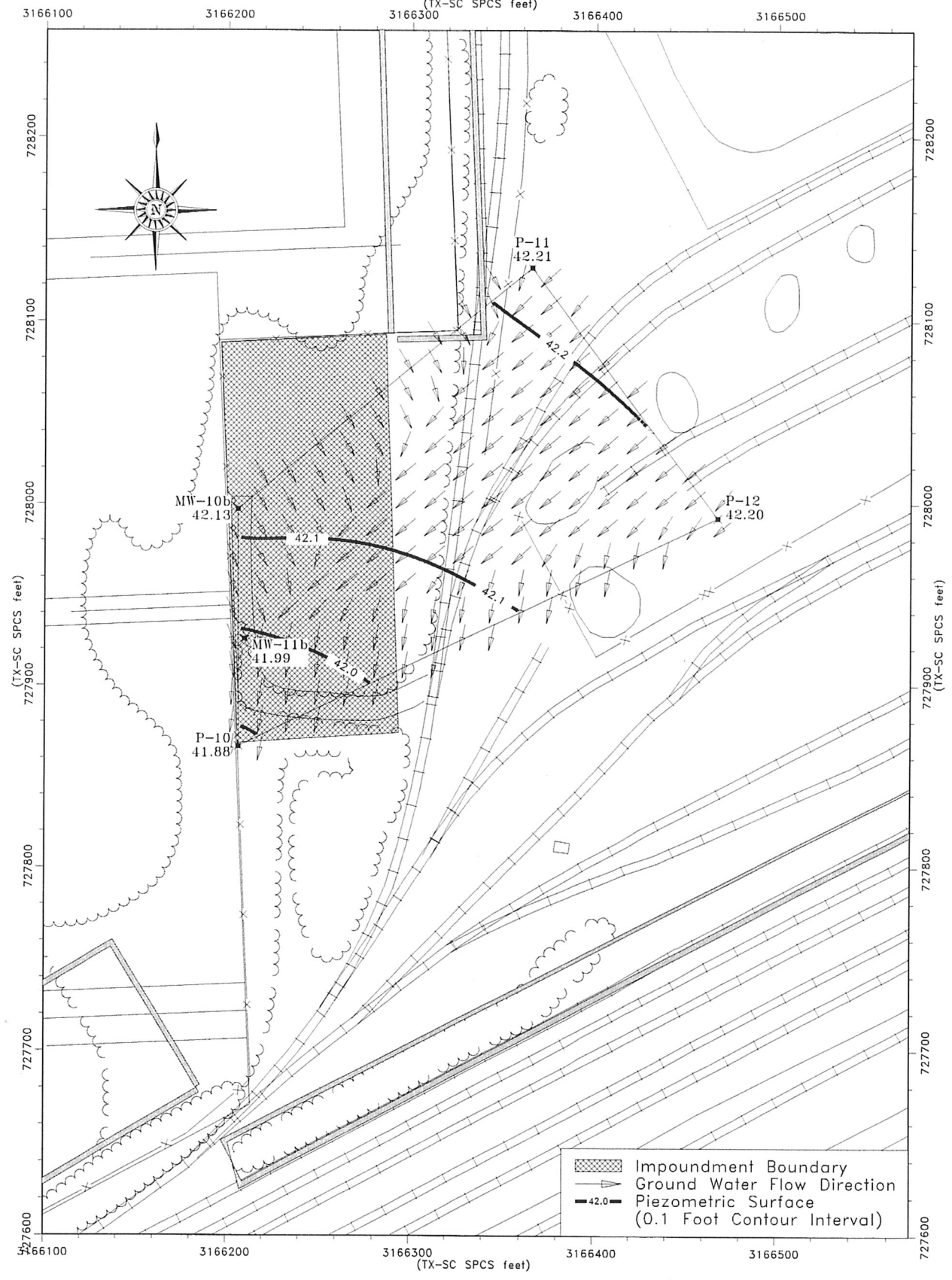


Figure 4. Piezometric Surface: Second Transmissive Zone; 01/23/96

# Interpretation of Naphthalene: Upper Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

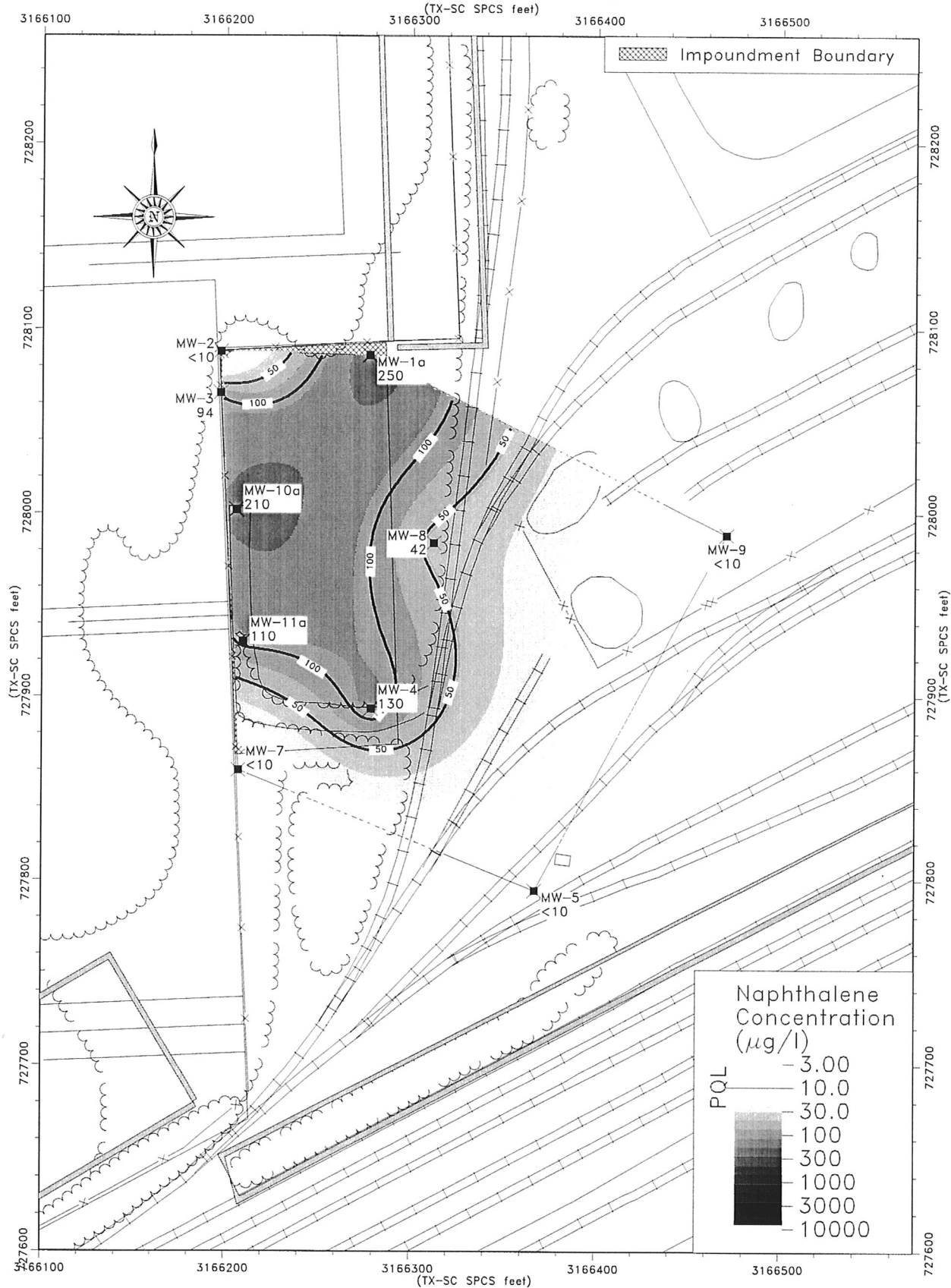


Figure 5. Interpretation of Naphthalene: Upper Transmissive Zone; 01/23/96

# Interpretation of Acenaphthene: Upper Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

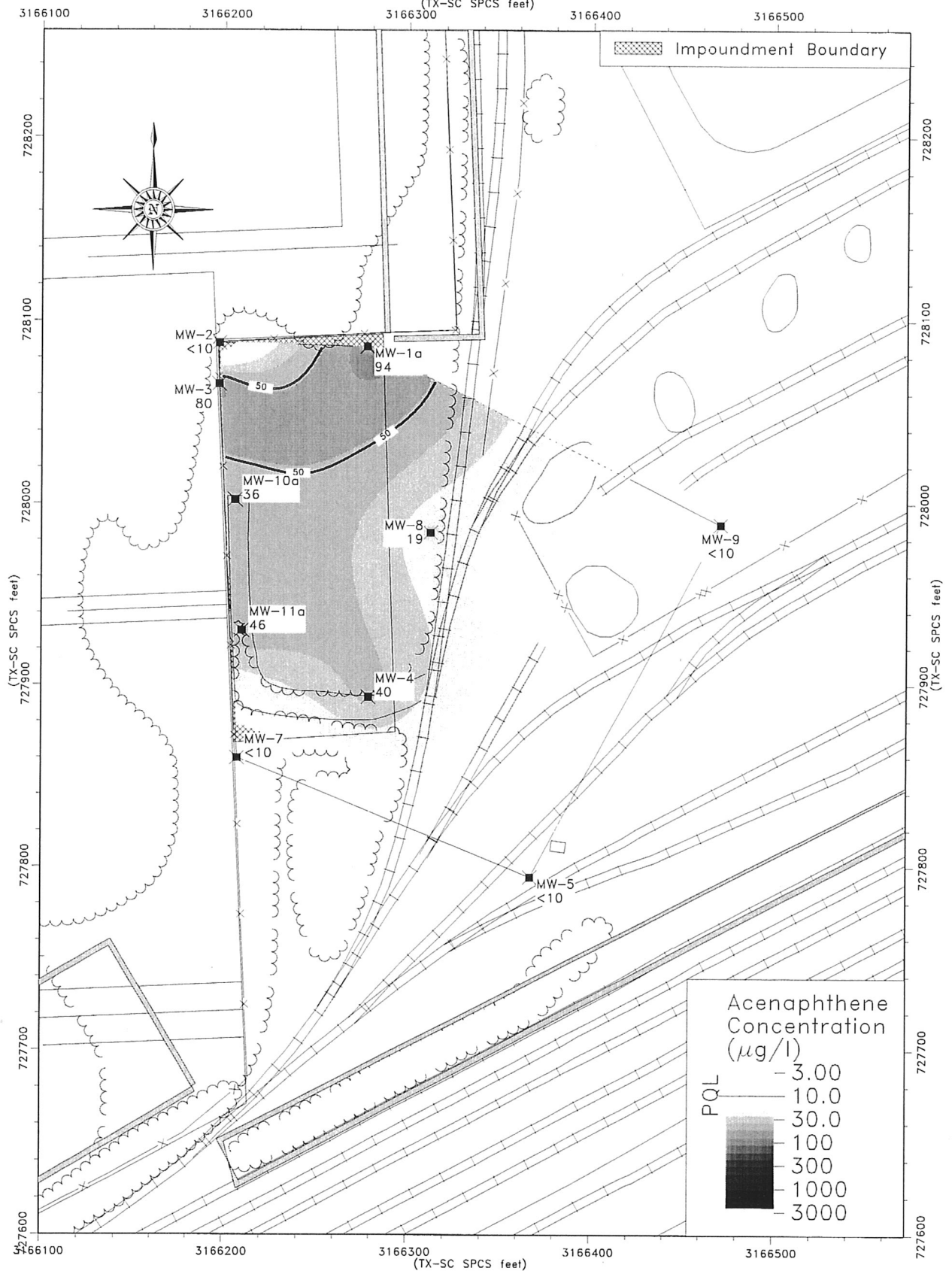


Figure 6. Interpretation of Acenaphthene: Upper Transmissive Zone; 01/23/96

# Interpretation of Total BTEX: Upper Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

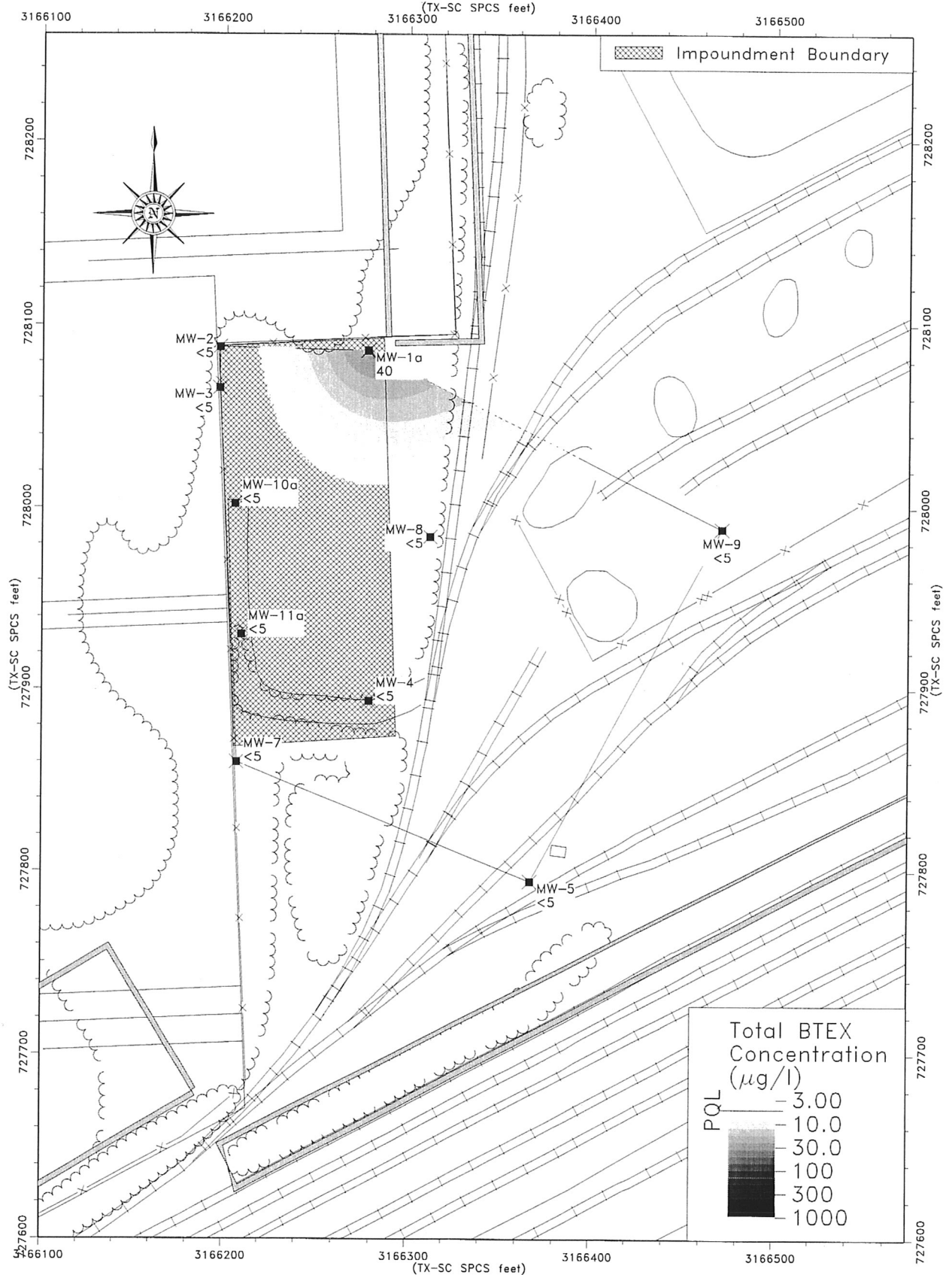


Figure 7. Interpretation of Total BTEX: Upper Transmissive Zone; 01/23/96

# Interpretation of Naphthalene: Second Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

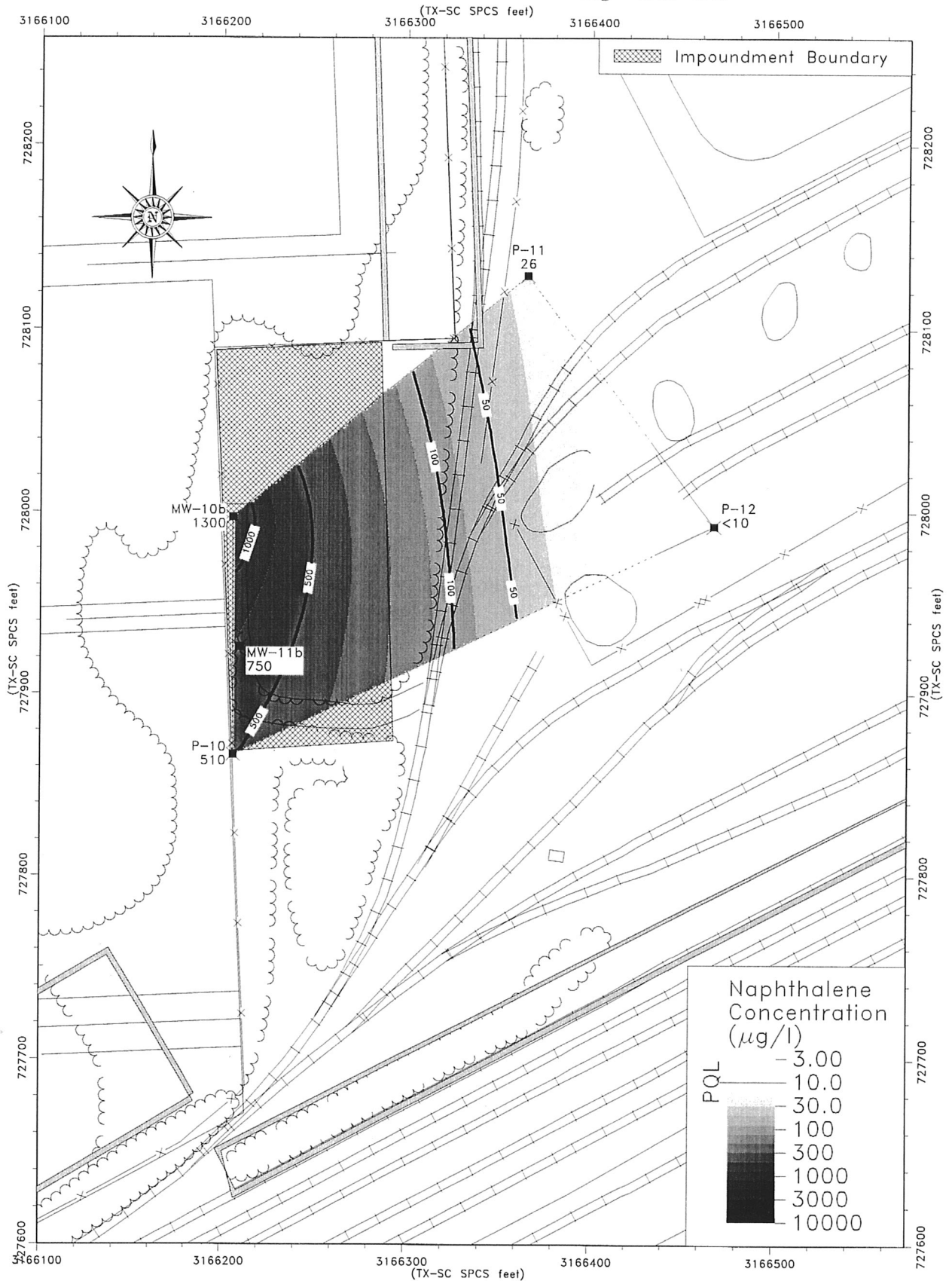


Figure 8. Interpretation of Naphthalene: Second Transmissive Zone; 01/23/96

# Interpretation of Acenaphthene: Second Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

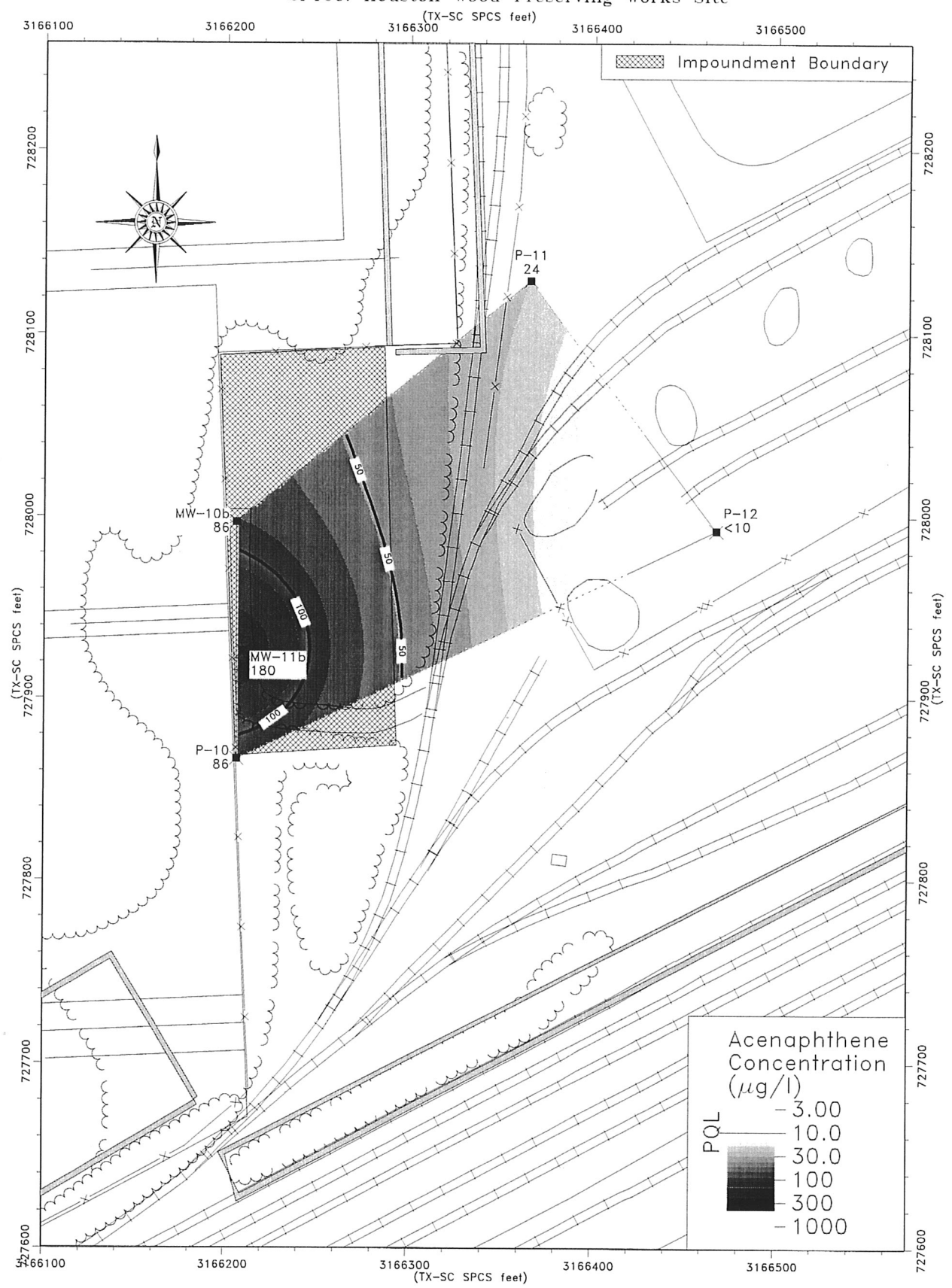


Figure 9. Interpretation of Acenaphthene: Second Transmissive Zone; 01/23/96



# Interpretation of Total BTEX: Second Transmissive Zone; 01/23/96

SPTCo: Houston Wood Preserving Works Site

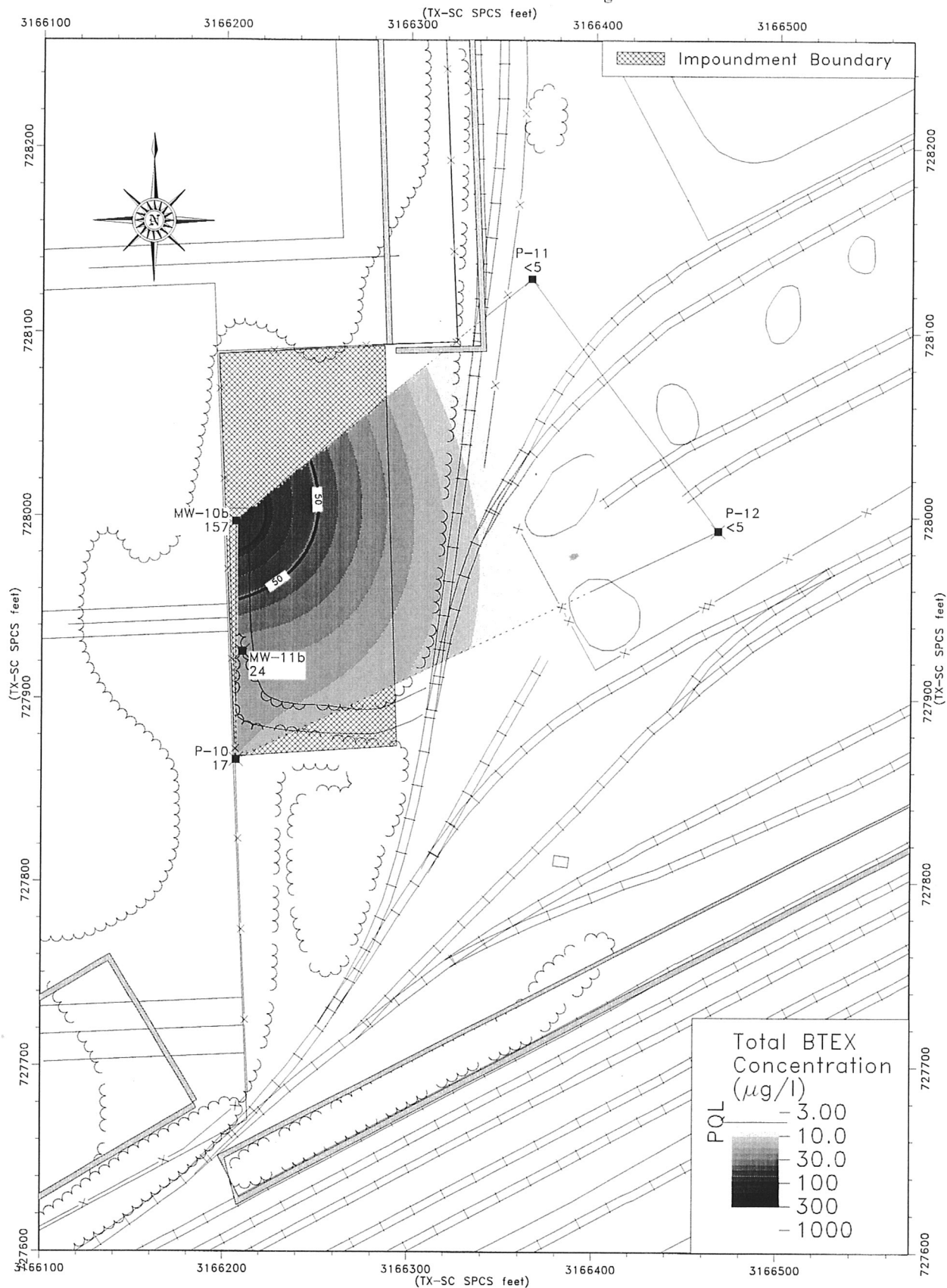


Figure 10. Interpretation of Total BTEX: Second Transmissive Zone; 01/23/96

TABLE 1  
SUMMARY OF ANALYTICAL RESULTS FOR UTZ  
(E1 +35-FOOT SAND ZONE) MONITOR WELLS  
First Semi-annual Period 1996

ANALYTICAL RESULTS (µg/L)										
COMPOUND	MW-1a	MW-2	MW-3	MW-4	MW-5	MW-7	MW-8	MW-9	MW-10a	MW-11a
BENZENE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
CHLOROBENZENE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
1,2-DICHLOROETHANE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
DICHLOROMETHANE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
ETHYLBENZENE	13	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
TOLUENE	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
XYLENES	27	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5
ACENAPHTHENE	94	ND<10	80	40	ND<10	ND<10	19	ND<10	36	46
ACENAPHTHYLENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
ANTHRACENE	10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BENZO(A)ANTHRACENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BENZO(A)PYRENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-ETHYLHEXYL)PHTHALATE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-CHLOROETHOXY)METHANE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
2-CHLORONAPHTHALENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
CHRYSENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
DIBENZOFURAN	52	ND<10	28	15	ND<10	ND<10	ND<10	ND<10	ND<10	20
2,4-DIMETHYLPHENOL	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
DI-N-BUTYL PHTHALATE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
4,6-DINITRO-O-CRESOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
2,4-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
2,6-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
1,2-DIPHENYLHYDRAZINE	ND<10	ND<10	96	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
FLUORANTHENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
FLUORENE	76	ND<10	85	20	ND<10	ND<10	18	ND<10	18	30
2-METHYLNAPHTHALENE	57	ND<10	ND<10	14	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
NAPHTHALENE	250	ND<10	94	130	ND<10	ND<10	42	ND<10	210	110
NITROBENZENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
4-NITROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
N-NITROSODIPHENYLAMINE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
PENTACHLOROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50
PHENANTHRENE	43	ND<10	16	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	13
PHENOL	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
PYRENE	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10

µg/L = micrograms per liter

ND = Not Detected at given detection limit

TABLE 2  
SUMMARY OF ANALYTICAL RESULTS FOR STZ  
(EI +15-FOOT SAND ZONE) MONITOR WELLS AND PIEZOMETERS  
First Semi-annual Period 1996

ANALYTICAL RESULTS (µg/L)					
COMPOUND	P-10	P-11	P-12	MW-10b	MW-11b
BENZENE	ND<5	ND<5	ND<5	ND<5	ND<5
CHLOROBENZENE	ND<5	ND<5	ND<5	ND<5	ND<5
1,2-DICHLOROETHANE	ND<5	ND<5	ND<5	ND<5	ND<5
DICHLOROMETHANE	ND<5	ND<5	ND<5	ND<5	ND<5
ETHYLBENZENE	11	ND<5	ND<5	46	12
TOLUENE	ND<5	ND<5	ND<5	13	ND<5
XYLENES	6	ND<5	ND<5	98	12
ACENAPHTHENE	86	24	ND<10	86	188
ACENAPHTHYLENE	ND<10	ND<10	ND<10	ND<10	ND<10
ANTHRACENE	11	ND<10	ND<10	10	22
BENZO(A)ANTHRACENE	ND<10	ND<10	ND<10	ND<10	ND<10
BENZO(A)PYRENE	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-ETHYLHEXYL)PHTHALATE	ND<10	ND<10	ND<10	ND<10	ND<10
BIS(2-CHLOROETHOXY)METHANE	ND<10	ND<10	ND<10	ND<10	ND<10
2-CHLORONAPHTHALENE	ND<10	ND<10	ND<10	ND<10	ND<10
CHRYSENE	ND<10	ND<10	ND<10	ND<10	ND<10
DIBENZOFURAN	13	ND<10	ND<10	57	59
2,4-DIMETHYLPHENOL	ND<10	ND<10	ND<10	ND<10	ND<10
DI-N-BUTYL PHTHALATE	ND<10	ND<10	ND<10	ND<10	ND<10
4,6-DINITRO-O-CRESOL	ND<50	ND<50	ND<50	ND<50	ND<50
2,4-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10
2,6-DINITROTOLUENE	ND<10	ND<10	ND<10	ND<10	ND<10
1,2-DIPHENYLHYDRAZINE	ND<10	ND<10	ND<10	ND<10	98
FLUORANTHENE	ND<10	ND<10	ND<10	ND<10	19
FLUORENE	90	ND<10	ND<10	60	140
2-METHYLNAPHTHALENE	38	ND<10	ND<10	87	43
NAPHTHALENE	510	26	ND<10	1300	750
NITROBENZENE	ND<10	ND<10	ND<10	ND<10	ND<10
4-NITROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50
N-NITROSODIPHENYLAMINE	ND<10	ND<10	ND<10	ND<10	ND<10
PENTACHLOROPHENOL	ND<50	ND<50	ND<50	ND<50	ND<50
PHENANTHRENE	37	ND<10	ND<10	46	160
PHENOL	ND<10	ND<10	ND<10	ND<10	ND<10
PYRENE	ND<10	ND<10	ND<10	ND<10	ND<10

µg/L = micrograms per liter

ND = Not Detected at given detection limit

TABLE 3  
WATER LEVEL ELEVATIONS  
FIRST SEMI-ANNUAL 1996

UTZ Well	Total Depth	*Reference Elevation	Depth to Water	Water Level Elevation
MW-1a	19.43	47.95	5.67	42.28
MW-2	18.39	48.03	5.69	42.34
MW-3	19.95	48.55	6.27	42.28
MW-4	22.59	49.85	7.85	42.00
MW-5	27.20	49.35	7.42	41.93
MW-7	24.56	48.86	6.99	41.87
MW-8	24.93	49.37	7.20	42.17
MW-9	25.22	49.29	7.09	42.20
MW-10a	25.38	49.90	7.74	42.16
MW-11a	23.79	50.04	8.01	42.03
STZ Well/ Piezometer	Total Depth	*Reference Elevation	Depth to Water	Water Level Elevation
MW-10b	46.35	49.97	7.84	42.13
MW-11b	46.52	50.19	8.20	41.99
P-10	42.70	47.72	5.84	41.88
P-11	42.61	49.02	6.81	42.21
P-12	42.73	48.82	6.62	42.20

\* - All depths and elevations measured in feet; depth relative to Reference Elevation and elevation relative to Mean Sea Level

UTZ Upper Transmissive Zone

STZ Second Transmissive Zone

**TABLE 4**  
**COMPLIANCE OF WELLS AND PIEZOMETERS**  
**WITH GROUND WATER PROTECTION STANDARD**

Monitoring Point	First Semi-annual Period	
	Compliant	Noncompliant
<b>UTZ Well</b>		
MW-1a		X
MW-2	X	
MW-3		X
MW-4		X
MW-5	X	
MW-7	X	
MW-8		X
MW-9	X	
MW-10a		X
MW-11a		X
<b>STZ Well/Piezometer</b>	<b>Compliant</b>	<b>Noncompliant</b>
MW-10b		X
MW-11b		X
P-10		X
P-11		X
P-12	X	

**APPENDIX A**

**DESIGNATION OF WELLS OF FUNCTION**

# DESIGNATION OF WELLS BY FUNCTION

Designated Function*	Zone Monitored	Well Number	Sampling Frequency
Point of Compliance	UTZ	MW-1 MW-2 MW-7 MW-10a MW-11a	Semi-annual
	STZ	MW-10b MW-11b	Semi-annual
Corrective Action Observation	UTZ	MW-4 MW-5 MW-7 MW-8 MW-9	Semi-annual
	STZ	P-10 P-11 P-12	Semi-annual

\* Background Wells are negated by the use of the Practical Quantitation Limit (PQL), unless the Compliance Plan is modified under CP Provision VI.A.



**APPENDIX B**

**FIELD TRACKING REPORT AND GROUND WATER SAMPLING FORMS**

**PROJECT NUMBER: 44102069**

**PROJECT NAME: Closed Surface Impoundment, 4910 Liberty Road in Houston, Texas**

**FIELD TRACKING REPORT: First Semi-annual Event 1996**

<b>FIELD SAMPLE CODE</b>	<b>BRIEF DESCRIPTION</b>	<b>DATE</b>	<b>TIME(S)</b>	<b>SAMPLER</b>
MW-1a	Water	1-23-96	1500	Miller
MW-2	Water	1-23-96	1440	Miller
MW-3	Water	1-23-96	1450	Miller
MW-4	Water	1-23-96	1515	Miller
MW-5	Water	1-24-96	0950	Miller
MW-7	Water	1-24-96	0930	Miller
MW-8	Water	1-24-96	1040	Miller
MW-9	Water	1-24-96	1135	Miller
MW-10a	Water	1-23-96	1426	Miller
MW-10b	Water	1-23-96	1615	Miller
MW-11a	Water	1-23-96	1355	Miller
MW-11b	Water	1-23-96	1545	Miller
P-10	Water	1-24-96	1055	Miller
P-11	Water	1-24-96	1210	Miller
P-12	Water	1-24-96	1140	Miller

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-1a**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1500

**Weather:** Cloudy, Windy, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 47.95'

**Depth to Water (From MP):** 5.67'

**Depth of Well (From MP):** 19.43'

**Volume of Water in Well:** 9.0 gallons

**Volume of Water Evacuated:** 27 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 23.0

**pH:** 6.63

**Specific Conductivity ( $\mu$ mhos/cm):** 1555

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421244

**Terranext**

**January 23, 1996**

[illegible]

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-2**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1440

**Weather:** Cloudy, Windy, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 48.03'

**Depth to Water (From MP):** 5.69'

**Depth of Well (From MP):** 18.39'

**Volume of Water in Well:** 2.10 gallons

**Volume of Water Evacuated:** 7.5 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 22.9

**pH:** 6.69

**Specific Conductivity ( $\mu$ mhos/cm):** 800

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421242

**Terranext**

**FIELD TESTING:  
WELL ID: MW-2  
January 23, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-23-96 1008	-	19.0	5.88	841
1-23-96 1014	2.5	20.0	5.51	842
1-23-96 1019	5.0	20.0	5.63	813
1-23-96 1024	7.5	21.0	5.58	823
1-23-96 1440	7.5	22.9	6.69	800

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-3**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1450

**Weather:** Cloudy, Windy, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 48.55'

**Depth to Water (From MP):** 6.27'

**Depth of Well (From MP):** 19.95'

**Volume of Water in Well:** 2.2 gallons

**Volume of Water Evacuated:** 7.5 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 22.5

**pH:** 6.72

**Specific Conductivity (μmhos/cm):** 1250

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421243

**Terranext**



**FIELD TESTING:  
WELL ID: MW-3  
January 23, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-23-96 1000	-	19.0	5.52	1225
1-23-96 1009	2.5	21.0	5.68	1288
1-23-96 1016	5.0	21.0	5.55	1249
1-23-96 1021	7.5	21.0	5.66	1239
1-23-96 1450	7.5	22.5	6.72	1250

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-4**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1515

**Weather:** Cloudy, Windy, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 49.85'

**Depth to Water (From MP):** 7.85'

**Depth of Well (From MP):** 22.59'

**Volume of Water in Well:** 2.4 gallons

**Volume of Water Evacuated:** 7.0 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 22.4

**pH:** 6.70

**Specific Conductivity ( $\mu$ mhos/cm):** 1050

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421247

**Terranext**

**FIELD TESTING:  
WELL ID: MW-4  
January 23, 1996**

[illegible]

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-5**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-24-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 0950

**Weather:** Clear, Calm, 58°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 49.35'

**Depth to Water (From MP):** 7.42'

**Depth of Well (From MP):** 27.20'

**Volume of Water in Well:** 3.22 gallons

**Volume of Water Evacuated:** 10.5 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 18.4

**pH:** 6.78

**Specific Conductivity ( $\mu$ mhos/cm):** 730

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421251

**Terranext**

**FIELD TESTING:  
WELL ID: MW-5  
January 24, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-24-96 0849	-	17.8	6.97	667
1-24-96 0856	3.5	20.1	6.80	723
1-24-96 0901	7	20.5	6.68	714
1-24-96 0906	10.5	20.1	6.68	755
1-24-96 0950	10.5	18.4	6.78	730

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-7**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-24-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 0930

**Weather:** Clear, Calm, 58°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 48.86'

**Depth to Water (From MP):** 6.99'

**Depth of Well (From MP):** 24.56'

**Volume of Water in Well:** 11.47 gallons

**Volume of Water Evacuated:** 47 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 20.6

**pH:** 6.57

**Specific Conductivity ( $\mu$ mhos/cm):** 985

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421248

**Terranext**

**FIELD TESTING:  
WELL ID: MW-7  
January 24, 1996**

[illegible]



**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-8**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-24-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1040

**Weather:** Clear, Calm, 58°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 49.37'

**Depth to Water (From MP):** 7.20'

**Depth of Well (From MP):** 24.93'

**Volume of Water in Well:** 11.60 gallons

**Volume of Water Evacuated:** 36 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 19.4

**pH:** 6.68

**Specific Conductivity ( $\mu$ mhos/cm):** 1142

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421252

**Terranext**

## FIELD TESTING:

**WELL ID: MW-8**

**January 24, 1996**

[illegible]

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-9**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-24-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1135

**Weather:** Clear, Calm, 58°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 49.29'

**Depth to Water (From MP):** 7.09'

**Depth of Well (From MP):** 25.22'

**Volume of Water in Well:** 11.8 gallons

**Volume of Water Evacuated:** 36 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 19.5

**pH:** 6.57

**Specific Conductivity ( $\mu$ mhos/cm):** 797

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421253

**Terranext**

**FIELD TESTING:  
WELL ID: MW-9  
January 24, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-24-96 0955	-	16.7	7.15	806
1-24-96 1003	12	21.2	6.73	864
1-24-96 1020	24	19.7	6.47	827
1-24-96 1029	36	19.4	6.36	833
1-24-96 1135	36	19.5	6.57	797

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-10a**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1426

**Weather:** Clear, Calm, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 49.90

**Depth to Water (From MP):** 7.74'

**Depth of Well (From MP):** 25.38'

**Volume of Water in Well:** 11.5 gallons

**Volume of Water Evacuated:** 36 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 21.8

**pH:** 6.82

**Specific Conductivity (μmhos/cm):** 1738

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421241

**Terranext**

**FIELD TESTING:  
WELL ID: MW-10a  
January 23, 1996**

TIME	WATER PURGED	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-23-96 0947	-	20.0	6.64	1617
1-23-96 0956	12	22.0	6.08	1613
1-23-96 1006	24	22.0	5.64	1566
1-23-96 1043	36	21.0	5.98	1578
1-23-96 1426	36	21.8	6.82	1738

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-10b**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1615

**Weather:** Clear, Calm, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 49.97'

**Depth to Water (From MP):** 7.84'

**Depth of Well (From MP):** 46.35'

**Volume of Water in Well:** 25.2 gallons

**Volume of Water Evacuated:** 77 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 23.3

**pH:** 6.67

**Specific Conductivity ( $\mu$ mhos/cm):** 1436

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421426

**Terranext**



**FIELD TESTING:  
WELL ID: MW-10b  
January 23, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-23-96 0925	-	20.0	6.58	1269
1-23-96 0943	25.5	21.0	6.45	1397
1-23-96 1258	51	22.3	6.82	1498
1-23-96 1343	77	23.1	6.80	1675
1-23-96 1615	77	23.3	6.67	1436

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-11a**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1355

**Weather:** Clear, Calm, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 50.04'

**Depth to Water (From MP):** 8.01'

**Depth of Well (From MP):** 23.79'

**Volume of Water in Well:** 10.3 gallons

**Volume of Water Evacuated:** 31.5 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 22.4

**pH:** 6.76

**Specific Conductivity (μmhos/cm):** 1340

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421240

**Terranext**

**FIELD TESTING:  
WELL ID: MW-11a  
January 23, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-23-96 0908	-	20.0	6.29	1320
1-23-96 0912	10.5	21.0	6.40	1360
1-23-96 0919	21	21.0	6.55	1300
1-23-96 0950	31.5	22.0	5.86	1272
1-23-96 1355	31.5	22.4	6.76	1340

**TERRANEXT  
GROUND WATER SAMPLING FORM  
WELL NUMBER: MW-11b**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-23-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1545

**Weather:** Clear, Calm, 67°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 50.19'

**Depth to Water (From MP):** 8.20'

**Depth of Well (From MP):** 46.52'

**Volume of Water in Well:** 25.0 gallons

**Volume of Water Evacuated:** 75 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 23.0

**pH:** 6.72

**Specific Conductivity ( $\mu$ mhos/cm):** 1393

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421245

**Terranext**

**FIELD TESTING:  
WELL ID: MW-11b  
January 23, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-23-96 0905	-	21.0	6.49	1175
1-23-96 0932	25	21.0	6.09	1258
1-23-96 1031	50	22.0	5.59	1179
1-23-96 1302	75	23.6	6.80	1236
1-23-96 1545	75	23.0	6.72	1393

**TERRANEXT  
GROUND WATER SAMPLING FORM  
PIEZOMETER NUMBER: P-10**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-24-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1055

**Weather:** Clear, Calm, 58°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 47.72'

**Depth to Water (From MP):** 5.84'

**Depth of Piezometer (From MP):** 42.70'

**Volume of Water in Piezometer:** 6.0 gallons

**Volume of Water Evacuated:** 18 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 18.4

**pH:** 6.63

**Specific Conductivity ( $\mu$ mhos/cm):** 1021

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421250

**Terranext**

**FIELD TESTING:  
PIEZOMETER ID: P-10  
January 24, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-24-96 0848	-	17.4	6.91	1066
1-24-96 0903	6	21.0	6.48	1194
1-24-96 0927	12	20.6	6.51	1177
1-24-96 0945	18	21.8	6.67	1224
1-24-96 1055	18	18.4	6.63	1021

**TERRANEXT  
GROUND WATER SAMPLING FORM  
PIEZOMETER NUMBER: P-11**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-24-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1210

**Weather:** Clear, Calm, 58°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 49.02'

**Depth to Water (From MP):** 6.81'

**Depth of Piezometer (From MP):** 42.61'

**Volume of Water in Piezometer:** 5.8 gallons

**Volume of Water Evacuated:** 18 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 21.0

**pH:** 6.48

**Specific Conductivity ( $\mu$ mhos/cm):** 1372

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421255

**Terranext**



**FIELD TESTING:  
PIEZOMETER ID: P-11  
January 24, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-24-96 1042	-	18.3	6.93	1251
1-24-96 1100	6	18.9	6.36	1402
1-24-96 1125	12	22.1	6.50	1386
1-24-96 1143	18	20.7	6.57	1582
1-24-96 1210	18	21.0	6.48	1372

**TERRANEXT  
GROUND WATER SAMPLING FORM  
PIEZOMETER NUMBER: P-12**

**Job Name:** First Semi-annual Sampling

**Job Number:** 44102069

**Client:** Southern Pacific Transportation Company

**Date Sampled:** 1-24-96

**Site Location:** 4910 Liberty Rd., Houston, Texas

**Time Sampled:** 1140

**Weather:** Clear, Calm, 58°F

**Sampled By:** Miller (T)

**EVACUATION DATA**

**Elevation of Measuring Point (MP):** 48.82'

**Depth to Water (From MP):** 6.62'

**Depth of Piezometer (From MP):** 42.73'

**Volume of Water in Piezometer:** 5.9 gallons

**Volume of Water Evacuated:** 18 gallons

**FIELD PARAMETERS FOLLOWING PURGING ACTIVITIES**

**Temp (°C):** 21.8

**pH:** 6.56

**Specific Conductivity ( $\mu$ mhos/cm):** 1498

**Purge Method:** Disposable Bailer

**Sampling Method:** Disposable Bailer

**Remarks:** Lab #H421254

**Terranext**

**FIELD TESTING:  
PIEZOMETER ID: P-12  
January 24, 1996**

TIME	WATER PURGED (gallons)	TEMP °C	pH	SPEC COND. (μmhos/cm)
1-24-96 0957	-	20.6	6.74	850
1-24-96 1018	6	20.3	6.46	1601
1-24-96 1030	12	20.1	6.45	1516
1-24-96 1045	18	21.3	6.43	1533
1-24-96 1140	18	21.8	6.56	1498

**APPENDIX C**

**POTENTIAL CONTAMINANTS OF CONCERN AND CONCENTRATION LIMITS  
FOR GROUND WATER PROTECTION STANDARD**

**POTENTIAL CONTAMINANTS OF CONCERN AND CONCENTRATION  
LIMITS FOR GROUND WATER PROTECTION STANDARD**

<b>Constituent of Concern</b>	<b>Detection Limits (mg/L)</b>
Acenaphthene	ND (0.010)
Acenaphthylene	ND (0.010)
Anthracene	ND (0.010)
Benzene	ND (0.005)
Benzo(A)anthracene	ND (0.010)
Benzo(A)pyrene	ND (0.010)
Bis(2-ethylhexyl)phthalate	ND (0.010)
Bis(2-chloroethoxy)methane	ND (0.010)
Chlorobenzene	ND (0.005)
2-Chloronaphthalene	ND (0.010)
Chrysene	ND (0.010)
Dibenzofuran	ND (0.010)
1,2-Dichloroethane	ND (0.005)
Dichloromethane (Methylene chloride)	ND (0.005)
2,4-Dimethylphenol	ND (0.010)
Di-n-butyl phthalate	ND (0.010)
4,6-Dinitro-o-cresol	ND (0.050)
2,4-Dinitrotoluene	ND (0.010)
2,6-Dinitrotoluene	ND (0.010)
1,2-Diphenylhydrazine	ND (0.010)
Ethylbenzene	ND (0.005)
Fluoranthene	ND (0.010)
Fluorene	ND (0.010)
2-Methylnaphthalene	ND (0.010)
Naphthalene	ND (0.010)
Nitrobenzene	ND (0.010)
4-Nitrophenol	ND (0.050)
N-Nitrosodiphenylamine	ND (0.010)
Pentachlorophenol	ND (0.050)

POTENTIAL CONTAMINANTS OF CONCERN AND CONCENTRATION  
LIMITS FOR GROUND WATER PROTECTION STANDARD

Constituent of Concern	Detection Limits (mg/L)
Phenanthrene	ND (0.010)
Phenol	ND (0.010)
Pyrene	ND (0.010)
Toluene	ND (0.005)
Xylenes	ND (0.005)

ND Nondetect at Practical Quantitation Limit (PQL) as determined by the analytical methods of the EPA publication SW-846, *Test Methods for Evaluating Solid Waste*, Third Edition, November 1986, and as listed in the July 8, 1987, edition of the *Federal Register* and later editions.

**APPENDIX D**  
**COMPLIANCE PLAN SCHEDULE**

# **COMBINED EOC/RFI SEMI-ANNUAL SCHEDULE REVISION**

ID	Task Name/Permit or CP Section No.	Duration	Start	Finish	Predec	Constraint Type
1	<b>SCHEDULE - COMPLIANCE PLAN/ CP XI. A.</b>	97d	6/21/94	11/3/94		As Soon As Possible
4						
5	<b>OPERATION &amp; MAINTENANCE PLAN/ CP XI. B.</b>	145d	6/21/94	1/10/95		As Soon As Possible
6	Submit to TNRCC	60ed	6/21/94	8/20/94		Must Finish On
7	TNRCC Review Period	73ed	8/22/94	11/3/94	6	As Soon As Possible
8	Revise O&M Plan	43ed	11/3/94	12/16/94	7	Must Finish On
9	Submit to TNRCC	0ed	12/16/94	12/16/94	8	Must Start On
10	TNRCC Review & Approval	17d	12/19/94	1/10/95	9	Must Finish On
11						
12	<b>P.O.C. WELL INSTALLATION/ CP XI. C.</b>	104d	7/22/94	12/14/94		As Soon As Possible
13	Notify TNRCC - 30 day advance	3d	7/22/94	7/26/94		Must Finish On
14	Install P.O.C. Wells	7d	9/12/94	9/20/94	13	Must Start On
15	Develop and Sample Wells	4d	9/21/94	9/26/94	14	As Soon As Possible
16	Submit Data Report to TNRCC	57d	9/27/94	12/14/94	15	Must Finish On
17						
18						
19	<b>EXTENT OF CONTAMINATION WORK PLAN/ VIII &amp; XI. D.</b>	335d	6/20/94	9/29/95		As Soon As Possible
20	Submit to TNRCC	67d	6/20/94	9/20/94		Must Finish On
21	TNRCC Review Period	111ed	9/21/94	1/10/95	20	As Soon As Possible
22	Revise EOC Work Plan	45ed	1/10/95	2/24/95	21	Must Finish On
23	Submit to TNRCC	0ed	2/24/95	2/24/95	22	Must Finish On
24	TNRCC Review Period	45ed	2/27/95	4/13/95	23	As Soon As Possible
25	Revise EOC Work Plan	30ed	4/13/95	5/13/95	24	As Soon As Possible
26	Submit to TNRCC	5ed	5/14/95	5/19/95	25	Must Finish On
27	TNRCC Approval	130ed	5/22/95	9/29/95	26	Must Finish On
28						
29	<b>RFI WORK PLAN DEVELOPMENT/ Permit VIII.</b>	347d	6/20/94	10/17/95		As Soon As Possible
30	Submit to TNRCC	87d	6/20/94	10/18/94		Must Finish On
31	TNRCC Review Period	362ed	10/19/94	10/16/95	30	Must Finish On
32	TNRCC Approval	1d	10/17/95	10/17/95	31	As Soon As Possible
33						
34						
35	<b>EOC IMPLEMENTATION - PHASE II/ CP VIII.</b>	288d	11/9/94	12/15/95		As Soon As Possible
36	Wetlands Assessment & Report Preparation	145d	11/9/94	5/30/95		Must Finish On
37	COE/TNRCC Approval & Access Authorization	60ed	5/31/95	7/30/95	36	As Soon As Possible
38	Initiation/Preparation for EOC Investigation	12ed	11/2/95	11/14/95	27	Must Finish On
39	CPT Soundings w/ROST real-time data	9d	11/14/95	11/24/95	38	Must Start On
40	Hydropunch Sampling & Analyses	11d	11/27/95	12/11/95	39	As Soon As Possible
41	Survey Sample Locations	4d	12/12/95	12/15/95	40	As Soon As Possible
42						
43	<b>RFI IMPLEMENTATION - PHASE I/ Permit VIII.E.</b>	27d	11/16/95	12/22/95		As Soon As Possible
44	CPT Soundings w/ROST real-time data	7d	11/16/95	11/24/95		Must Start On
45	Hydropunch Sampling & Analyses	18d	11/29/95	12/22/95	44	Must Start On
46	Surface Soil & Sediment Sampling & Analyses	15d	12/4/95	12/22/95	44	Must Start On
47	Survey Sample Locations	4d	12/12/95	12/15/95	40	As Soon As Possible
48						
49						
50	<b>RFI/EOC PHASE 1 INVESTIGATION REPORT</b>	181d	12/18/95	8/26/96		As Soon As Possible
51	Submit Phase 1 Assessment Report to TNRCC	115d	12/18/95	5/24/96	47	As Soon As Possible
52	TNRCC Review of Phase I Report	90ed	5/27/96	8/25/96	51	As Soon As Possible
53	TNRCC Approval of Phase 2 Scope of Work	1d	8/26/96	8/26/96	52	As Soon As Possible
54						
55						
56	<b>EOC &amp; RFI IMPLEMENTATION - PHASE 2/ CP VIII/P.VIII.E.</b>	109d	8/27/96	1/26/97		As Soon As Possible
57	Off-site access and permitting	30ed	8/27/96	9/26/96	53	As Soon As Possible
58	Soil Borings & Soil Samples	20ed	9/26/96	10/16/96	57	As Soon As Possible
59	Groundwater Monitor Well Installation	20ed	10/16/96	11/5/96	58	As Soon As Possible
60	Monitoring Well Development	5ed	11/5/96	11/10/96	59	As Soon As Possible
61	Monitoring Well Sampling - 1st Event	5d	11/11/96	11/15/96	60	As Soon As Possible
62	Slug Tests	3d	11/18/96	11/20/96	61	As Soon As Possible
63	Survey Monitoring Wells	1d	11/21/96	11/21/96	62	As Soon As Possible
64	Data Evaluation	25d	11/22/96	12/26/96	63	As Soon As Possible
65	30-day Follow-up Sampling (if necessary)	30ed	12/27/96	1/26/97	64	As Soon As Possible
66						
67						



# **COMBINED EOC/RFI SEMI-ANNUAL SCHEDULE REVISION**

ID	Task Name/Permit or CP Section No.	Duration	Start	Finish	Predec	Constraint Type
68	RFI/EOC PHASE 2 REPORT DEVELOPMENT/ VIII.I./VIII. E.	176d	1/27/97	9/29/97		As Soon As Possible
69	Submit Phase 2 RFI/EOC Report to TNRCC	90ed	1/27/97	4/27/97	65	Must Finish On
70	TNRCC Review of Report	90ed	4/28/97	7/27/97	69	As Soon As Possible
71	Respond to TNRCC Comments	30ed	7/28/97	8/27/97	70	As Soon As Possible
72	Submit (Final) Phase 2 Report to TNRCC	1d	8/27/97	8/27/97	71	As Soon As Possible
73	TNRCC Review	30ed	8/28/97	9/27/97	72	As Soon As Possible
74	TNRCC Approval	1d	9/29/97	9/29/97	73	As Soon As Possible
75						
76						
77	(EOC) CA STUDY WORK PLAN/ CP IX.	133d	10/28/97	4/30/98		As Soon As Possible
78	Prepare and Submit CA Study Work Plan	60ed	10/28/97	12/27/97	74	Must Finish On
79	TNRCC Review of Draft Work Plan	60ed	12/29/97	2/27/98	78	As Soon As Possible
80	Revise per TNRCC Review	30ed	2/27/98	3/29/98	79	As Soon As Possible
81	Submit Revised CA Work Plan to TNRCC	1ed	3/30/98	3/31/98	80	As Soon As Possible
82	TNRCC Review	30ed	3/31/98	4/30/98	81	As Soon As Possible
83	TNRCC Approval	1d	4/30/98	4/30/98	82	As Soon As Possible
84						
85						
86	(EOC) CORRECTIVE ACTION REPORT/ CP IX.E.	302d	5/1/98	6/29/99		As Soon As Possible
87	Pilot Studies/Field Tests	180ed	5/1/98	10/28/98	83	As Soon As Possible
88	Submit CA Report to TNRCC	120ed	10/28/98	2/25/99	87	As Soon As Possible
89	TNRCC Review of Draft Report	60ed	2/25/99	4/26/99	88	As Soon As Possible
90	Revise per TNRCC Review	30ed	4/26/99	5/26/99	89	As Soon As Possible
91	Submit Final CA Report to TNRCC	1ed	5/26/99	5/27/99	90	As Soon As Possible
92	TNRCC Review	30ed	5/27/99	6/26/99	91	As Soon As Possible
93	TNRCC Approval	1ed	6/28/99	6/29/99	92	As Soon As Possible
94						
95	(RFI) CORRECTIVE MEASURES STUDY/ Permit VIII.I.3.	286d	1/27/97	3/3/98		As Soon As Possible
96	Submit CMS with RFI Report (Option 1 - 120 days)	120ed	1/27/97	5/27/97	65	Must Finish On
97	TNRCC Review	90ed	5/27/97	8/25/97	96	As Soon As Possible
98	TNRCC Approval of RFI & CMS Report combined	1ed	8/25/97	8/26/97	97	As Soon As Possible
99						
100	Submit CMS separate from RFI Report (Option 2)	60ed	9/30/97	11/29/97	74	As Soon As Possible
101	TNRCC Review	90ed	12/1/97	3/1/98	100	As Soon As Possible
102	TNRCC Approval of CMS Report	1ed	3/2/98	3/3/98	101	As Soon As Possible
103						
104						
105	CA IMPLEMENTATION/ X.	268d	1/5/99	1/16/00		As Soon As Possible
106	Submit Engineering Plans as Permit Modification	90ed	1/5/99	4/5/99	93	Must Finish On
107	TNRCC Review of Plans	30ed	4/6/99	5/6/99	106	As Soon As Possible
108	Final Submission of Engineering Plans & Specs.	90ed	5/6/99	8/4/99	107	As Soon As Possible
109	TNRCC Review & Approval	30ed	8/4/99	9/3/99	108	As Soon As Possible
110	Construction/Installation	90ed	9/3/99	12/2/99	109	As Soon As Possible
111	System Start-up/Initial Operation/Permit Mon.	45ed	12/2/99	1/16/00	110	As Soon As Possible
112						
113	RFI/CMS CORRECTIVE ACTION	300ed	9/3/99	6/29/00	109	As Soon As Possible
114						
115						
116	GROUND WATER MONITORING/ VI. & Permit VII.B.	937d	6/20/94	1/20/98		As Soon As Possible
117						
118	Sample Existing & POC Wells	2ed	1/24/95	1/26/95		Must Start On
119	Report Submittal	58ed	1/26/95	3/25/95	118	As Soon As Possible
120						
121	Sample Existing & POC Wells	2ed	4/12/95	4/14/95		Must Start On
122	Report Submittal (2nd Qtr. 1995)	55ed	4/14/95	6/8/95	121	Must Finish On
123						
124	Sample Existing & POC Wells	2ed	7/11/95	7/13/95		Must Start On
125	Report Submittal (3rd Qtr. 1995)	25ed	7/14/95	8/8/95	124	Must Finish On
126						
127	Sample Existing & POC Wells	6ed	1/22/96	1/28/96		Start No Earlier Than
128	Report Submittal (1st semi-annual monitoring)	53ed	1/29/96	3/22/96	127	As Soon As Possible
129						
130	Sample Existing & POC Wells	6ed	9/16/96	9/22/96		Start No Earlier Than
131	Report Submittal (2nd semi-annual monitoring)	86d	9/23/96	1/20/97	130	Must Finish On
132						

### COMBINED EOC/RFI SEMI-ANNUAL SCHEDULE REVISION

ID	Task Name/Permit or CP Section No.	Duration	Start	Finish	Predec	Constraint Type
133	Sample Existing, POC and RFI Wells	6ed	1/23/97	1/29/97		Start No Earlier Than
134	Report Submittal (1st semi-annual monitoring 1997)	123d	1/29/97	7/18/97	133	As Soon As Possible
135						
136	Sample Existing, POC, and RFI Wells	6ed	7/21/97	7/27/97	134	As Soon As Possible
137	Report Submittal (2nd Semi-ann. monitoring 1997)	127d	7/28/97	1/20/98	136	As Soon As Possible
138						
139						
140	REPORTING 1996/1997	1d	6/20/94	6/20/94		As Soon As Possible
141	Semi-annual Report - January 21, 1996/ VII. B.2.	43d	11/21/95	1/20/96		As Soon As Possible
142	Submit Report to TNRCC	60ed	11/21/95	1/20/96		Must Finish On
143						
144	Annual Report - January 25, 1996 (Permit V.F. & III.B.1)	43d	11/25/95	1/24/96		As Soon As Possible
145	Submit Report to TNRCC	60ed	11/25/95	1/24/96		Must Finish On
146						
147	Semi-annual Report - July 21, 1996/ VII. B.2.	129d	1/23/96	7/20/96		As Soon As Possible
148	Submit Report to TNRCC	129d	1/23/96	7/20/96		Must Finish On
149						
150	Semi-annual Report - January 21, 1997/VII.B.2.	90d	9/17/96	1/20/97		As Soon As Possible
151	Submit Report to TNRCC	90d	9/17/96	1/20/97		Must Finish On
152						
153	Annual Report - January 25, 1997 (Permit V.F. & III.B.1)	60d	11/4/96	1/24/97		As Soon As Possible
154	Submit Report to TNRCC	60d	11/4/96	1/24/97		Must Finish On
155						
156	Semi-annual Report - July 21, 1997/VII.B.2.	127d	1/23/97	7/18/97		As Soon As Possible
157	Submit Report to TNRCC	127d	1/23/97	7/18/97		Must Finish On

**APPENDIX E**

**INDICATOR PARAMETERS AND CONCENTRATION LIMITS FOR GROUND WATER  
PROTECTION STANDARD**

**INDICATOR PARAMETERS AND CONCENTRATION  
LIMITS FOR GROUND WATER PROTECTION STANDARD**

<b>Indicator Parameter</b>	<b>Detection Limits (mg/L)</b>
Acenaphthene	ND (0.010)
Anthracene	ND (0.010)
Benzene	ND (0.005)
Bis(2-ethylhexyl)phthalate	ND (0.010)
Dibenzofuran	ND (0.010)
Dichloromethane (Methylene chloride)	ND (0.005)
2,4-Dimethylphenol	ND (0.010)
4,6-Dinitro-o-cresol	ND (0.050)
Ethylbenzene	ND (0.005)
Fluoranthene	ND (0.010)
Fluorene	ND (0.010)
2-Methylnaphthalene	ND (0.010)
Naphthalene	ND (0.010)
Phenanthrene	ND (0.010)
Pyrene	ND (0.010)
Toluene	ND (0.005)
Xylenes	ND (0.005)

ND Nondetect at Practical Quantitation Limit (PQL) as determined by the analytical methods of the EPA publication SW-846, *Test Methods for Evaluating Solid Waste*, Third Edition, November 1986, and as listed in the July 8, 1987, edition of the *Federal Register* and later editions.